

Education and Gender Equality Are Inconsistently Associated with HIV Testing in Eastern Africa

In a study that assessed education, gender equality and HIV testing in nationally representative samples of married or cohabiting women in Kenya, Zambia and Zimbabwe, 15–24-year-olds had an elevated likelihood of having ever had an HIV test or having had one in the past year if they had at least some secondary education (odds ratios, 1.8–3.4), but their role in making household financial decisions and attitude toward wife beating were not related to testing.¹ Among women aged 25–34, education was not consistently related to HIV testing, but the belief that wife beating is never justified was associated with having had an HIV test in the past year for those living in Kenya and Zambia (1.3 for each), and involvement in financial decision making was associated with a history of testing in Zimbabwe (1.7).

Although reducing gender inequality and promoting females' education have been cited as potentially useful strategies for preventing HIV, studies have not consistently linked levels of inequality and education to receipt of HIV prevention and treatment services, and none has examined both characteristics. The present study simultaneously assessed the relationship between these variables and testing by analyzing Demographic and Health Survey data from Kenya (2008–2009), Zambia (2007) and Zimbabwe (2005–2006), where national HIV prevalence is high (6%, 14% and 18%, respectively), and rates of HIV testing among women aged 15–49 are relatively low (58%, 40% and 26%, respectively). Analyses focused on married or cohabiting females aged 15–34; because gender inequality may influence HIV testing differentially by age, the samples were stratified into two age-groups (15–24 and 25–34). Weighted samples consisted of 3,221 respondents in Kenya, 3,049 in Zambia and 3,706 in Zimbabwe. The main outcome measures were having ever been tested for HIV and having been tested in the past year; the two gender equality variables were financial decision making (i.e., “Who usually decides how your husband’s/partner’s earnings will be used?”) and whether respondents

believed that a husband is justified in hitting or beating his wife in five different scenarios (e.g., if she goes out without telling him, argues with him or refuses to have sex). Multivariate logistic regression analysis was used to identify associations between HIV testing and measures of respondents' gender equality and background characteristics.

Women in Kenya and Zambia had similar education levels, as only a fifth to a third of those in the 15–24 and 25–34 age-groups had at least some secondary education; in contrast, two-thirds of all respondents in Zimbabwe had some secondary schooling. Most women in the younger cohorts had given birth (79–86%), and nearly all of those in the older groups had had a child (97–98%). A majority of respondents lived in rural areas (64–75%), and fewer than one in 10 reported having had an STI in the last year. There was little difference in rates of HIV testing between age-groups in any country: In Kenya, 78–79% of females had ever been tested and 40–43% had been tested in the past year; in Zambia, 46–47% and 25%, respectively, had been tested in these time periods; and in Zimbabwe, 34–37% and 9–11%, respectively, reported such testing. In all three countries, a majority of females in each cohort said they made household financial decisions either jointly or alone (57–62% in Kenya and Zambia; 83–84% in Zimbabwe), and large proportions believed that wife beating was never acceptable (42–49%, 35–39% and 48–59%, respectively).

Regression analysis revealed that associations between HIV testing and education or gender inequality differed by age-group. Among 15–24-year-olds, education was consistently associated with HIV testing in all three study nations: Females who had at least some secondary education were more likely than those with less education to have ever been tested (odds ratios, 1.9–3.4) or to have been tested in the past year (1.8–3.3). Respondents from each country who had ever given birth had elevated odds of having ever been tested (2.3–3.1), as did those from Ken-

ya and Zambia who were in the top three wealth quintiles (2.0–3.8). Notably, in this younger age-group, no association was found between lifetime or past-year HIV testing and either financial decision making or attitude toward wife beating.

