

Countries with a Reputation for Strong Leadership On AIDS Policies Usually Deserve Their Standing

Countries that have a good reputation for leadership regarding AIDS policies generally deserve those reputations, according to an analysis of data from 82 nations.¹ Such countries, the study reveals, tend to do a better job of providing highly active antiretroviral therapy (HAART) to their citizens than might be expected given their resources, political structure, healthcare system and other factors. For example, in Brazil, Mexico and Thailand—all of which have a reputation for strong leadership on AIDS prevention and treatment—the proportion of people who receive the antiretroviral therapy they need exceeds by 44–56 percentage points the level one might expect on the basis of economic and institutional constraints. Conversely, HAART coverage in South Africa, whose government has repeatedly espoused controversial AIDS policies, falls far short of predicted levels, given the country's resources.

Assessing whether countries with good reputations on AIDS leadership (e.g., Brazil, Mexico, Thailand, Botswana and Cambodia) and those with less stellar reputations (e.g., South Africa, Russia, Ukraine, China and Zimbabwe) deserve such status poses several challenges, not least of which is choosing appropriate criteria. The author of this analysis argues that leadership should be considered in the context of what is possible and reasonable to expect. Therefore, a country was judged to have good leadership if the proportion of people needing HAART in December 2006 who were receiving it was at least 15 percentage points higher than the proportion one might expect on the basis of the country's characteristics. Several of these characteristics concerned a country's resources, including per capita income, whether the country is a focus country in the U.S. President's Emergency Plan for AIDS Relief (PEPFAR) program and whether the country had received a first-round Global Fund grant. Other variables were related to the severity and distribution of the country's HIV epidemic (e.g., prevalence of HIV, proportion of HIV-positive people living in urban areas), the

state of the country's health care system (e.g., proportion of births attended by skilled health professionals) and the country's political structure (e.g., whether it is an established democracy). All data were obtained from the World Health Organization, the World Bank and the Joint United Nations Programme on HIV/AIDS.

The analysis was conducted for 82 developing countries affected by AIDS. Associations between country characteristics (most of which were measured in 2005) and HAART coverage were assessed using regression analysis. The researcher supplemented the main regression with two additional models that served as sensitivity analyses. One added language fractionalization to the main model, on the assumption that countries where many languages are spoken may have greater difficulty providing HAART coverage; the other model added this plus region (Latin America/Caribbean, Southern Africa or West Africa) to the analysis. Finally, an additional regression, mirroring the main HAART analysis, examined countries' coverage of treatment to prevent mother-to-child transmission of HIV.

Overall, four variables were related to provision of antiretroviral therapy. On average, HAART coverage increased by 67% if a country was a PEPFAR focus country, and by 55% if it was an established democracy. In addition, coverage increased by 0.2% for every percentage point increase in HIV prevalence and by 2.5% for every percentage point increase in the proportion of the HIV-positive population that lived in urban areas.

In 11 countries, HAART coverage surpassed the expected level by at least 15 percentage points in all three regression models. Of these, the countries that exceeded expectations by the greatest degree in the main analysis were Cambodia (by 59 points), Mexico (56), Thailand (49), Brazil (44) and Paraguay (42); other countries that consistently scored well (17–27 points above expectations) were Burkina Faso, Costa Rica, Mali, Namibia, Suriname and Uganda. Because of

missing data, four countries were not included in the two sensitivity models; however, in the main analysis, HAART coverage substantially exceeded expected levels in two of these countries: Cuba (74) and Rwanda (33).

Another 46 countries had coverage scores that fell within 15 points above or below their expected values in all three HAART models, and were thus considered performing as expected. Among these countries was Botswana, which has universal HAART coverage. Results across models were inconsistent for 18 countries. Latvia was particularly striking in this regard: Its score in the main model was the lowest of any country (55 points below expectations), but the deficit was negligible (7 points) in the sensitivity model that included both language fractionalization and region. Finally, three countries fell substantially short of expectations in all three models: South Africa (by 36 points in the main model), Trinidad and Tobago (28) and Uruguay (20).

