report

MIDLINE EVALUATION OF THE ZAMBIA-LED PREVENTION INITIATIVE (ZPI)

Zambia-led Prevention Initiative

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Acronyms

AIDS	Acquired immune deficiency syndrome
ART	Antiretroviral therapy
CAGE	Cutting down, annoyance by criticism, guilty feeling, and eye-openers (alcohol abuse assessment)
CBO	Community-based organization
CHAMP	Comprehensive HIV/AIDS Management Program
CMMB	Catholic Medical Mission Board
GRS	Grass Roots Soccer
CSO	Central Statistical Office
DHS	Demographic Health Survey
FHI360	Family Health International 360
GEM	Gender equitable men
GBV	Gender-based violence
HIV	Human immunodeficiency virus
HTC	HIV testing and counseling
KAP	Knowledge, attitudes, and practices
MC	Male circumcision
MCP	Multiple and concurrent partnerships
MOT	Modes of transmission
NGO	Non-governmental organization
PDA	Personal digital assistant
PMTCT	Prevention of mother-to-child transmission
SEA	Standard enumeration areas
STI	Sexually transmitted infections
UNZA	University of Zambia
USAID	US Agency for International Development
ZDHS	Zambia Demographic Health Survey
ZHECT	Zambia Health Education and Communication Trust
ZPI	Zambia-Led Prevention Initiative
ZSBS	Zambia Sexual Behavioral Survey

Executive Summary

The Zambia-Led Prevention Initiative Program[1] (ZPI) is a USAID-funded initiative designed to increase the delivery and uptake of community-led HIV prevention interventions and to generate an evidence base for diffusion of effective approaches. The goal of ZPI is to increase utilization of community-level interventions aimed at reducing HIV transmission, including promotion of safer sexual practices, HIV testing and counseling (HTC), voluntary medical male circumcision, and prevention of mother-to-child transmission (PMTCT). ZPI also implements structural interventions to address key drivers of the HIV epidemic such as alcohol and substance abuse, gender-based violence (GBV), gender inequitable norms, and economic inequities. Such interventions include entrepreneurship skills building; raising awareness about the connection between GBV, alcohol abuse, and HIV; and GBV training for men, women, and young people.

We conducted a midline evaluation in Copperbelt, Eastern, Luapula, and Western provinces as part of ZPI's evaluation. The evaluation is based on two cross-sectional community-based behavioral surveys (baseline: July/August 2011; midline: August/September 2013). Males (15–59 years) and females (15–49 years) were randomly selected from the four provinces. At baseline, a total of 845 males and 1,594 females completed the survey; this is 94 percent of the male and 89 percent of the female target sample size. At midline, 750 males and 1,437 females completed the survey. Face-to-face interviews were conducted by interviewers using a handheld personal digital assistant (PDA) and responses were entered on the same PDA. Chi-square test was used to compare baseline and midline as well as people exposed and not exposed to HIV prevention interventions. Analysis was stratified by sex, community, and exposure.

Increased exposure to HIV prevention activities (including ZPI activities) was associated with positive changes in outcomes including HIV testing, condom use in males, income earning among females, and gender equitable attitudes2 in both males and females. Among males, those who were exposed to HIV prevention interventions were significantly more likely to have been tested for HIV compared to those not exposed (67 percent versus 54 percent). This was observed only in Western and Eastern provinces. Furthermore, while there were variations across provinces in the change in rates of non-regular partnerships in both males and females, self-reported condom use with the last non-regular sex partner increased significantly from baseline to midline in both males (23 percent to 60 percent) and females (38 percent to 49 percent) in all provinces, and was significantly higher for males among those exposed (72 percent) compared to those unexposed (53 percent). Additionally, a significantly higher proportion of females exposed to income generation activities (40 percent) reported earning income compared to those not exposed (25 percent). Lastly, although the support of inequitable gender norms was significantly lower among those exposed to HIV prevention interventions compared to those not exposed among males (27 percent versus 36 percent) and females (33 percent versus 38 percent), the difference is minimal.

The following outcome indicators showed improvements from baseline to midline, although there was no difference between exposed and unexposed groups: i) HIV knowledge levels; ii) HIV testing rates; iii) access to condoms; iv)

[1]FHI360 is the lead partner implementing ZPI, in collaboration with the Population Council, Catholic Medical Mission Board (CMMB), Afya Mzuri, Comprehensive HIV and AIDS Management Program (CHAMP), and Zambia Health Education and Communications Trust (ZHECT).

[2]Gender equitable norms was measured using the Gender Equitable Men (GEM) Scale. Pulerwitz, J. and G. Barker. 2008. "Measuring attitudes toward gender norms among young men in Brazil: Development and psychometric evaluation of the GEM scale," *Men & Maculinities* 10: 322–338.

self-reported condom use; v) gender norms attitudes; vi) medical male circumcision indicators; vii) women's financial decision-making indicators; viii) self-reported contraceptive use; and ix) self-reported unintended pregnancy rates.

These are encouraging trends and are expected with an effective community-based project. However, attributing the improvements in the outcome indicators to the ZPI intervention remains a challenge. It is difficult to know how much ZPI activities are behind these changes. In support of ZPI's contribution to these changes in outcomes, service provision and utilization data of the ZPI project do show that ZPI has been implementing HIV prevention activities as planned, and has exceeded the target set for many program implementation indicators. For example, through September 2013, ZPI had provided HIV testing and counseling to 168,153 individuals, which is above the overall project target of 125,000. Additionally, it had reached 82,791 individuals with interventions and services that explicitly address GBV (88 percent of its target), and 9,916 individuals with entrepreneurship skills (94 percent of its target). In some cases, we found the greatest improvements in outcome indicators in provinces where ZPI has had greater coverage and time to implement (Eastern and Copperbelt) with minimal improvements in the province where ZPI had just started activities (Western). These data and findings are good indications that ZPI activities have positively influenced behaviors and attitudes related to HIV prevention.

Background

The Zambia-Led Prevention Initiative Program (ZPI) is a USAID-funded initiative designed to increase the delivery and uptake of community-led HIV prevention interventions and to generate an evidence base for diffusion of effective approaches. ZPI is implemented by a consortium of organizations[3] led by FHI360.[4] This report describes the findings from the midline survey conducted as part of ZPI's evaluation.

ZAMBIA'S EPIDEMIC AND STATE OF HIV PREVENTION SCIENCE

With an estimated HIV prevalence of 14.3 percent among men and women age 15–49 years, Zambia is one of the most affected countries in sub-Saharan African (Zambia Central Statistical Office 2007). As with other highly affected African countries, Zambia's epidemic is shaped by a complex set of social and behavioral factors. High rates of partner change and multiple concurrent sexual partners (MCP) have both been implicated in high HIV prevalence rates in many African countries (Morris and Kretzschmar 1997, Halperin and Epstein 2004, Mah and Halperin 2008, Morris et al. 2010). The Zambia Modes of Transmission (MOT) study (Zambia National HIV/AIDS/STI/TB Council 2009) estimates that individuals whose partners have casual heterosexual sex contribute most to HIV incidence and are responsible for 37 percent of total annual HIV incidence in Zambia, followed by individuals reporting casual heterosexual sex, who contribute 34 percent of the annual HIV incidence in Zambia. Further, STIs, evidenced as a contributing factor to the epidemic (Steen et al. 2009), are reported annually in about 5 percent of the population (Zambia Central Statistical Office 2007) and are found to be rising by some studies (Zambia Central Statistical Office 2010). Sexual risk reduction has shown some success with youth (age 15–24 years) (Gouws et al. 2008, International Group on Analysis of Trends in HIV Prevalence and Behaviours in Young People in Countries most Affected by HIV 2010); however, gaps in basic HIV knowledge exist among this same group (Zambia Central Statistical Office 2010). Gaps in HIV prevention are also evident. Zambia has had a fairly robust prevention of mother-to-child-transmission (PMTCT) program and has achieved commendable results: 59 percent of seropositive mother-infant pairs received maternal and infant Nevirapine in 2007–2008 (Stringer et al. 2010). However, only 28 percent of HIV positive children aged 0–14 years were put on antiretroviral therapy (Zambia National HIV/AIDS/STI/TB Council 2012). Lastly, with a low prevalence (13 percent) of male circumcision (MC) (Zambia Central Statistical Office 2007), population level benefits of adult MC programs in Zambia remain to be seen (Auvert et al. 2005, Bailey et al. 2007, Gray et al. 2007).