A different pattern emerged among 25–34-year-olds. Education was related to HIV testing in only two cases: Women with at least some secondary education had an increased likelihood of having ever been tested in Zimbabwe (odds ratio, 1.5), and of having been tested in the last year in Kenya (1.5). In addition, several associations between gender inequality and HIV testing emerged. Kenyan respondents in the older cohort who believed wife beating was never justified were more likely than others to report HIV testing in either period (1.3–1.6), and their Zambian counterparts were more likely to report testing in the past year (1.3). Moreover, Zimbabwean 25–34-year-olds who made financial decisions jointly or alone had increased odds of having ever had an HIV test (1.7). Women who had ever given birth had an elevated likelihood of reporting HIV testing in either period in Kenya and Zambia (4.5–5.3). Interestingly, women's perception of HIV risk was related to testing only in Zimbabwe, where respondents who reported low or medium risk were less likely than those who thought they had no risk to report lifetime or past-year HIV testing (0.4–0.7).

The researchers note that their use of cross-sectional data did not allow them to establish causal relationships between the gender equality measures and HIV testing. However, they point out that women's knowledge of their HIV status is a critical step in gaining access to treatment, and they argue that efforts to promote gender equality are important in achieving such access and reducing levels of HIV infection. Furthermore, the investigators suggest that “efforts must be taken ... to ensure that women have a voice in how family resources are used,” and that community-level programs to improve norms regarding intimate partner violence “can play a crucial

role in efforts to protect women and girls from HIV.”—*J. Thomas*

REFERENCE

1. Singh K, Luseno W and Haney E, Gender equality and education: increasing the uptake of HIV testing among married women in Kenya, Zambia and Zimbabwe, *AIDS Care*, 2013, doi:10.1080/09540121.2013.774311.

Youth, Poverty Linked To Unsafe Abortion Among Women in Ghana

Many Ghanaian women, particularly those who are young or poor, continue to obtain unsafe, illegal abortions, despite Ghana's relatively moderate abortion law, a nationally representative study indicates.¹ About one in 10 women surveyed in 2007 said they had had an abortion in the past five years, and only slightly more than half of their procedures had been safe (55%). The odds that an abortion had been done safely were lower among women who were younger than 30 than among older women (odds ratios, 0.2–0.4), and greater among women in the two highest wealth quintiles than among poorer women (1.8–2.9). Women whose partner had paid at least partially for the procedure also had elevated odds of obtaining a safe abortion (3.1).

Since 1985, abortion has been legal in Ghana if a pregnancy is the result of rape or incest, threatens the woman's life or her physical or mental health, or would result in a child with a serious physical abnormality. However, few women seek legal abortions, not only because of the attendant stigma but also because many are unable to afford services or are unaware that the procedure is legal. To assess the relationship between women's characteristics and the legality and safety of their abortions, the investigators examined data from the 2007 Ghana Maternal Health Survey, conducted among women aged 15–49.

The analytic sample consisted of 5,747 women who had been pregnant in the five years prior to the survey, including 552 women who had had an abortion during this time period. Women were asked to provide information on their demographic and socioeconomic characteristics, access to media, awareness of abortion's legal status, and previous pregnancies, births and abortions. If they had had an abortion, they were asked about the type of provider, location and method used.

The researchers used logistic regression to identify characteristics associated with having obtained any abortion and with having obtained a safe procedure.

Almost all respondents were aged 20 or older (95%), had at least one child (94%) and were currently or formerly married (91%). Three-quarters were Christian, and six in 10 resided in a rural area. Half of women had little or no access to newspapers, radio or television, and just 3% knew that abortion is legal.

Compared with women in the full sample, those who had had an abortion were more likely to be young, childless and unmarried. More than one-fourth of abortion recipients were younger than 20, two in five were childless and four in 10 had never been married. Ninety percent were Christian, 41% lived in a rural region and only 35% belonged to one of the lowest three wealth quintiles. As in the main sample, the proportion who knew abortion's legal status was extremely small (6%).

Regression analysis revealed that women were more likely to have had an abortion in the past five years if they were in their 20s than if they were older (odds ratio, 1.8), if they were childless than if they had at least three children (7.0), if they were in the two highest wealth quintiles than in the three poorest ones (1.7–1.8) and if they practiced some form of Christianity rather than Islam (1.9–3.5). The odds of having had an abortion were also elevated among women who had never married (2.3), had had a previous abortion (2.1) or were urban residents (1.4).