HAART coverage did not necessarily correlate with coverage of treatment to prevent mother-to-child transmission of HIV. For example, Russia and Ukraine both scored below expectations in at least one of the HAART models, but scored 68–75 points above expected levels in preventing mother-to-child transmission.

The researcher notes that HAART coverage is not a direct measure of political leadership, and it is only one of several possible indicators of a country's policy responses to the AIDS crisis. Nonetheless, the results suggest that countries such as Brazil, Cambodia, Mexico, Namibia, Thailand and Uganda—and probably Cuba and Rwanda—have “performed better than expected given their institutional characteristics, demographic challenges and level of development,” and as such “their reputation as poster children for good AIDS leadership is probably well deserved.” Several other countries with high scores do not have reputations as leaders, possibly indicating that policies and practices such as facilitating the importation of generic HAART drugs (Burkina Faso) and ensuring an effi-

cient, well-organized health system (Suriname) have been underappreciated.

Although Russia and Ukraine, which have negative reputations, did not meet the criteria for poor leadership, their high scores on preventing mother-to-child transmission suggests that those countries are focusing more on helping pregnant women than on providing antiretroviral medications to the intravenous drug users who account for most of their AIDS cases. South Africa's HAART scores, on the other hand, are consistent with the country's "reputation for poor AIDS leadership" and suggests that ideological reasons, rather than economic or institutional constraints, have limited HAART coverage.—P. Doskoch

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In Africa, Adolescents Who Have Premarital Sex Show Higher Dropout Rates

Young women in Ghana, Malawi and Uganda who have had premarital sex are significantly more likely than those who have not had sex to drop out before completing secondary school (odds ratios, 1.9–3.2).¹ Premarital sex is not associated with dropping out among young women in Burkina Faso, however, and among young men it is associated with dropping out only in Uganda (1.7). In all four countries, young women enrolled in school at the outset of adolescence are more likely than their male counterparts to leave school before completing a primary education, to leave after completing a primary education but before beginning secondary school and to leave before completing secondary school (1.3–2.1).

As the level of formal education has increased throughout Sub-Saharan Africa, so too has the number of students attending school after puberty begins. At the same time, age at marriage has increased and the proportion of adolescents and young adults engaging in premarital sex has generally risen, so that adolescents must negotiate sexual maturation and sexual debut during their school years. Few studies have examined the relationship between sexual behavior and educational outcomes among adolescents in Sub-Saharan Africa; fewer still have examined

these associations among male adolescents.

In an analysis of data from nationally representative, household-based surveys conducted in 2004 among male and female 12–19-year-olds in Burkina Faso, Ghana, Malawi and Uganda, researchers examined relationships between premarital sex and leaving school among respondents who had been attending school at age 12. The participating countries represent different regions of Sub-Saharan Africa, have different educational systems (in terms of duration of primary schooling and fees) and have different levels of adolescent sexual activity, thus permitting examination of whether the relationship between sexual behavior and education outcomes varies in diverse contexts. Respondents provided a variety of social and demographic information, including age, marital status, socioeconomic status, place of residence, household head's educational attainment, and the ages at which they had first had sex, started school and left school. The three outcomes of interest were leaving school prior to completing the primary grades, after completing primary school but before going on to secondary school, and prior to completing secondary school. Discrete-time hazard models estimated with logistic regression were used for each schooling outcome.

Among 18–19-year-olds who had been attending school at age 12 and had completed primary school, half or more reported that they had had sex (49–74%), except in Ghana, where 31% of males and 44% of females had done so. In Ghana and Uganda, higher proportions of females than males in this group had had premarital sex, whereas the reverse was true in Malawi. The proportion of respondents in this group who had had premarital sex while in school ranged from 16% in Ghana to 54% in Malawi among males, and from 18% in Ghana to 37% in Uganda among females; only in Malawi was the proportion among males significantly different from that among females (54% vs. 27%).

In all four countries, females who were still in school at age 12 were more likely than males to drop out before completing secondary school (odds ratios, 1.3–2.0). A similar pattern was apparent at the primary level: In every country but Burkina Faso, females were more likely than males to drop out before completing primary school (1.6–1.8), and in Uganda and Burkina Faso, females who had completed primary school were more likely than their male counterparts to not go on to secondary school (1.4 and 2.1, respectively).