In Zambia, the highest HIV prevalence exists among certain sub-populations: female sex workers (65–69 percent), STI patients (43–57 percent), TB patients (52–61 percent), MSM (self-reported: 33 percent), and prisoners (27 percent) (Zambia National HIV/AIDS/STI/TB Council 2009). However, associations between socio-economic status (SES) and HIV prevalence in Zambia remain difficult to disentangle (Zambia Central Statistical Office 2007, Gabrysch et al. 2008, Malhotra and Yang 2011, Singh et al. 2011). In contrast, excessive alcohol use has been linked to unsafe sex in sub-Saharan Africa (Kalichman et al. 2007) and directly to HIV status in Zambia (Malhotra and Yang 2011), presenting yet another compounding factor to the epidemic. Similarly, gender-based violence (GBV) is associated with higher risk of HIV acquisition (Dunkle et al. 2004) and HIV-positive women experience GBV more (Maman et al. 2002); with over half of Zambia women experiencing GBV in their lifetime (Zambia Central Statistical Office 2007), this presents a substantial risk to women.

[3]FHI360 as lead, Afya Mzuri, Comprehensive HIV AIDS Management Programme (CHAMP), Hodi, Zambia Health Education and Communication Trust (ZHECT), Catholic Medical Mission Board (CMMB), Grass Roots Soccer (GRS), and the Population Council.

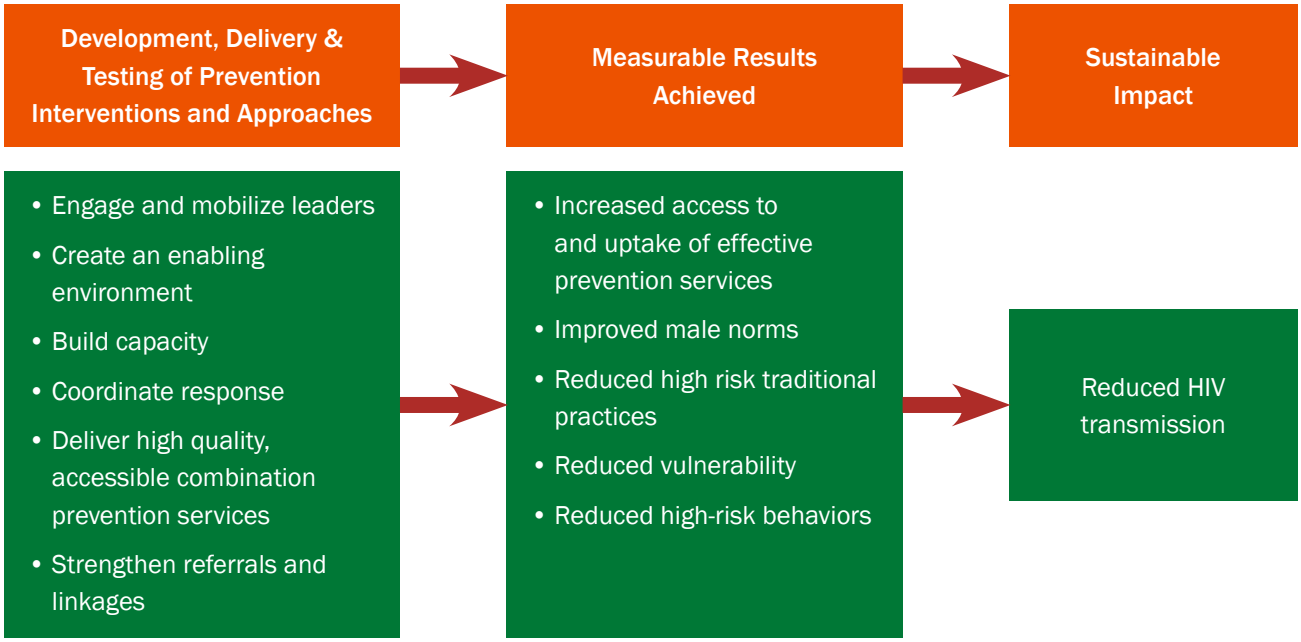
[4]FHI acquired Academy for Educational Development (AED) in July 2011.

ZPI DESCRIPTION

The purpose of ZPI is to increase utilization of proven community-level interventions (e.g., Men Taking Action, couples counseling) aimed at reducing HIV transmission including promotion of safer sexual practices, HIV testing and counseling (HTC), voluntary medical male circumcision, and PMTCT. ZPI also implements structural interventions to address key drivers of the HIV epidemic such as alcohol and substance abuse, GBV, gender inequitable norms, and economic inequities. Such interventions include entrepreneurship skills building; raising awareness about the connection between GBV, alcohol abuse, and HIV; and GBV training for men, women, and young people.

The conceptual framework (Figure 1) for the project illustrates how its key components are expected to ultimately contribute to reduced HIV transmission over the life of the project. This is to be achieved through behavior change brought about by building the capacity of communities to become agents of change.

FIGURE 1 CONCEPTUAL FRAMEWORK FOR ZPI



ZPI EVALUATION

The objective of the evaluation is to examine changes from baseline to midline in project outcome indicators including male norms, alcohol abuse, and other HIV knowledge, attitudes, and practices (KAP) indicators. The current report presents findings from the midline survey and comparisons of baseline and midline indicators.[5] The baseline report has been presented elsewhere (Zambia-led Prevention Intiative 2012). This study was approved by the Population Council Institutional Review Board in New York and the University of Zambia (UNZA) Ethics Committee.

[5]Appendix 1 in the ZPI baseline report includes indicators and targets for Years 1 and 3 and findings from the 2007 ZDHS.

METHODS

Study Design

This is a cross-sectional study design with repeated household surveys that measure HIV behavioral indicators in three groups of communities: communities where ZPI interventions were initiated in years 1, 2, and 3. This evaluation is based on changes over time from baseline (July/August 2011) to midline (August/September 2013).

Study Population

The study population draws from the population currently covered by the ZPI interventions. Districts were randomly selected from among those where ZPI activities were or are to be initiated in years 1, 2, and 3. Half of the selected districts were predominantly rural, and the other half had a significant urban or peri-urban population. The midline survey was conducted in the same provinces and districts as the baseline. Out of this universe, we randomly selected a number of geographical areas known as standard enumeration areas (SEA), within which the study was carried out.

For the midline survey, the survey team recruited and interviewed female and male residents by household in the selected SEA using the following inclusion criteria:

- Females aged 15 to 49 years or males aged 15 to 59 years.
- Being a permanent resident of a household or having spent the night before in the household.

Sample Size

A target sample size of 2,700 respondents (1, 800 women and 900 men) was determined to detect a 10 percent reduction in high-risk sexual behavior (sex with a non-marital, non-cohabiting partner) between rounds of surveys. The 2007 ZDHS reported high-risk sexual behavior to be 17 percent in females and 35 percent in males; thus, 1,800 women and 900 men were required to detect a 10 percent reduction in this behavior from the ZDHS reported prevalence. Households and household members were selected randomly from SEAs that were selected randomly at baseline. The target sample size allocated to each province was proportionate to the population of the province. The midline survey was implemented in the same SEAs as the baseline with the exception of a few that were impassable during the mapping for midline. These SEAs were replaced by an adjacent SEA. The midline survey team interviewed 1,437 females and 750 males (80 and 83 percent of the target sample size, respectively) between August and September 2013.

Data Collection

Maps and household listings of the SEAs in the districts of operation of ZPI were obtained from the Central Statistical Office (CSO). A team of enumerators made advance visits to the randomly selected SEAs to update the household listings. Eligible females were randomly selected from the updated household listing. Since the required sample size of females was twice that of males, a male respondent was randomly selected from every other household where a female was randomly selected using a Kish Grid.

The midline survey consisted of a behavioral questionnaire (one for females and one for males) and a household questionnaire. Face-to-face interviews were conducted by interviewers using a handheld PDA and responses were entered on the same PDA. The teams of interviewers were introduced to households by a local community guide. In the case of legal minors (under 16 years of age in Zambia), consent for their participation was obtained from their parents or legal guardians followed by the minor's assent.