Slightly more than half (55%) of the women who had had an abortion had had a safe procedure—that is, it had been a surgical or medication abortion performed by a doctor, nurse or midwife, even if it had occurred outside of a clinic or hospital. Additional regression analyses revealed that teenagers and women in their 20s were less likely than older women to have had a safe abortion (odds ratios, 0.2–0.4). The odds of having obtained a safe procedure were greater among women in the wealthiest and second wealthiest quintiles than among those in the poorest three quintiles (odds ratios, 2.9 and 1.8, respectively), and greater among women whose partner contributed toward the procedure's costs than among those whose partner had not helped pay for the abortion (odds ratios, 3.1). Neither knowledge of abortion's legality nor access to media was associated with abortion safety.

The researchers point out several limita-

tions of the study, including the likelihood of underreporting because of stigma and incorrect recall; on the basis of regional data on abortion incidence in West Africa, they estimate that only about 40% of abortions were reported in the Ghana survey, though their analyses suggest that underreporting did not vary by subgroup. In addition, the study examined abortions that had occurred in the past five years, during which time women's socioeconomic characteristics (which were assessed at the time of the survey) may have changed to some degree. Nonetheless, in addition to underscoring the need for programs aimed at reducing stigma and improving women's knowledge of and access to legal abortion, especially in poor or rural areas, the researchers recommend greater involvement of partners; outreach efforts to men should emphasize “the importance of their support and ... the dangers of unsafe abortions.” Future research, they suggest, should examine the national incidence of unsafe abortion and evaluate the success of ongoing programs designed to address this issue.—*S. Ramashwar*

REFERENCE

1. Sundaram A et al., Factors associated with abortion-seeking and obtaining a safe abortion in Ghana, *Studies in Family Planning*, 2012, 43(4):273–286.

In Malawi, Polygamy Is Associated with Reduced Contraceptive Use

In Malawi, women in polygamous marriages are less likely than their counterparts in monogamous marriages to use modern contraceptives, surveillance data from more than 2,500 couples indicate.¹ The proportion of women who wanted to stop childbearing was higher among those in polygamous marriages than among those in monogamous unions (54% vs. 40%), although the difference was not significant after adjustment for age and parity. Nonetheless, the odds of contraceptive use were substantially lower among women in polygamous marriages than among those in monogamous ones (odds ratio, 0.7). Moreover, when partners had conflicting fertility desires, the associated decrease in the odds of contraceptive use was larger among men and women in polygamous marriages (0.4–0.5) than among those in monogamous unions (0.6–0.7).

More than 20% of married women in West

and East Africa are in polygamous relationships. Although studies have examined fertility desires and contraceptive use in such marriages, they have not taken into account differences that may exist among the co-wives in these unions. For example, one co-wife may desire a future birth, but another may not; similarly, a husband may want to have another child, but only with a specific wife. To explore whether wife-specific fertility preferences and contraceptive use in polygamous marriages differ from those in monogamous marriages, researchers analysed data collected from a demographic surveillance site in Karonga district, Malawi. Although Karonga is the most rural region in Malawi, it has the country's highest literacy rates; nearly all residents are Christian, and about a quarter of women live in polygamous relationships.

In 2008–2009, a survey module on fertility intentions was added to ongoing surveillance efforts in Karonga. Husbands and wives were asked about their demographic characteristics, fertility history, fertility desires, perceptions of spousal fertility desires and contraceptive use; men in polygamous marriages answered these questions separately for each wife. A total of 2,636 confirmed couples completed the module; the current analyses were restricted to the 2,243 couples in which the wife was aged 18–49 and was not pregnant. The researchers compiled descriptive statistics and performed bivariate and logistic regression analyses to compare outcomes by type of marriage.