Premarital sex was associated with dropping out of school in three of the four countries. For females, the odds of dropping out before completing secondary school were elevated approximately twofold in Malawi and Uganda (odds ratios, 1.9–2.0), and more than threefold in Ghana (3.2), among those who had had premarital sex. For males, the odds of dropping out were elevated only in Uganda (1.7). Premarital sex was associated with leaving school prior to completing a primary education in Ghana (5.3) and Malawi (1.9) among females, and in Uganda (1.6) among males. Among other individual and household variables, the ones most consistently associated with leaving primary or secondary school were urban residence and household head's educational attainment, each of which was negatively associated with dropping out in about half of the country–gender combinations.

Overall, the findings suggest that in the four countries examined, females are more vulnerable than males to leaving school once they have matured sexually and had premarital sex. The researchers note that their findings "can help make researchers, policymakers, and program managers aware that the timing of sexual intercourse and leaving school are related, even in countries with very different educational systems and demographic characteristics." They suggest that "the next step is to examine in depth the mechanisms through which sexual activity leads to a higher risk of leaving school for girls."—L. Melhado

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Microbicide Shows No Protective Effect in South African Clinical Trial

Carraguard, a microbicide effective at blocking transmission of recombinant simian HIV among rhesus macaques, failed to show a protective effect among women in a multisite, placebo-controlled, double-blind trial in South Africa.¹ The study was the fifth major trial to assess the effectiveness of a candidate microbicide, and it differed from its similarly unsuccessful predecessors in part because in-

vestigators took steps to more accurately track the microbicide's use. Although fewer seroconversions occurred among women who used the microbicide during heterosexual vaginal intercourse compared with those who used the placebo gel (3.3 vs. 3.8 per 100 woman-years), the difference was not statistically significant.

The study participants were sexually active, HIV-negative women aged 16 or older who were recruited from health clinics, malls, churches and other public venues in Isipingo, Soshanguve and Gugulethu, South Africa. Those who were pregnant or planned to become pregnant in the next two years, had been pregnant in the prior four weeks, had ever had a positive Pap smear or had used illicit injection drugs in the past year were excluded. The 6,202 eligible, consenting participants were randomly assigned to receive either Carraguard, a seaweed-based gel that prevents *in vitro* mucosal transmission of HIV-1 (and possibly other STIs), or the placebo, a methylcellulose gel chosen for its safety, lack of microbicidal properties and physical similarity to Carraguard.

Participants were instructed to visit their clinic at enrollment, month one, month three and every third month thereafter for a total of 9–24 months. They were tested for HIV at each follow-up visit; they also received a pelvic exam, counseling on HIV risk reduction and family planning, and a pregnancy test at every visit, as well as periodic tests for STIs other than HIV. Those found to be HIV-positive or pregnant were disqualified from further participation in the study. At each visit, women received a supply of their assigned gel and as many male or female condoms as they desired. They were instructed to insert the gel prior to vaginal sex and to use a condom with the gel during sex.

To assess whether the women were using the gel, the researchers asked participants to return all opened and unopened gel applicators at each visit, and they used bar codes to verify that women had returned the same applicators that had been issued to them. In addition, the researchers applied a dye that reacts to vaginal mucus to each opened applicator to verify that it had been inserted into the vagina.

The main outcome variable, time to seroconversion, was defined as the length of time between a participant's first clinic visit and the midpoint between the positive HIV test and the most recent negative test, plus one

day. The researchers also measured the incidence of other STIs and vaginal infections and the safety of the microbicide and the placebo.

Women in the Carraguard and placebo groups were similar in their social and demographic characteristics, and they reported similar levels of risky sexual behaviors and contraceptive use. In both groups, most participants were aged 25 or older (63%) and single (63%). On average, participants had had about 11 years of education and earned less than US\$150 per month. Twenty-six percent had an STI at baseline. The two groups had experienced similar levels of partner abuse (34–36%) and forced sex (10–11%) in the prior three months; 9% in each group said they had multiple sex partners and 17–18% reported that their main partner had other partners. Among women with multiple sexual partners, 60–63% had used condoms during their most recent sex act, compared with 33% among all women with a steady partner.