Data Analysis

Data was analyzed in STATA version 12.1. The sample at midline was weighted for the baseline age structure to account for the difference in age between the two samples. The median age at midline was much younger than the baseline sample for both males (23 versus 28 years) and females (24 versus 26 years). To reconcile this, weights were generated for age and applied to midline indicators compared to their baseline equivalent. The age difference across data collection rounds may be due to the fact that the midline data collection was conducted closer to the fishing and farming seasons; thus, possibly more adults were out of the households while younger persons were left behind. Continuous variables were compared using Student's t-test and categorical variables with Pearson's chi-square test. Comparisons were made between baseline and midline as well as between exposed and unexposed to programs among midline participants. Variables were considered significant at $p < 0.05$ (two-tailed).

Limitations

A limitation of the midline study was the cross-sectional nature of the design, which limits the ability to make any causal inferences. Despite this, an understanding of associations is valuable for targeting programs.[6] Additionally, the samples at midline showed a disproportionate percentage of younger participants, particularly among males. To reconcile this, weights were generated for age and applied to midline indicators compared to their baseline equivalent. Tables and figures note when weights were applied. Lastly, because ZPI is not a branded intervention (i.e., an intervention with a unique logo or design intended to identify the services) and works through a multitude of community-based organizations, there was no simple way to assess exposure to the ZPI program. Other local CBOs that were not part of ZPI may have been implementing similar HIV prevention programs. Hence, exposure to interventions in this study may reflect exposure to other HIV prevention interventions.

[6]See ZPI baseline report for additional limitations resulting from baseline data collection.

Results

SAMPLE CHARACTERISTICS

All tables referenced in the report are in the Appendix. At baseline, a total of 845 males and 1,594 females completed the survey. At midline, 750 males and 1,437 females completed the survey.

Table 1 describes background characteristics of the study sample at baseline and midline. The weighted median age at baseline and midline was 28 (males) and 26 (females). Midline participants were significantly more likely to be never married compared to the baseline sample for both males (42 percent versus 32 percent; $p < 0.001$) and females (35 percent versus 28 percent; $p < 0.05$). There was no significant difference in residency between baseline and midline for males and females; approximately one-third were urban residents.

EXPOSURE TO HIV PREVENTION INTERVENTIONS

Various prevention interventions, listed in Figure 1, were delivered either through one-on-one interactions or via small group-based activities (maximum 25 people). Participants were more commonly exposed to one-on-one interactions (range: 9–56 percent) than group-based activities (range: 7–31 percent)[7] (Table 2). The most commonly reported information they learned though one-on-one interaction or group-based activities was about HIV and AIDS prevention, HTC and referral for ART, PMTCT, male circumcision, and family planning (30–55 percent for one-on-one interactions and 15–30 percent for group-based activities). Eastern province had the highest proportion of participants who indicated learning about these topics (15–76 percent through one-on-one and 8–41 percent through group-based activities) while Luapula had the lowest proportion (2–20 percent for one-on-one and 2–6 percent for group-based activities). The lack of exposure in Luapula is due to the fact that ZPI had not rolled out interventions in the sampled districts (Mwense and Kawambwa) in Luapula; much of the ZPI activities in Luapula had taken place in the fishing district of Samfya.

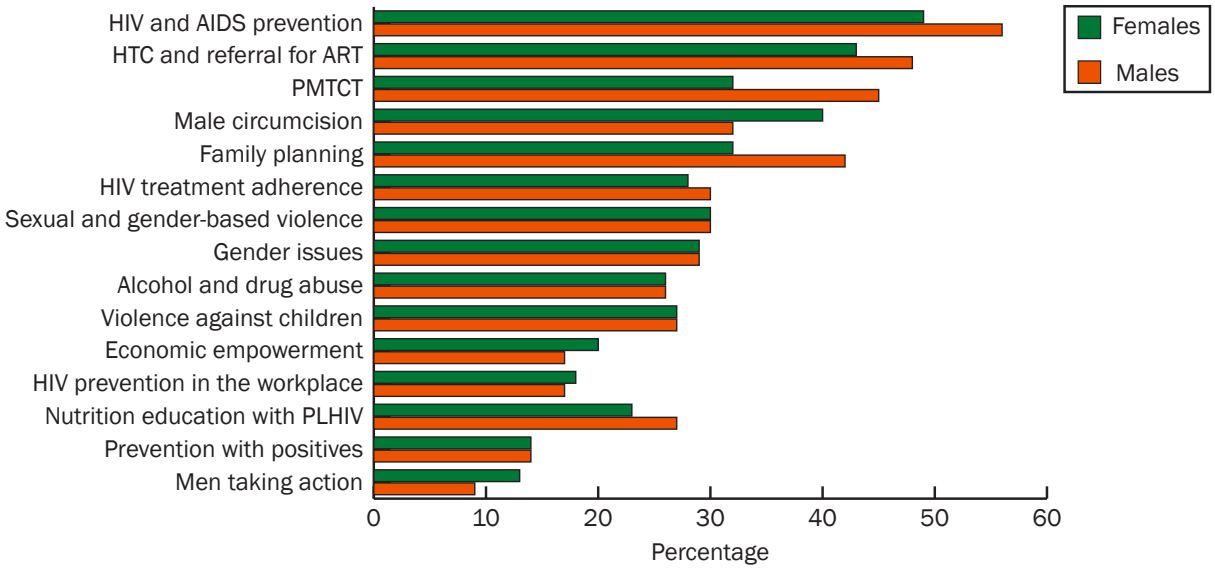
For the purpose of this analysis, exposure to HIV prevention intervention was defined as being exposed to at least one one-on-one interaction and one group-based activity. Based on this definition, approximately 39–48 percent were exposed in Eastern, 31–35 percent in Copperbelt and Western, and 4–6 percent in Luapula. Exposure to prevention interventions did not differ significantly by sex (both 29 percent), age, or marital status. (Table 3)

Participation in economic empowerment activities includes participating in at least one of the following: income generation training, financial management and savings education and training, savings and loans groups, and career development programs. Approximately 8–13 percent of males and 7–12 percent of females participated in ZPI income generation activities with the exception of those in Luapula (1–2 percent).[8]

[7]Most of ZPI's prevention work occurs through small group discussions. However, the high proportion of exposure through one-on-one interactions could have occurred through HIV testing and counseling.

[8]Although this is a low percentage in terms of coverage, ZPI has to date (through September 30, 2013) established a membership of 2,505 females and 286 males through its GROW program.

FIGURE 2 EXPOSURE TO HIV PREVENTION INTERVENTIONS IN THE PAST YEAR AMONG MALES AND FEMALES VIA ONE-ON-ONE INTERACTIONS



KEY OUTCOMES

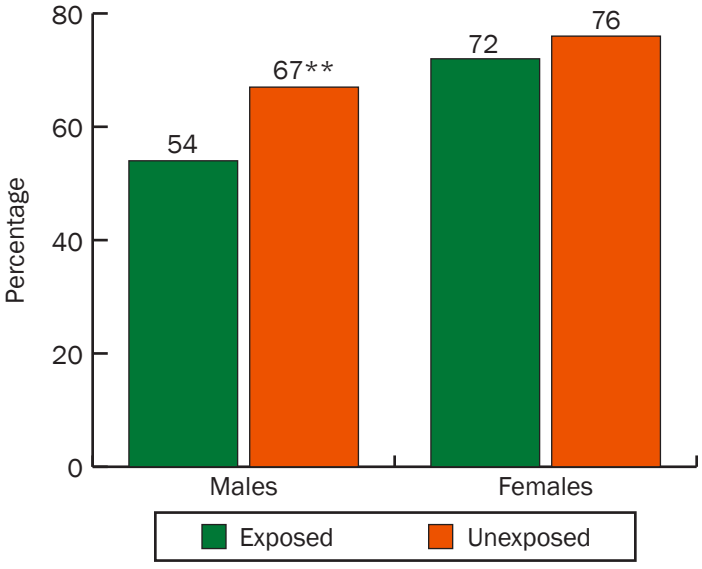
HIV testing and receiving results

HIV testing increased significantly from baseline to midline in both males and females in Eastern (males: 65 percent to 82 percent; females: 76 percent to 85 percent) and Western (males: 40 percent to 71 percent; females: 63 percent to 89 percent) provinces. Additionally, males who were exposed to HIV prevention interventions were more likely to have been tested compared to those not exposed (67 percent versus 54 percent: $p<0.01$). There was no difference by exposure among females (Figure 3).