Overall, 78% of the wives were in monogamous marriages and 22% were in polygamous ones; nearly a quarter of those in polygamous relationships had more than one co-wife. Compared with wives in monogamous marriages, those in polygamous unions were older (32 vs. 29 years), had been married longer (12 vs. 10 years), were more likely to have been previously married (32% vs. 16%), had a greater number of living children (3.5 vs. 3.3), were more likely to have had a child who died (36% vs. 27%) and were less likely to have at least a secondary education (13% vs. 21%). Similar differences in age, parity and education were observed by marriage type among husbands.

The proportion of respondents who wanted to stop childbearing was higher in polygamous marriages than in monogamous unions, among both wives (54% vs. 40%) and husbands (54% vs. 38%). Similarly, both partners reported wanting to stop childbearing in

37% of polygamous husband-wife pairs, but in only 27% of monogamous pairs. None of these differences were significant, however, after adjustment for the older age and higher parity of polygamous respondents. Men and women in polygamous marriages were more likely than those in monogamous unions to think that their fertility preference matched that of their spouse; in reality, agreement in fertility desires was lower among polygamous couples than among monogamous ones.

The prevalence of contraceptive use was lower among respondents in polygamous marriages than among those in monogamous marriages, according to both wives (35% vs. 44%) and husbands (38% vs. 47%); the findings did not change after adjustment for whether couples had had sex in the past three months. Clandestine contraceptive use appeared to be greater in polygamous than in monogamous marriages; among husband-wife pairs in which the wife reported contraceptive use, 71% of monogamous husbands, but only 59% of polygamous husbands, also reported use.

Logistic regression analyses confirmed that polygamous respondents were less likely than monogamous ones to be using a modern method of contraception, according to wives' reports (odds ratio, 0.7). Although the odds of contraceptive use were lower among couples in which only one spouse wanted to stop childbearing than among those in which both partners wanted to stop, the results did not differ substantially according to the sex of the partner who wanted to stop. However, the odds of use were reduced to a greater extent when polygamous women and men disagreed about continued childbearing (0.4–0.5) than when monogamous partners disagreed (0.6–0.7). Among polygamous couples, monogamous couples or both, contraceptive use was negatively associated with age and positively associated with level of education and number of living children. If the husband had HIV, monogamous couples were more likely to practice contraception (1.5), whereas polygamous couples were less likely to do so (0.4).

The findings, according to the researchers, suggest that although polygamous couples are at least as likely as monogamous couples to want to stop childbearing, "the translation of preferences into behaviour is less strong in [these] couples, leading to a lower use of contraception." While the study was not designed to elucidate the reasons for this, the investigators speculate that the ability of women in po-

lygamous marriages to share responsibilities (including child care) with their co-wives softens the impact of having an unplanned birth, and thus may reduce women's motivation to practice contraception.—P. Doskoch

REFERENCE

1. Baschieri A et al., Reproductive preferences and contraceptive use: a comparison of monogamous and polygamous couples in northern Malawi, *Journal of Biosocial Science*, 2013, 45(2):145–165.

Having HIV Linked To Reduced Fertility Desires in Uganda

HIV-positive women are less likely than their uninfected peers to want to have a child in the future, according to a study conducted in Mbarara, Uganda.¹ Although almost all of the HIV-positive women in the clinic-based sample were receiving antiretroviral therapy, only 28% wished to have a child, compared with 56% of HIV-negative women. Even after adjustment for marital status and other characteristics, the odds that an HIV-positive woman desired a child were half those of an uninfected woman (odds ratio, 0.5). In addition, fertility desires were positively associated with income, and negatively associated with age, parity, having a son and having a foster child in the household.

Studies conducted in Sub-Saharan Africa in the 1990s and early 2000s generally found that HIV-infected individuals wanted fewer children than did their uninfected peers—and often wanted to cease childbearing altogether. However, more recent research has yielded mixed results. In some studies, the prospect or availability of antiretroviral therapy has led to renewed interest in childbearing (and in one study, an actual increase in pregnancy among infected women); in others, fertility intentions remained low among infected individuals. The current study examined these issues in Uganda, where the proportion of adults infected with HIV has fallen dramatically but remains substantial (6% in 2009), fertility levels are among the highest in the world (6.7 children per woman in 2006) and antiretroviral therapy is widely available.