During the trial, the frequency of vaginal sex and use of condoms and gel were similar in the two groups. Women engaged in an average of 2.5 sex acts per week; 96% reported using gel at their last sex act, and 64% reported using a condom. Participants returned 92% of the gel applicators, of which 70% had been opened. Dye tests showed that 61% of opened applicators had been inserted vaginally. The researchers estimated that participants had used gel during only 42% of their sex acts.

A total of 285 participants seroconverted. Although the incidence of seroconversion was slightly lower in the microbicide group than in the placebo group (3.3 vs. 3.8 per 100 woman-years), neither this finding nor the difference in time to seroconversion was statistically significant. Participants who were younger, had had an STI at screening or were from the Isipingo research site had elevated odds of contracting HIV. No safety concerns arose, nor did the two groups differ in rates of pregnancy or STIs.

While the results indicate that "Carraguard is unlikely to have a meaningful protective effect as used by study participants," the researchers point out that several factors may have contributed to the lack of efficacy: participants' low level of adherence to the gel-and-condom regimen; HIV transmission through anal sex, an act that may have been underreported; and the possibility that the methylcellulose gel was not a true placebo and thus

offered some protection against the virus. Exit interviews with a subset of participants indicated that nonuse of gel was most commonly due to participants' running out of or forgetting to use the gel, leading the researchers to suggest that "even a highly efficacious coitally-dependent product" may have "insufficient effectiveness in real-life settings." However, they stress that despite the disappointing results in this and previous microbicide trials, "the search for female-controlled HIV-prevention methods must continue."—H. Ball

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Risk of Fetal Loss Is Elevated Among Women in Cameroon Abused by Intimate Partner

Women who have experienced physical, sexual or emotional violence at the hands of their spouse are at elevated risk for fetal loss and recurrent fetal loss, according to an analysis of data from the most recent Cameroon Demographic and Health Survey.¹ The odds of fetal loss are particularly high among women who have experienced sexual violence or multiple forms of violence (odds ratios, 1.7 each), while recurrent fetal loss is most strongly linked to emotional violence (1.7). The researchers estimate that reducing spousal violence by half would prevent 17% of fetal losses, and eliminating such violence completely would reduce fetal loss by 33%.

Although several studies have found links between spousal violence and birth outcomes, little is known about these associations in Sub-Saharan Africa. To help address this gap, researchers analyzed data from the 2004 Cameroon Demographic and Health Survey, a nationally representative study that, unlike other large African surveys, differentiated between voluntary fetal loss (abortion) and involuntary fetal loss (miscarriage, stillbirth). The analysis focused on the 2,562 female respondents aged 15–49 who completed a special survey module concerning spousal violence. Respondents reported whether they had ever experienced violence from their spouse, including physical violence (ranging from pushing and shoving to attacks with a weapon), emotional violence

(verbal or physical public humiliation, or verbal threats to the woman or her family) and sexual violence (forced sex or sexual acts). Associations between violence and birth outcomes—categorized as early fetal loss (miscarriage), late fetal loss (stillbirth), or any fetal loss—were assessed using logistic regression models that controlled for maternal and spousal age, parity, marriage type (polygamous or monogamous), socioeconomic status, residence (urban or rural), maternal and spousal education, and religion.

On average, respondents were 30 years old; about a third had a secondary or higher education, and one in five were in a polygamous marriage. About half (51%) reported having experienced at least one type of spousal violence, most often physical (39%) or emotional (31%) violence; sexual violence was less common (15%).

Twenty-five percent of women had had at least one miscarriage or stillbirth; these fetal losses were more prevalent among women who had been exposed to spousal violence than among those who had not (29% vs. 21%), and more common among women who had experienced multiple types of violence than among those who had experienced just one (32% vs. 26%). In multivariate analyses, the odds of fetal loss were higher among women who had experienced spousal violence than among those who had not (odds ratio, 1.5); the association held for physical (1.5), emotional (1.6) and sexual (1.7) violence and was slightly higher among women who had experienced multiple types (1.7) than among those who had experienced only one type (1.4). Odds ratios for early fetal loss and for late fetal loss were generally similar to the odds for fetal losses overall.