HIV knowledge

Comprehensive HIV knowledge[9] varied greatly at baseline, from as low as 21–37 percent in Eastern and Western provinces to 49–58 percent in Copperbelt (Table 4). Overall, the proportion with comprehensive knowledge increased

FIGURE 3 PERCENT OF MALES AND FEMALES EVER TESTED FOR HIV AND RECEIVED RESULTS AT BASELINE AND MIDLINE AND BY EXPOSURE



**p<0.01

[9]Comprehensive HIV and AIDS knowledge was defined as: i) knowing that both condom use and limiting sex partners to one uninfected partner are HIV prevention methods; ii) being aware that a healthy-looking person can have HIV; and iii) rejecting the common misconceptions that HIV and AIDS can be transmitted through supernatural means or mosquito bites.

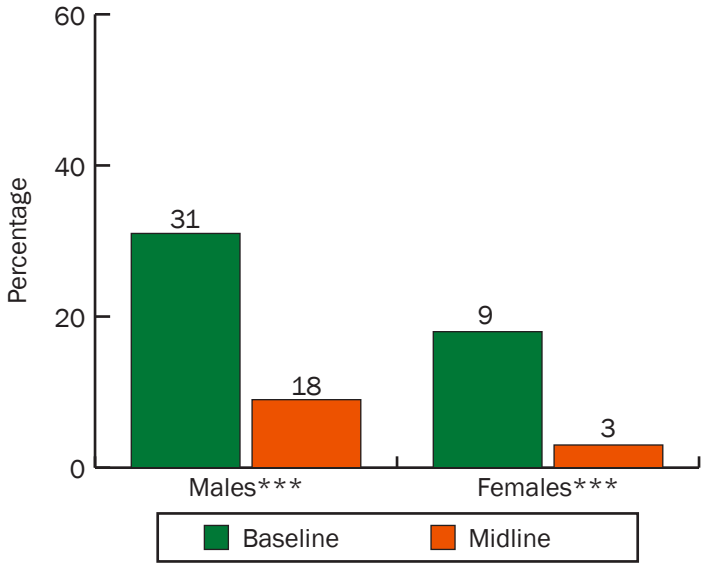
significantly from baseline to midline (males: 47 percent to 53 percent; females: 35 percent to 45 percent); however, comprehensive HIV knowledge remained low in Western at midline (19–22 percent). There was no difference by exposure to HIV prevention interventions.

Risky sexual behaviors

Findings are mixed with regard to risky sexual behaviors. First, there was no differences in the level of early sexual debut[10] among adolescents from baseline to midline (approximately 20 percent in males and 10–15 percent in females) or by exposure status. Of note, Western province had the highest level of early sexual debut among adolescent boys (28 percent) and girls (24 percent) at midline, while other provinces had rates between 7 to 20 percent.

Second, there were significant reductions from baseline to midline in the proportion of both males (31 percent to 18 percent; p<0.001) and females (9 percent to 3 percent; p<0.001) who reported multiple sex partners[11] in the last 12 months; there was no difference by exposure status (Figure 4). However, condom use at last sex with the last partner among those who had multiple partners was fairly high (71 percent in both males and females). Although there is no information on condom use among those with multiple sex partners at baseline, the 2007 ZDHS reported it to be 27 percent among males and 33 percent among females. Again, however, condom use at last sex with last partner among those who had multiple partners did not differ between exposed and unexposed groups (72–75 percent).

FIGURE 4. PERCENT OF MALES AND FEMALES HAVING MULTIPLE SEX PARTNERS IN THE LAST 12 MONTHS AT BASELINE AND MIDLINE



*** p<0.001

Lastly, the proportion of respondents reporting non-regular partnerships in the previous 12 months varied greatly by province. It increased among males from baseline to midline in Copperbelt (37 percent to 55 percent; p<0.01)[12], but decreased among males in Eastern (35 percent to 19 percent; p<0.05) and remained steady in Luapula (13–14 percent) and Western (53–59 percent). Moreover, among males in Copperbelt only, those who were exposed to HIV interventions were more likely to report non-regular partnerships compared to those unexposed (57 percent versus 45 percent; p<0.05). Among females, non-regular partnerships remained steady from baseline to midline in all provinces except Western, where it decreased from 51 percent to 38 percent (p<0.01).

Despite the mixed findings related to non-regular partnerships, condom use with the last non-regular sex partner increased significantly from baseline to midline in both males (23 percent to 60 percent; p<0.001) and females (38 percent to 49 percent; p<0.05) in all provinces (Figure 5), and was higher among those exposed compared to those

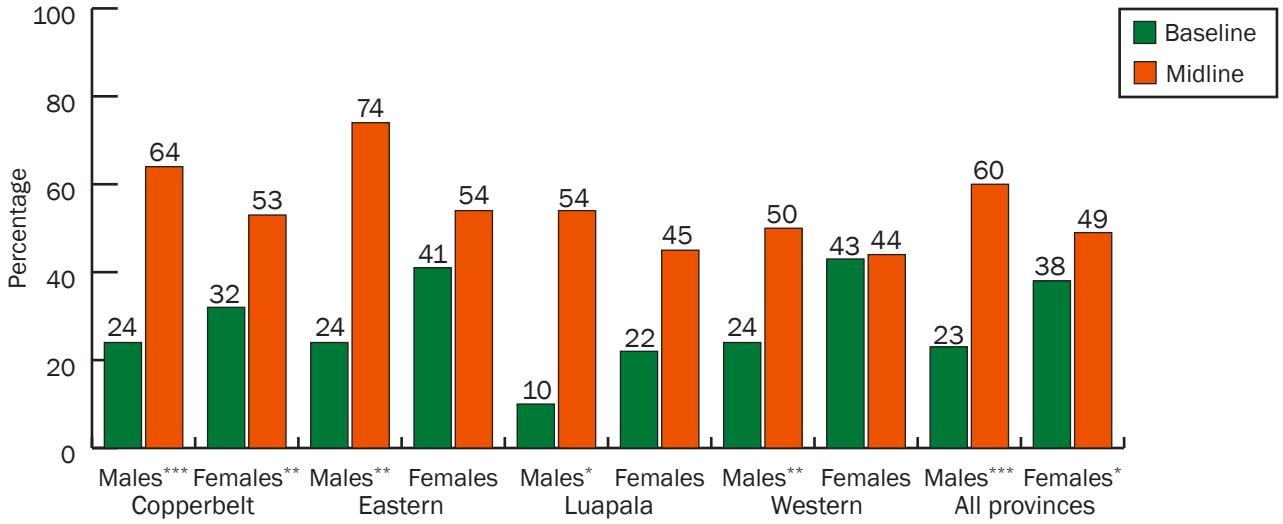
[10]Early sexual debut was defined as engaging in sex before the age of 15 among 15 to 24 year olds.

[11]Multiple partnerships may include both regular and non-regular partners.

[12]This may be a result of higher proportion of midline respondents in Copperbelt being unmarried compared to the baseline sample.

unexposed (72 percent versus 53 percent; p<0.01) among males. Indeed, the increased condom use is supported by the fact that in all provinces, there was an increase in the proportion who indicated that they could get condoms if they wanted to in both males (72 percent to 90 percent; p<0.001) and females (57 percent to 66 percent; p<0.001). However, it was not associated with exposure in any of the provinces.