In 2010, researchers surveyed 1,594 women who were being treated at a regional hospital in Mbarara. Women were recruited from the hospital's general outpatient clinic, which serves patients with nonacute con-

ditions, and from its immune suppression clinic, which treats patients with HIV, to yield similar proportions of HIV-negative and HIV-positive women. Women were eligible for the study if they were aged 18–49 and had ever had an HIV test; they were asked about their demographic characteristics, reproductive history, fertility desires, contraceptive use and attitudes toward HIV. The authors used multivariate logistic regression to assess the relationship between women's HIV status and their fertility desires.

Overall, 60% of the women were HIV-positive; 96% of infected women were taking antiretroviral therapy. Sixty-eight percent of HIV-positive women, but only 3% of HIV-negative women, reported that their husband had HIV. Compared with uninfected women, those with HIV were older (33 vs. 28 years, on average) and less likely to have more than a primary education (25% vs. 47%) and to be married or living as if married (54% vs. 82%). Although HIV-positive women had had one more child, on average, than other women had (3.4 vs. 2.5), the difference was not significant after adjustment for women's age.

Among the 1,039 women who were married or in other stable unions, only 28% of those who were HIV-positive wished to have another child, compared with 56% of those who did not have the virus. The proportion of women whose partner wanted a child in the future was also smaller among infected than among uninfected women (34% vs. 57%). Regardless of their HIV status, substantial proportions of women had fertility desires concordant with those of their partner. About one in four married women were pregnant; those with HIV were more likely than those without to say that the pregnancy was a “big problem” (37% vs. 11%).

Logistic regression revealed that the odds that an HIV-positive woman wanted another child were about half those of an uninfected woman (odds ratio, 0.5). Women's fertility desires declined with increasing parity (0.5 per child) and were lower among those who were caring for a foster child than among other women (0.6). In addition, the desire for a child was negatively associated with age and positively associated with household income.

To assess whether a desire for sons was related to childbearing intentions, the researchers calculated a second regression model that replaced the parity measure with a variable indicating whether the woman had any sons. Women with a son were far less likely than

those without a son to want a child in the future (0.3); the substitution strengthened the association of childbearing intentions with age but weakened the association with income.

The researchers note that these and other recent findings, together with historical data, suggest that although fertility desires in Sub-Saharan Africa fell during the early years of the HIV epidemic and then rebounded as antiretroviral therapy became widespread, they remain lower among HIV-infected women than among uninfected women, particularly in countries that have been hit hard by AIDS (such as Uganda and South Africa). One of the new study's limitations, the researchers add, is its lack of information on the reasons for infected women's reluctance to have children. However, the potential challenge of caring for a child when the woman herself has HIV, as well as the fact that HIV-positive women are more likely than other women to have a low income, to be unmarried, to have an infected spouse and to be caring for a foster child, not only may help explain the disparity in fertility intentions but also may underscore the “numerous and continuing social needs” of women with HIV.—*P. Doskoch*

REFERENCE

1. Snow RC et al., The social legacy of AIDS: fertility aspirations among HIV-affected women in Uganda, *American Journal of Public Health*, 2013, 103(2): 278–285.

Cost-Effectiveness of HIV Messages Varies By Medium in Benin

In a 2009 cost-effectiveness analysis of various behavior change communication (BCC) methods directed at the prevention of HIV transmission among youths, truck drivers and sex workers in Benin, the most cost-effective methods of promoting consistent condom use were disseminating safer-sex messages via magazines, radio broadcasts and public outreach events (approximately US\$22, \$25 and \$31, respectively, per consistent user).¹ Individuals with high exposure to messages through each of these three methods were more likely than those with little or no exposure to report consistent condom use (odds ratios, 1.4–1.9). Two other methods—billboards and peer education—not only had high per-person dissemination costs, but were not associated with increased condom

use among exposed respondents (and hence were not cost-effective) in this setting.