The researchers estimated that for women who had experienced spousal violence, 33% of fetal losses would be averted if spousal violence were completely eliminated. Reducing spousal violence by 50% would prevent 17% of fetal losses. Among women who had experienced sexual violence or multiple forms of violence, the proportions of fetal losses prevented would be even greater: forty-seven percent if violence were eliminated, and 24% if violence were reduced by half.

The findings for recurrent fetal loss generally mirrored those for all episodes of fetal loss. Eight percent of women had had more than one episode of fetal loss; the odds of recurrent loss were elevated among women who had experienced any type of violence, physical

violence or sexual violence (odds ratio, 1.5 for each), and were highest among women who had experienced emotional violence (1.7) or two or more types (1.6). Among women who had experienced some form of spousal violence, eliminating violence entirely would prevent about a third of recurrent fetal losses (33%), and reducing violence by half would prevent a sixth of the losses (17%). Among women experiencing sexual violence, interventions that eliminated all such abuse would prevent 47% of recurrent fetal losses, and reducing sexual violence by half would prevent 24% of losses.

The researchers acknowledge that it is not certain that spousal violence or its aftereffects actually caused fetal losses, as the study data were cross-sectional and did not establish whether the violence women reported preceded their miscarriages and stillbirths. Moreover, both violence and fetal losses may have

been reported inaccurately by respondents. Nonetheless, the findings underscore the importance of reducing spousal violence in Cameroon and elsewhere in Sub-Saharan Africa. Such violence, the authors note, not only may affect birth outcomes through physical trauma, but also through psychological effects: Abused women may withdraw “from participation in public life” and thus not obtain adequate prenatal care. Overall, they contend, the results provide “a strong argument for routine prenatal screening for spousal abuse in Cameroon,” especially given that Sub-Saharan Africa has “a high prevalence of spousal violence and the highest fetal death rate in the world.”—P. Doskoch

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Audio Computer-Assisted Self-Interviews Do Not Necessarily Yield Higher Reports of Sensitive Behaviors

Women who participated in audio computer-assisted self-interviews (audio-CASI) were less likely than those in face-to-face interviews to report ever having had sex (35% vs. 48%) in response to a question on age at first sex, according to a randomized study among unmarried young women in rural Malawi.¹ However, women in the audio-CASI group were more likely than those in the conventional interview group to report having had multiple partners (27% vs. 17%) and having had sex with a friend or acquaintance (17% vs. 7%), as well as to give inconsistent responses regarding their sexual history. Respondents in the two interview groups had similar levels of STIs, although the association between sexual experience and STI status was stronger in the face-to-face group.

Most studies of audio-CASI have been conducted in developed countries, where computer literacy is high. To compare the effectiveness of the technique with that of face-to-face interviews in eliciting reports of sexual behavior in a developing country, researchers questioned 501 unmarried Malawian women aged 15–21 regarding their sexual history. The women lived in villages near centralized market areas in Balaka district, located in the region with the country’s highest rates of HIV infection, teenage pregnancy and

risky sexual behavior. Women were randomly assigned to a face-to-face interview or an audio-CASI interview on a laptop computer, during which they were asked about their age at first sex and, regardless of their answer, the types of partners they had had sex with (e.g., boyfriend, expected spouse, or friend or acquaintance). Following the interviews, researchers asked respondents whether they were willing to be tested for HIV and three other STIs (gonorrhea, chlamydia, trichomoniasis); 84% were tested for at least one infection using vaginal or oral swabs. Prior to testing, they were asked again—this time by trained nurses—about their age at first sex.

On average, respondents were 17 years old and had had seven years of schooling; about six in 10 were enrolled in school, and a little more than half were Muslim. Although the two interview groups were similar in most respects, a lower proportion of those in the face-to-face group than in the audio-CASI group were born-again Christians or had “made tauba” (a form of Muslim conversion—29% vs. 37%). To account for differences between the two interview groups, reports of sexual behavior were estimated as predicted percentages derived from logistic regression models that adjusted for respondents’ background characteristics.