FIGURE 5 PERCENT OF MALES AND FEMALES WHO USED A CONDOM WITH THE LAST NON-REGULAR PARTNER AMONG THOSE WHO HAD A NON-REGULAR PARTNER IN THE LAST 12 MONTHS AT BASELINE AND MIDLINE

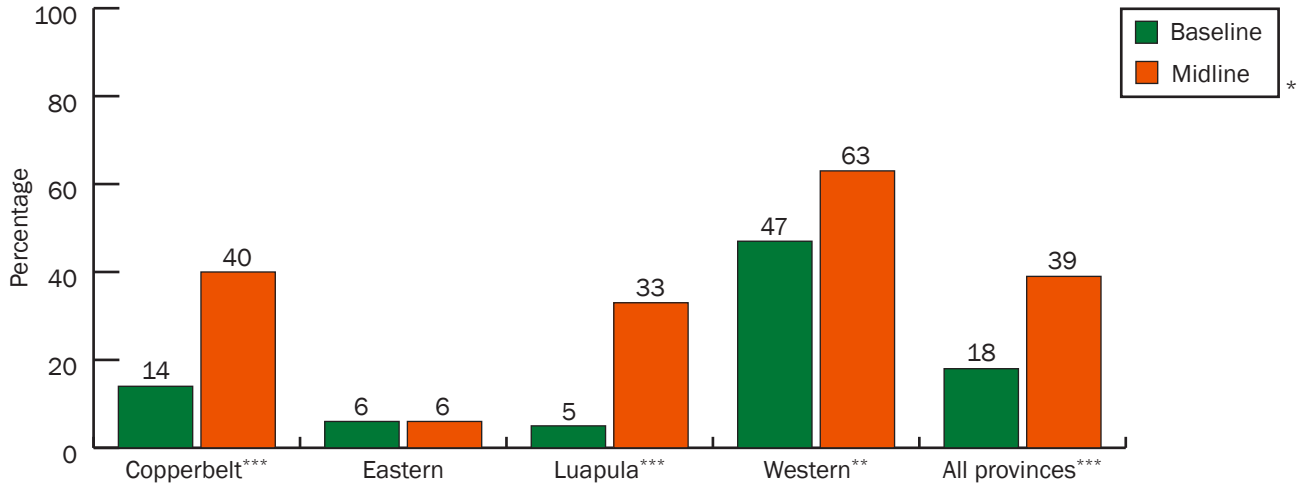


*p<0.05; ** p<0.01; *** p<0.001

Medical male circumcision

Male circumcision rates varied greatly across provinces. It increased significantly from baseline to midline in all provinces except Eastern where it remained at 6 percent (Figure 6). While Western province had the highest circumcision prevalence (63 percent at midline), the greatest increase from baseline to midline was seen in Luapula, where circumcision prevalence went from 5 percent to 33 percent. There was no difference by exposure status.

FIGURE 6 PERCENT OF MALES REPORTING THAT THEY ARE CIRCUMCISED AT BASELINE AND MIDLINE



p<0.05; ** p<0.01; *** p<0.001

Clinical alcohol problem

At baseline, clinical alcohol problems[13] were the highest in males in Copperbelt and Eastern provinces. However, improvements were seen only in Copperbelt in both males (39 percent to 30 percent; p<0.05) and females (13 percent to 8 percent; p<0.01). Further, in Copperbelt, women who were exposed to HIV prevention programs were more likely to have a clinical alcohol problem compared to those not exposed (6 percent versus 11 percent; p<0.01), which likely indicates that the programs are reaching those who need the interventions. In Eastern province, clinical alcohol problems remained extremely high at 36–47 percent in males.

Gender-based violence

Table 5 presents results related to gender-based violence. Experience of any physical violence[14] in the past 12 months increased significantly among females in Copperbelt (3 percent to 7 percent; p<0.01) and Luapula (4 percent to 8 percent; p<0.05), and remained consistently high among females in Eastern (8–11 percent) from baseline to midline. Experience of sexual violence[15] was reported by only a small number of participants. Support of rape myths[16] decreased overall among males (46 percent to 35 percent; p<0.001) and females (40 percent to 28 percent; p<0.001) from baseline to midline.

[13]Alcohol Problem: Alcohol abuse was assessed using the CAGE 4-item questionnaire Ewing, J. A. (1984). "Detecting alcoholism. The CAGE questionnaire," *JAMA* 252(14): 1905–1907. The items include feeling the need to cut down on drinking, being annoyed by people criticizing drinking, feeling guilty about drinking, and needing an eye-opener first thing in the morning. An affirmative response on two or more of the items was considered to be a clinically significant alcohol problem.

[14]Physical violence was defined specifically as having been kicked, dragged, beaten, choked, burned, or threatened with a gun, knife, or other weapon.

[15]Sexual violence was defined as having been forced in any way to have sexual intercourse or perform any sexual acts.

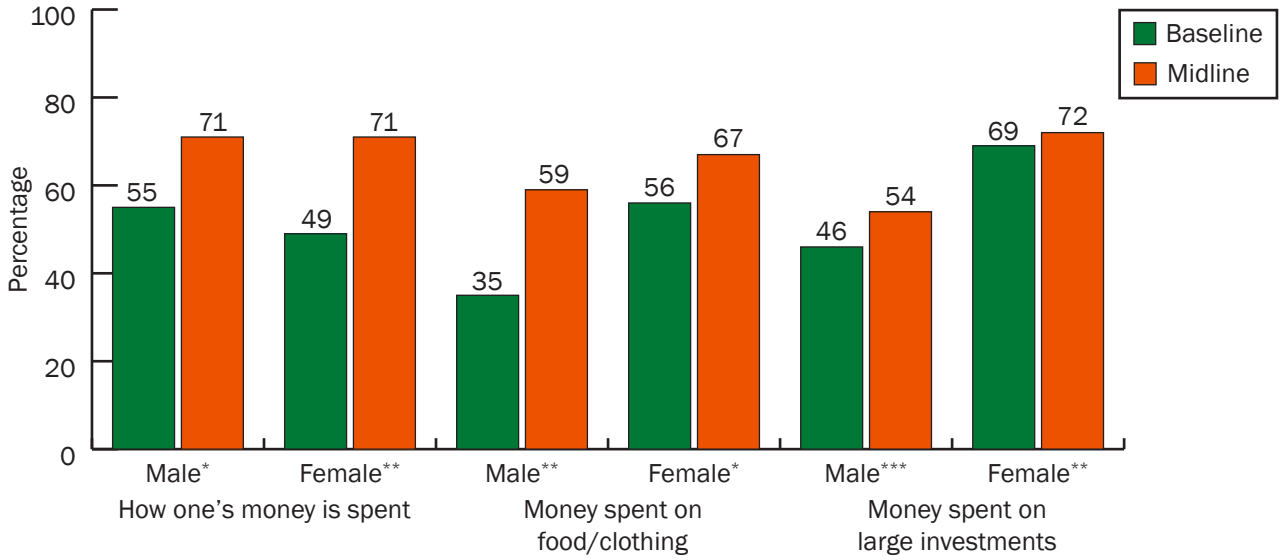
[16]Participants were asked the level of agreement to four myths about rape, which were statements that essentially blame women for the sexual violence they experience, such as "If a woman doesn't fight back, you can't really say it was rape."

Gender equitable norms

Attitudes toward gender relations were measured using 15 items adapted from the Gender Equitable Men scale.[17] A typical item in the scale is, "A man should have the final word about decisions in his home" or "A woman should tolerate violence in order to keep her family together." Table 5 presents results related to gender equitable norms. While support of inequitable gender norms increased significantly among females in Copperbelt (19 percent to 30 percent; p<0.001) and Western (37 percent to 55 percent; p<0.001), those who were exposed to HIV prevention activities were significantly less likely to support inequitable gender norms compared to those not exposed among males (17 percent versus 34 percent; p<0.001) and females (19 percent versus 34 percent; p<0.001) in Copperbelt.

We also assessed decision-making power related to how one's earning is used, health care, food and clothing, daily purchases, and large investments (i.e., house, car) to see if there were increases in joint decision making or self-decision making (women only) among those who were cohabiting or had a spouse. Copperbelt was the only province with an increase in joint decision making regarding how earnings are used and money is spent on food/clothing and large investments among both males and females (Figure 7). There was no clear meaningful finding on these indicators in the other three provinces.