To address the general lack of economic evaluations of BCC methods in interventions to prevent HIV transmission, this study assessed the costs of five methods and their cost-effectiveness at promoting consistent condom use. Understanding the effectiveness of interventions is particularly needed in low- and middle-income countries, as well as among populations with low HIV awareness and high levels of risky sexual behavior. Although the HIV prevalence in Benin is relatively low (2%), in the last decade the proportion of adults who are infected has increased 12-fold. In 2007–2009, as part of the country's National Framework to Fight HIV/AIDS, Population Services International implemented interventions to promote safer sexual behavior and consistent condom use.

An analysis estimated the economic costs of implementing the programs; implementation expenditures were collected for 2009, and start-up and capital costs incurred in earlier years were annualized and converted to 2009 prices. To assess the cost-effectiveness of methods, 5,451 randomly selected individuals at risk of HIV infection—youths (aged 15–24), truck drivers (15 or older) and sex workers (aged 15–29)—were asked if they had heard messages about how to prevent HIV in the last 12 months, and if so, where they had heard them; depending on how many times respondents had been exposed to each type of communication, they were classified into low- (≤ 1), medium- (2–3) and high-exposure (≥ 4) groups. Respondents were then asked whether they had consistently used condoms with recent partners (for sex workers, with all partners in the last week; for truck drivers, with all casual partners and sex workers in the last month; and for youth, with all casual partners in the last year). For each medium, the impact of BCC messages was estimated by calculating the odds that someone with high exposure reported consistent condom use relative to someone with little or no exposure; cost-effectiveness ratios were then calculated per high-exposure individual reporting consistent condom use.

The economic cost for all BCC interventions was nearly US\$800,000 in 2009. The costliest intervention was peer education (one-to-one and small-group discussions), followed closely by radio broadcasts (30-second messages and talk shows) and public outreach events (e.g., theatrical sketches and

condom demonstrations); the least costly interventions were messages conveyed via youth-oriented magazines and billboards. Overall, personnel expenses accounted for 64% of the annual cost of the interventions, while recurrent contracted services and supplies made up 8% and 7%, respectively; the remaining costs were capital and operation expenditures. The numbers of individuals reached by each method over the year varied widely: About 2,600 viewed billboards, 5,000 participated in peer education, 8,000 were exposed to messages in magazines, 43,000 heard radio broadcasts and 82,000 attended public outreach events. The cost to reach each person also varied by method, from just over US\$2 for public outreach and \$4.50 for radio to \$18 for magazines, \$25 for billboards and \$39 for peer education.

In an analysis assessing the likelihood that exposure to a given method was associated with reporting consistent condom use, individuals with high exposure to HIV messages in magazines were more likely than those with low exposure to have used condoms consistently (odds ratio, 1.9); similarly, individuals classified as having high exposure to radio broadcasts or public outreach events had increased odds of reporting consistent use compared with their low-exposure counterparts (1.4 and 1.5, respectively). No associations were found for exposure to billboards or peer education. Magazines were found to be the most cost-effective approach; they cost

about US\$22 per consistent condom user, compared with \$25 and \$31 per individual exposed to radio broadcasts or public outreach, respectively. Sensitivity analyses for a variety of variables and assumptions showed no change in relative cost-effectiveness across methods.

The researchers identified several limitations of their study: the inability to determine causal relationships between intervention methods and consistent condom use; possible respondent or social desirability bias because of reliance on self-reports of condom use; and the calculation of combined cost-effectiveness estimates for all three targeted population groups. Yet the investigators believe their findings provide policymakers and program funders with “new information regarding the comparative costs and cost-effectiveness of several BCC methods [that] can help to guide intervention choices particularly in contexts with high levels of risk behaviors and low levels of HIV/AIDS awareness.” In implementing any particular intervention, they recommend that policymakers and program planners develop context-specific outreach efforts, and that future research employ “a quasi-experimental design to evaluate cost-effectiveness by specific target groups in combination with other interventions.”—*J. Thomas*

REFERENCE

1. Hsu J et al., Comparative costs and cost-effectiveness of behavioural interventions as part of HIV prevention strategies, *Health Policy and Planning*, 2013, 28(1):20–29.

post-natal care. Women can also purchase separate vouchers to cover family planning services.