Lower proportions of respondents in the audio-CASI group than in the face-to-face group reported ever having had sex (35% vs. 48%) or having had sex with a boyfriend (21% vs. 31%)—findings that belie the common belief that relatively anonymous interviewing methods, such as audio-CASI, will elicit more reports of stigmatized or sensitive behavior than will face-to-face interviews. In contrast, higher proportions in the audio-CASI group reported having had sex with a friend or acquaintance (17% vs. 7%) or having had more than one sexual partner (27% vs. 17%).

To explore how different measures of sexual activity affected the reporting of premarital sex by interview mode, the researchers created composite variables based on the “ever had sex” and “sexual partner” variables. A higher percentage of women in the audio-CASI group than in the face-to-face group reported that they had had sex or had had at least one sex partner (58% vs. 48%). Furthermore, while only 25% of face-to-face respondents said they had had sex with someone other than a boyfriend or expected spouse, 42% of audio-CASI respondents reported having had such partners. These results are consistent with the expectation that computer-assisted interviews will elicit higher reporting of premarital sex than face-to-face interviews when a broader set of questions are considered.

The responses of women in the audio-CASI group were more inconsistent than those of women who were interviewed face-to-face: Thirty-five percent of women in the former group said they had never had sex, yet identified a sexual partner in later questions, while 22% of those who said they had had sex later failed to identify any partners. Only a few women in the face-to-face group gave inconsistent responses.

The study also gauged inconsistent reporting by comparing responses at the initial interviews with those elicited by the nurses who administered STI tests. Similar proportions of respondents in the audio-CASI and face-to-face groups originally said they had had sex but later denied it (8% and 7%, respectively), whereas a higher proportion of women in the audio-CASI group than in the face-to-face group originally said they had never had sex but later reported that they had (38% vs. 19%). When the composite measure was compared with women’s later responses to the nurses, audio-CASI respondents had

higher rates of inconsistent reporting than did face-to-face respondents for each of the preceding scenarios (18% vs. 7% for later denying having had sex, and 24% vs. 20% for later reporting having had sex).

Fourteen percent of the study sample tested positive for an STI; 6% were HIV-positive, 6% had gonorrhea, 2% had trichomoniasis and 1% had chlamydia. Among respondents who said at the initial interview that they had ever had sex, 26% of those in the face-to-face group and 15% in the audio-CASI group tested positive for an STI; among those who reported at the nurses’ interview that they had ever had sex, the proportions testing positive were similar (23% and 14%, respectively). Chi-square tests found that the association between STI status and behavior was stronger among women in the face-to-face group, yet in both groups a number of women who denied ever having had sex tested positive for an STI.

Overall, the study suggests that audio-CASI does not necessarily elicit higher rates of sensitive behaviors than do face-to-face interviews, and the researchers suggest that data on such behaviors, particularly when collected from adolescents in developing countries, must be viewed with healthy skepticism. They assert that “in light of the importance of behavioral data for understanding both the etiology of the AIDS pandemic and the results of clinical trials...to reduce the transmission of sexually transmitted infections,” further quantitative and qualitative research is needed on interview mode effects, “particularly among adolescents and young adults.”—J. Thomas

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Universal Access to HIV Therapy May Reduce The Stigma of Infection

In Botswana, individuals who perceive that antiretroviral therapy is readily available to members of their community have less negative attitudes toward people with HIV than those who say that treatment is not accessible, according to a population-based study.¹ Respondents who reported that antiretroviral therapy was available in or near their village had greatly reduced odds of having negative

attitudes toward those with HIV (odds ratios, 0.4) and of expecting to be the target of such attitudes should they become infected (0.1). Moreover, nearly two-thirds (63%) believed that increased access to anti-HIV drugs had reduced the stigma of infection.