FIGURE 7 PERCENT OF MALES AND FEMALES IN COPPERBELT WHOSE FINANCIAL DECISIONS WERE MADE JOINTLY AT BASELINE AND MIDLINE



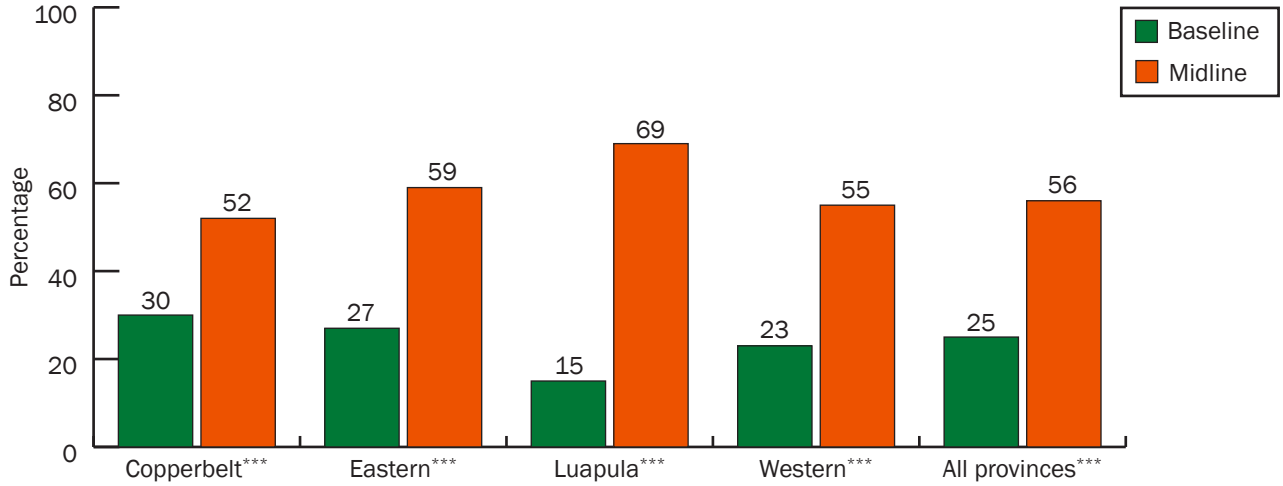
*p<0.05; ** p<0.01; *** p<0.001

Unintended pregnancies and contraceptive use

In all four provinces, there were significant increases in contraceptive use to delay pregnancy (25 percent to 56 percent; p<0.001; Figure 8). This supports the finding of reduced prevalence of unintended pregnancies that was also observed in the four provinces (50 percent to 39 percent; p<0.001; Figure 9. However, neither of these indicators was associated with exposure to HIV prevention interventions.

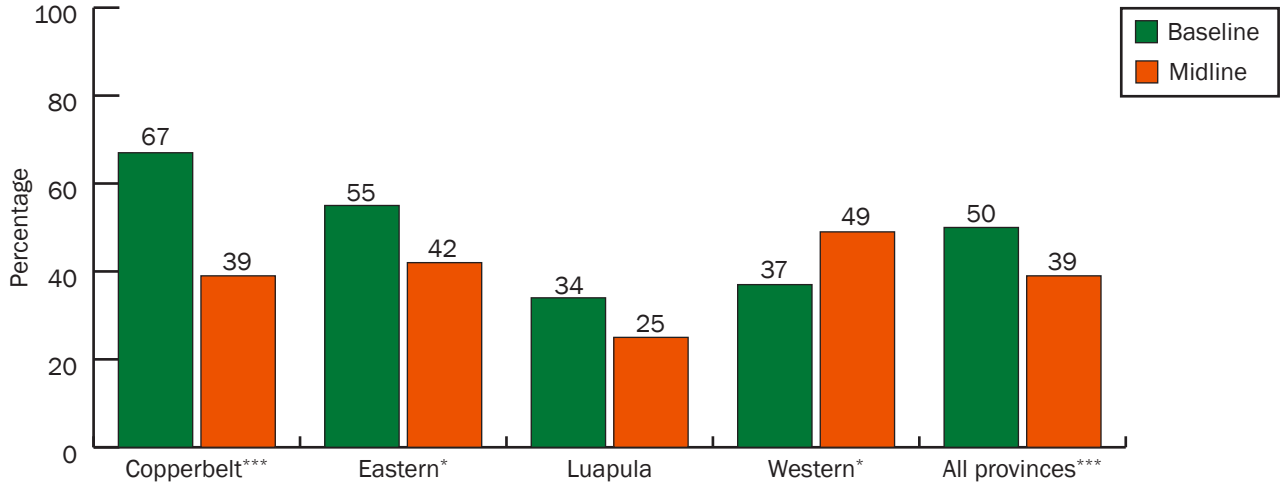
[17]Gender equitable norms was measured using the Gender Equitable Men (GEM) Scale.Pulerwitz, J. and G. Barker. 2008. "Measuring attitudes toward gender norms among young men in Brazil: Development and psychometric evaluation of the GEM scale," *Men & Maculinities* 10: 322–338.

FIGURE 8 PERCENT OF FEMALES REPORTING CURRENTLY USING CONTRACEPTIVES TO DELAY PREGNANCY AT BASELINE AND MIDLINE



*** p<0.001

FIGURE 9 PERCENT OF FEMALES REPORTING THAT THEIR LAST PREGNANCY WAS UNINTENDED AT BASELINE AND MIDLINE



* p<0.05; *** p<0.001

Economic empowerment

The proportion of participants earning money was compared between those participating specifically in economic empowerment activities[18] and those who were not. Baseline results are not reported here as the baseline survey's assessment of "earning" differed from that of the midline survey (the baseline included both cash as well as in-kind

[18]Exposure to economic empowerment activities includes participating in at least one of the following activities: i) income generation training; ii) Financial management and savings education and training; iii) savings and loans group; and iv) career development programs.

earnings while the midline survey was based solely on cash earnings). Based on the midline survey data, those who were exposed to income-generating activities were significantly more likely to be earning money compared to those not exposed among both males (52 percent versus 43 percent; borderline significant) and females (40 percent versus 25 percent; $p<0.001$).

Conclusion and Recommendations

In summary, many positive changes were observed between the two years from baseline to midline surveys. There were improvements in HIV knowledge, HIV testing, access to condoms, condom use, gender norms attitudes, medical male circumcision, women's financial decision making, contraceptive use, and decreases in unintended pregnancies.

Comprehensive HIV knowledge rates increased in all provinces except Western. It should be noted, however, that ZPI interventions did not start in Western province until July/August 2013, which might help to explain the low rates of HIV knowledge. This may suggest that ZPI influenced the improvements in HIV knowledge in the remaining provinces. It will be interesting to determine changes in levels of knowledge after more time in Western province.

HIV testing rates increased only in Eastern and Western provinces; midline rates were over 80 percent. However, they remained low in Copperbelt and Luapula where only about half of males and two-thirds of females reported ever having been tested at midline. Our results do indicate that males exposed to HIV prevention interventions were more likely to be tested for HIV. It is likely that ZPI contributed to this effect. A total of 97,043 individuals were tested and received their test results through ZPI in 2013 alone (which is 194 percent of the 2013 target). Promotion of HIV testing should be strengthened in Copperbelt and Luapula, particularly among men.

Previous studies have found that early sexual debut is associated with risky sex, pregnancy, and increased HIV and STI risk (Duncan et al. 1990, Greenberg et al. 1992, Laga et al. 2001, Pettifor et al. 2004, Kaestle et al. 2005). The rates of early sexual debut found in this evaluation remain similar to the 2007 ZDHS, which reported 14 percent in females and 16 percent in males. Hence, ZPI should strengthen its programs to reach adolescent boys and girls to encourage delaying sex. A priority should be youth-centered behavioral risk reduction programming, and interventions should include life skills and HIV prevention programs in schools and out of school to promote delayed sexual debut. Programs should also promote positive communication with children on sexuality and HIV, and improve/provide youth-friendly sexual health services.

Overall, there were improvements in sexual risk behaviors. There were reductions in the proportion having multiple sex partners as well non-regular partners. Condom use results are also encouraging; a high proportion of those who had multiple partners reported using condoms, and there was an increase from baseline to midline in condom use among those who reported having sex with non-regular partners. It is also encouraging that there was a significant increase in the proportion reporting that they can access condoms whenever they wanted, although this proportion was much lower in women. ZPI implements HIV prevention interventions, including activities aimed at reducing risky sexual behaviors among a variety of target populations: in- and out- of-school youth, prisoners, bus/taxi drivers, market vendors, fishermen, truckers, sex workers, and uniformed personnel. In 2013 alone, ZPI reached 66,181 individuals with interventions focused on abstinence and being faithful (147 percent of its 2013 target). ZPI likely made a contribution to the reductions in risky sexual behaviors. The availability of female condoms needs to increase, and ZPI should develop innovative ways to improve condom access for women.