To determine if the voucher program was associated with increases in use of maternal health services in the two Nairobi slums, researchers compared data collected through the Nairobi Urban Health Demographic Surveillance System before the voucher program was implemented with data collected after implementation. The first data set consisted of 1,927 women aged 12–54 who had had either a live birth or a stillbirth in 2004–2005; the second consisted of 2,448 similarly aged women with a live birth or stillbirth between September 2006 and December 2008. The data included information on participants’ social and demographic characteristics and birth history, as well as on place of delivery, skilled birth attendance, vaccination coverage and (for births in 2006–2008) voucher use. The four outcomes of interest were having any prenatal care, having four or more prenatal care visits, delivering in a facility and delivering with a skilled attendant. Logistic regression was used to estimate the odds of facility-based delivery before and after implementation of the voucher program.

Overall, 54% of participants lived in Korogocho. Forty-eight percent were aged 12–23 at the time of the birth, 45% were aged 24–34 and 8% were 35 or older; 30% had only one child. More than three-quarters of the women had at least a primary education. Among women who delivered in 2006–2008, 76% knew of the voucher program, and 45% had purchased the safe motherhood voucher. In 2004–2005, 65% of women delivered at a facility and 70% had the assistance of a skilled attendant; in 2006–2008, those figures were 72% and 74%, respectively.

In multivariate analyses, participants had greater odds of delivering in a facility after the voucher program began than before (odds ratio, 1.4). Women were more likely to have had a facility delivery if they were aged 24–34 than aged 12–23 (1.2), and if they had a secondary education rather than no education (1.6). Women residing in Viwandani were less likely than those in Korogocho to have a facility delivery (0.6), and the odds of delivering in a facility decreased as parity increased. Analyses of skilled birth attendance yielded similar findings, including elevated odds of usage after voucher implementation (1.2).

However, the association between voucher implementation and use of maternal health

Voucher Program in Kenya Is Associated with Increases In Skilled Birth Attendance and Facility Deliveries

Two recent studies conducted in Kenya suggest that voucher programs designed to subsidize poor women’s access to maternal health care are associated with increases in facility-based deliveries and in skilled attendance at delivery, though not in other maternal health services.^{1,2} In the first study, women living in informal settlements in Nairobi were more likely to deliver in a facility and have a skilled attendant after implementation of a voucher program in 2006 than they had been before implementation (odds ratios, 1.4 and 1.2). Similarly, a survey conducted in six rural districts around the country found that women who lived in communities where the voucher program had been initiated were more likely to have facility-based deliveries and skilled

birth attendance than were women in communities without the program (2.1 and 2.0, respectively). However, neither study found that the voucher program increased utilization of prenatal care.

Unattended delivery is one of the greatest risk factors for maternal mortality. Since 2006, as part of Kenya’s efforts to reduce maternal mortality, poor pregnant women in three rural Kenyan districts (Kiambu, Kisumu and Kitui) and two informal settlements in Nairobi (Korogocho and Viwandani) have been eligible to buy inexpensive safe motherhood vouchers that cover four prenatal care visits, delivery at a facility (including caesarean section, if necessary), treatment of maternal and neonatal complications, and

services did not extend to uptake of prenatal care. Analyses revealed no change in the likelihood that women had obtained at least one prenatal visit, and decreases occurred in the odds that women had had four or more prenatal visits (0.7) or had had a visit during the first trimester (0.8). The relationships between the three prenatal visit measures and respondent characteristics varied, but in general prenatal visits were negatively associated with parity and positively associated with education and socioeconomic status.

The researchers note that the biggest limitation of their study is the lack of contemporaneous control groups, which prevents the study from being a true impact evaluation. However, to explore whether the increase in the odds of a facility delivery and skilled attendance reflected a broader trend in health care utilization, the authors examined whether an unrelated type of care—vaccination among children aged 12–23 months—also increased between 2004–2005 and 2006–2008; they found no change in immunization rates. The researchers conclude that the voucher program “appears to be an effective mechanism to target low-income urban women and give them the financial means to overcome economic barriers to a facility delivery.”