Few studies have explored the impact of universal access to HIV treatment on stigma in a developing country. The investigators note that Botswana, where 24% of adults are HIV-positive, is a particularly appropriate setting for such research, as prejudice toward individuals with HIV was common prior to the 2002 inception of a national antiretroviral treatment program. Furthermore, Botswana has the second-highest rate of HIV infection of any country.

In November–December 2004, investigators surveyed a population-based sample of adults aged 18–49 living in the five districts of Botswana that have the greatest number of HIV-positive residents. The researchers used a probability sampling design to choose households within these regions, and interviewed 1,268 randomly selected respondents, who provided information on demographic characteristics, emotional and physical health, and condom use and clinic visits in the last 12 months. They also answered 15 questions designed to test their knowledge of HIV, as well as seven items examining their attitudes toward people with HIV and nine items assessing whether they anticipated encountering negative attitudes if they were to become infected. The relationship between respondent characteristics and HIV-related attitudes were evaluated using multivariate logistic regression.

About half of the respondents were women (52%) and a similar proportion had more than a high school education (54%). Forty-four percent lived in urban areas, while the rest were split between somewhat less developed “urban villages” (30%) and rural areas (27%). The vast majority (88%) said that HIV treatment was available nearby, and one-third had visited a health clinic at least three times in the past year. About four in 10 (38%) reported that they had used a condom every time they had had sex in the past year. On average, respondents correctly answered half of the HIV knowledge questions.

Thirty-eight percent of respondents had at least one negative attitude toward HIV-positive individuals. Two items were endorsed by about one-quarter of respondents: Twenty-seven percent said they would not share a

meal with someone who had HIV, and 23% would not buy food from an infected shopkeeper. In contrast, only 3–5% said they would not care for an HIV-infected relative, or believed that people with HIV should be expelled from school or denied certain rights.

Seven in 10 respondents reported that they would expect to encounter negative reactions if they were to become HIV-positive. More than half (54%) thought their community would ostracize them, 31% thought they would be treated badly at work or school and 30% said their spouse or partner would break up with them. Smaller proportions feared physical abuse (12%), job loss (12%), ill treatment from health professionals (12%) or not receiving care from their family (8%).

In a multivariate analysis adjusting for demographic and health variables, respondents had reduced odds of reporting at least one negative attitude if they reported having access to HIV treatment (odds ratio, 0.4). In addition, the odds of having negative attitudes were lower among residents of urban villages and rural regions (0.6 for each) than among those who lived in urban areas, and respondents with more than a high school education (0.7) and those who had visited a health clinic three or more times in the past year (0.7) had lower odds than those with less education or fewer clinic visits, respectively. Negative attitudes were more common among inconsistent condom users (1.6) than among those who always used condoms.

Most of these factors were also associated with respondents anticipating some type of negative reaction if they were to become HIV-positive: Odds were reduced among respondents who had access to HIV treatment (odds ratio, 0.1), lived in rural areas (0.7) or had visited a clinic at least three times in the past 12

months (0.7), and were elevated among inconsistent condom users (1.8). In addition, anticipating adverse reactions was negatively associated with HIV knowledge (0.8 for each additional correct response), and women were less likely than men to expect such reactions (0.7).

Overall, 63% of respondents agreed that universal access to antiretroviral therapy has helped reduce prejudice toward HIV-positive individuals. Furthermore, larger proportions of respondents had tolerant attitudes toward those with HIV in this survey than in a similar 2001 study. For example, 97% of respondents in the current study agreed that an HIV-positive teacher who is not sick should be allowed to teach, compared with just 59% in the earlier survey.

However, because of the study's cross-sectional design, the researchers caution that the causality of the link between access to HIV therapy and negative attitudes cannot be determined; in addition, these results, which may not apply to all Botswanans, could be influenced by social desirability bias and by recent initiatives designed to reduce stigma, such as "opt-out" HIV testing. They add that these findings reflect only attitudes, not behaviors, and should not be seen as "grounds for complacency," especially since women and other vulnerable groups continue to feel the effects of stigma. Rather, the researchers suggest, universal treatment access should be considered one piece of a "multimodal strategy" that "empowers people living with HIV/AIDS to take an active role in combating stigma and discrimination."—S. Ramashwar

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