Condom distribution programs and IEC related to condom use seem to be improving men's access to and use of condoms. In fact, from baseline to midline, there was an increase in the proportion of men reporting they could get condoms if they wanted to, and men exposed to HIV prevention programs were more likely to have used a condom at last sex with a non-regular partner. To this effect, ZPI has been conducting demonstrations of correct and consistent use of condoms and promoting condom use. Again, this points to ZPI's contribution to increasing condom access and usage, particularly among men. Therefore, condom distribution and behavior change messages around condom

use should continue with equal vigor and quality. As previously mentioned, ways to increase women's access to condoms are needed.

Medical male circumcision is still one of the best known methods to reduce the risk for acquiring HIV in men. While we saw increases from baseline to midline in male circumcision prevalence in Copperbelt, Luapula, and Western provinces, there was no increase in Eastern, and it remained extremely low (approximately 6 percent). This is in line with the ZDHS 2007; the low prevalence is likely due to strong traditional beliefs among certain tribes. Programs will need to determine how best to tailor the approach for promoting circumcision among men in Eastern province taking into account the local cultural/tribal context.

Alcohol abuse remains high among men in both Copperbelt and Eastern provinces. Programs will need to continue to address this issue, particularly in Copperbelt and Eastern provinces. Given the potential to reach a lot more men, alcohol risk screening and reduction counseling could be an integral part of HIV counseling sessions. ZPI has provided the CAGE screening questionnaires to implementing partner organizations along with alcohol and drug risk reduction training.

HIV prevention programs appear to be having a positive effect on attitudes related to gender norms, as those who were exposed to HIV prevention programs were less likely to support inequitable gender norms. ZPI has contributed significantly to this effort. For example, provincial teams and partner organizations work to ensure gender sensitive programming across the project. Interventions target men and boys and include activities such as conducting discussions on gender, masculinity, and power, as well as the promotion of male involvement in PMTCT. Anecdotal reports from the Mwenda Chiefdom indicate that the perception of gender roles in the community have started to change—men were assisting in drawing water and cooking, which was considered taboo in the past. ZPI should continue its efforts to reach men and women with programs that promote positive gender norms.

It is difficult to determine whether the increase in reported gender-based violence is a real increase in incidents or an artificial increase resulting from greater reporting. It may well be the latter, as reporting of GBV cases typically goes up when people become aware of an issue. ZPI has conducted numerous activities related to raising awareness about GBV. For example, ZPI led GBV and HIV prevention activities for bus and taxi drivers at bus stations, boys and young men from the Boy Empowerment project, women and youths in the State Lodge, and other sectors of the population such as farmers, traders, and constructions workers. ZPI has also formed Village Anti-GBV Committees to address GBV at the chiefdom level; these link to the district and provincial GBV Committees. By September 2013, ZPI had reached a total of 94,500 individuals with interventions that explicitly addressed GBV (88 percent of its life of project target). Additionally, in recent years in Zambia, there has been progress with the support at the national level for protecting women and young girls. In 2011, illustrating the Zambian government's long-standing commitment to responding to sexual and gender-based violence, the Anti-GBV Act was passed. Further, in 2012, the Gender and Development Division under the Office of the President released the national guidelines for the management of cases of violence. The guidelines integrate medical, legal, and psychosocial responses to GBV. Multisectorial GBV committees—at the national and decentralized levels—facilitated the formation and resuscitation of Committees where they had not been formed or where they had become dormant. Based on ZPI's anecdotal reports from the field, couples who indicated experiencing GBV have started opening up with regard to the problems they are facing in their marriages. They are beginning to seek help and support from older community members, especially those who are in the Anti-GBV committees. With these actions, more people are recognizing acts of GBV and reporting them, thus potentially explaining the increase seen in these data.

There is increased understanding that women's economic vulnerability and economic disparities between women and men in many high-prevalence countries increases women's vulnerability to HIV through various channels such as increased high-risk behaviors and vulnerability to GBV, limitations on women's ability to negotiate safer sex, and increased dependence on transactional sex. There is evidence that programs that promote economic empowerment

combined with HIV prevention offer strategic opportunities to get people involved in HIV prevention programs and may contribute to reductions in HIV risk behaviors (Kim et al. 2008, Pronyk et al. 2008). One part of ZPI's mandates is to economically empower Zambian women, but ZPI recognizes that economic approaches alone will not likely decrease HIV risk per se. Thus, ZPI's *Grow* intervention links economic empowerment activities with HIV prevention. By September 2013, it reached 5,944 adults and children with economic strengthening services. Through the *Grow* program, 160 Grow Groups for economic empowerment has been created with a membership of 2,505 females and 286 males. The Grow Groups together has a savings of 40,656 Kwacha (approximately USD 7,000) and has provided 182,585 Kwacha (approximately USD 31,300) in loans. Income-generating activities appear to be having a positive impact on people's earning capacity. Those who were exposed to income-generating activities were significantly more likely to be earning money compared to those not exposed among both males and females. This was most pronounced in Eastern province where those exposed were two times more likely to be earning money compared to those not exposed. Eastern province is also where ZPI's GROW program has been the most active, with 1,800 members (which is 64 percent of all GROW members). Thus, the exposure effect seen in the survey findings is supported by the program implementation data. While income-generating activities increased, there should be increased efforts to improve financial decision-making among couples. Only Copperbelt province showed increases in joint financial decision-making related to one's income, daily purchases such as clothing and food, and large investments.

In conclusion, these are encouraging trends. In some cases, we found the greatest improvements in outcome indicators in provinces where ZPI has had greater coverage and time to implement (Eastern and Copperbelt) with minimal improvements in the province where ZPI just started activities (Western). These data and findings are good indications that ZPI activities have positively influenced behaviors and attitudes related to HIV prevention. In light of the conceptual framework for ZPI, these achievements in the intermediate results of the program are expected to lead to a sustainable impact of reduced HIV transmission.

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Appendices

TABLE 1 Background characteristics of the study sample at baseline and midline for males and females

Background characteristics	Males			Females		
	Baseline (n=845) %	Midline* (n=750) %	p-value	Baseline (n=1,594) %	Midline* (n=1,437) %	p-value
Median age (IQR) with unweighted midline	28 (21-38)	23 (18-34)		26 (20-34)	24 (19-33)	
Median age (IQR) with weighted midline	28 (21-38)	28 (20-38)		26 (20-34)	26 (20-34)	
Age groups with unweighted midline						
15–19	21 (174)	32 (243)	<0.001	20 (324)	28 (405)	<0.001
20-24	17 (140)	20 (146)		22 (351)	23 (334)	
25-29	16 (131)	12 (92)		19 (304)	14 (198)	
30-34	14 (120)	11 (82)		14 (218)	13 (178)	
35-39	12 (104)	8 (57)		12 (193)	10 (146)	
40+	21 (176)	17 (130)		13 (204)	12 (176)	
Age groups with weighted midline						
15–19	21 (174)	21 (154)	1.0	20 (324)	20 (292)	1.0
20-24	17 (140)	17 (124)		22 (351)	22 (316)	
25-29	16 (131)	16 (116)		19 (304)	19 (274)	
30-34	14 (120)	14 (106)		14 (218)	14 (197)	
35-39	12 (104)	12 (92)		12 (193)	12 (174)	
40+	21 (176)	21 (156)		13 (204)	13 (184)	
Education completed						
No education	6 (49)	5 (34)	0.135	11 (179)	7 (102)	<0.001
Primary	33 (272)	29 (219)		44 (690)	42 (597)	
Secondary	55 (463)	61 (457)		41 (650)	48 (685)	
More than secondary	6 (52)	5 (39)		4 (58)	4 (52)	
Marital status						
Never married	32 (189)	42 (316)	<0.001	28 (336)	35 (502)	<0.05
Married/Living together	65 (384)	55 (410)		61 (723)	54 (777)	
Divorced/Sep'd/Wid'd	3 (15)	3 (24)		10 (123)	11 (158)	
Residence						
Urban	36 (302)	32 (239)	0.103	34 (545)	35 (501)	0.697
Rural	64 (543)	68 (511)		66 (1,049)	65 (936)	
Province						
Copperbelt	37 (313)	47 (353)	<0.001	36 (569)	46 (660)	<0.001
Eastern	17 (145)	13 (100)		20 (325)	14 (200)	
Luapula	22 (187)	18 (137)		21 (326)	18 (260)	
Western	24 (200)	21 (160)		23 (374)	22 (317)	