Rural Sites

To estimate the impact of vouchers on the use of reproductive health services (including family planning) in rural communities exposed to the program, researchers examined data collected in 2010 from 2,527 randomly selected women aged 15–49 who lived within 5 km of a health facility in three voucher sites (Kiambu, Kisumu and Kitui) or in three comparison districts with similar population characteristics and health services (Makueni, Nyandarua and Uasin Gishu). Women were eligible for the survey if they were pregnant or had given birth within the last 12 months; if no such woman was available in the selected household, a woman in the same age-group who was sexually active (and thus a potential contraceptive user) was interviewed. The information collected included demographic characteristics, health care utilization, birth

history, and family planning knowledge and use; women who had given birth in the five years before the survey provided details on prenatal care, delivery and postnatal care services for all deliveries during that period. The outcomes of interest were use of any family planning method (ever and in the past 12 months); use of a long-acting or permanent method (ever and in past 12 months); having had four or more prenatal care visits; having had a first-trimester prenatal care visit; having delivered in a facility; having had a skilled birth attendant; and having used postnatal care services. Exposure to the voucher program was categorized according to whether women lived in an area where the program had been implemented in 2006, where the program had been implemented in 2010 (the same year that the survey was conducted) or where it had not been implemented at all (nonvoucher sites). The researchers estimated multilevel logit models to predict service utilization by program exposure.

Overall, more than three-quarters of the women were aged 15–34; most had at least a primary education, lived in a rural area, and were currently or formerly married or cohabiting. Forty percent were unemployed, and 74% were poor. Only 3% of women in the nonvoucher areas had ever heard of the vouchers, compared with 82–88% of women in the two intervention areas. Twenty-one percent of women in each exposure group, but none of the women in the comparison areas, had ever used a voucher.

Compared with women in the nonvoucher areas, those who lived in areas where the program had been in effect since 2006 were more likely to have ever used a long-acting or permanent method, though the two groups did not differ on the other three measures of contraceptive use (odds ratio, 1.5). The odds of having used a method ever and in the past year were lower among those not exposed to the voucher program until 2010 than among those not exposed at all (0.3 and 0.5, respectively).

For births that occurred after the voucher program began, women in communities where the program had been initiated in

2006 were more likely than those in unexposed communities to have had a facility-based delivery and to have been assisted by a skilled attendant (odds ratios, 2.1 and 2.0, respectively). However, the odds that a woman had received antenatal care (a first-trimester visit or four total visits) or postnatal care did not differ by voucher status. In addition, age was positively associated with having had four or more prenatal visits, having delivered in a facility and having had an attended birth, and parity was negatively associated with all safe motherhood services. Regardless of community exposure to the voucher program, nonpoor women were more likely than poor women to have delivered at health facilities, received skilled delivery care and used postnatal care services.

The researchers note a number of limitations. Although the vouchers were intended for poor women, some were sold to other women, which may have reduced the number available to those most in need. In addition, some aspects of the study design (e.g., the focus on women living within 5 km of a facility) may have affected estimates of the voucher program’s impact; the researchers were not able to determine the degree to which changes in service usage were attributable to the vouchers; and most of the variables used in models of service utilization referred to the time of the survey, not of the birth. The researchers note that although the voucher program “is associated with increased health facility deliveries and skilled delivery care,” it has had little apparent impact on antenatal care and “has not eliminated the gap [in service utilization] between the poor and nonpoor.” Thus, “there is need to consider other dimensions of access, such as availability and acceptability of services.”—*L. Melhado*

REFERENCES

1. Bellows B et al., Increase in facility-based deliveries associated with a maternal health voucher programme in informal settlements in Nairobi, Kenya, *Health Policy and Planning*, 2013, 28(2):134–142.
2. Obare F et al., Community-level impact of the reproductive health vouchers programme on service utilization in Kenya, *Health Policy and Planning*, 2013, 28(2):165–175.