*Midline variables are weighted to baseline age distribution

TABLE 2 Exposure to HIV prevention interventions in the past one year among males and females at midline

	Copperbelt		Eastern		Luapula		Western		Total	
	Male (n=385) %	Female (n=677) %	Male (n=83) %	Female (n=194) %	Male (n=123) %	Female (n=255) %	Male (n=159) %	Female (n=311) %	Male (n=750) %	Female (n=1,437) %
Learned about following from peer educator or counselor (one-on-one)[a]										
HIV and AIDS prevention	52 (200)	64 (434)	76 (63)	73 (141)	19 (23)	18 (47)	53 (84)	56 (175)	49 (370)	56 (797)
HTC and referral for ART	44 (171)	54 (362)	75 (62)	69 (133)	20 (24)	17 (44)	39 (62)	48 (149)	43 (319)	48 (688)
PMTCT	35 (134)	50 (341)	57 (47)	62 (120)	11 (13)	15 (37)	31 (49)	47 (147)	32 (243)	45 (645)
HIV treatment adherence	26 (99)	31 (211)	65 (54)	56 (109)	11 (14)	11 (27)	28 (14)	28 (86)	28 (211)	30 (433)
Nutrition education for PLHIV	22 (84)	30 (201)	43 (36)	43 (84)	7 (9)	8 (19)	27 (43)	29 (89)	23 (172)	27 (393)
HIV prevention in the workplace	17 (64)	19 (125)	45 (37)	31 (61)	7 (9)	4 (9)	16 (25)	15 (46)	18 (135)	17 (241)
Gender issues	32 (122)	35 (236)	51 (42)	39 (75)	7 (8)	7 (17)	27 (43)	28 (88)	29 (215)	29 (416)
Sexual and gender-based violence	36 (140)	40 (267)	33 (27)	36 (69)	8 (10)	6 (14)	28 (44)	28 (86)	30 (221)	30 (436)
Violence against children	32 (124)	37 (252)	33 (27)	26 (50)	7 (8)	4 (11)	25 (40)	24 (73)	27 (199)	27 (386)
Alcohol and drug misuse	34 (132)	38 (258)	28 (23)	22 (43)	4 (5)	3 (7)	24 (38)	22 (68)	26 (198)	26 (376)
Economic empowerment	26 (100)	22 (151)	24 (20)	21 (40)	3 (4)	3 (7)	16 (25)	15 (48)	20 (149)	17 (246)
Male circumcision	47 (182)	43 (290)	54 (45)	38 (74)	10 (12)	6 (14)	37 (58)	28 (88)	40 (297)	32 (466)
Men taking action	15 (56)	8 (55)	21 (17)	15 (29)	2 (2)	2 (5)	15 (23)	15 (45)	13 (98)	9 (134)
Prevention with positives	12 (46)	10 (70)	39 (32)	35 (67)	3 (4)	3 (8)	16 (26)	16 (50)	14 (108)	14 (195)
Family planning	35 (136)	47 (319)	69 (57)	70 (136)	8 (10)	9 (22)	25 (40)	40 (123)	32 (243)	42 (600)
Participated in sessions on the following issues (group-based)[b]										
HIV and AIDS prevention	34 (130)	33 (223)	41 (30)	36 (69)	4 (5)	6 (14)	40 (64)	45 (140)	31 (229)	31 (446)
HTC and referral for ART	24 (94)	24 (165)	38 (28)	37 (72)	4 (5)	6 (14)	35 (55)	37 (116)	25 (182)	26 (367)
PMTCT	15 (56)	19 (129)	27 (20)	34 (66)	3 (4)	5 (13)	24 (38)	39 (121)	16 (118)	23 (329)
HIV treatment adherence	13 (49)	13 (90)	27 (20)	28 (54)	3 (4)	3 (8)	19 (30)	24 (74)	14 (103)	16 (226)
Nutrition education for PLHIV	12 (45)	12 (80)	24 (18)	20 (39)	3 (4)	3 (8)	21 (33)	28 (86)	14 (100)	15 (213)
HIV prevention in the workplace	10 (37)	7 (46)	22 (16)	18 (34)	3 (4)	3 (7)	16 (26)	19 (58)	11 (83)	10 (145)
Gender issues	18 (70)	19 (129)	20 (15)	18 (35)	3 (4)	4 (10)	24 (38)	28 (87)	17 (127)	18 (261)
Sexual and gender-based violence	21 (79)	23 (153)	12 (9)	16 (30)	2 (3)	3 (7)	24 (38)	27 (84)	17 (129)	19 (274)
Violence against children	20 (75)	20 (133)	14 (10)	13 (25)	2 (2)	4 (9)	20 (31)	24 (76)	16 (118)	17 (243)
Alcohol and drug misuse	20 (76)	18 (124)	12 (9)	11 (21)	2 (2)	2 (5)	21 (32)	21 (64)	16 (119)	15 (214)
Economic empowerment	12 (46)	10 (69)	14 (10)	10 (20)	2 (3)	2 (6)	15 (24)	18 (55)	11 (83)	10 (150)
Male circumcision	31 (119)	20 (137)	34 (25)	18 (34)	4 (5)	3 (8)	32 (50)	23 (72)	27 (199)	18 (251)
Men taking action	7 (28)	5 (32)	10 (7)	8 (16)	2 (3)	2 (5)	15 (23)	16 (51)	8 (61)	7 (104)
Prevention with positives	9 (34)	7 (50)	24 (18)	21 (40)	2 (3)	3 (7)	16 (25)	19 (58)	11 (80)	11 (155)
Family planning	19 (72)	22 (146)	28 (21)	37 (71)	3 (4)	4 (9)	21 (33)	34 (105)	18 (130)	23 (331)

TABLE 2 Exposure to HIV prevention interventions in the past one year among males and females at midline (con't)

Exposed to HIV prevention intervention[c]	32 (123)	31 (212)	39 (32)	48 (93)	4 (5)	6 (15)	34 (55)	33 (103)	29 (215)	29 (423)
Participated in economic empowerment activities[d]	13 (49)	11 (73)	13 (11)	7 (14)	2 (3)	1 (3)	8 (12)	8 (25)	10 (75)	8 (115)

[a]These may include peer educators, Men Taking Action Champion, CATZ facilitator, GBV champions, community mobilizer, community counselor, adherence counselor, DOTS promoters, psychosocial counselors, PLA facilitators, GROW Group facilitators, GROW Group book writers, HBC groups, HIV resource persons, caregivers, community volunteer, or community leaders.

[b]These include small group discussions in schools, at work, at health clinics, prison, at ART clinics, community centers, markets, in a home or a community meeting place.

[c]Exposure is defined as being exposed to at least one one-on-one intervention and at least one group-based intervention.

[d]Exposure to economic empowerment activities includes participating in at least one of the following activities: i) income generation training; ii) Financial management and savings education and training; iii) Savings and loans group; and iv) Career development program.

TABLE 3 Midline sociodemographic comparison of those unexposed and exposed to HIV prevention interventions

Background characteristics	Males			Females		
	Unexposed (n=535) %	Exposed (n=215) %	p-value	Unexposed (n=1,014) %	Exposed (n=423) %	p-value
Median age (IQR)	24 (18-35)	23 (18-32)		24 (19-33)	24 (19-33)	
Age groups						
15–19	32 (173)	33 (70)	0.523	29 (292)	27 (113)	0.705
20-24	19 (99)	22 (47)		23 (232)	24 (102)	
25+	49 (263)	46 (98)		48 (490)	49 (208)	
Education completed						
No education	5 (24)	2 (4)	p<0.05	7 (73)	5 (22)	p<0.001
Primary	28 (150)	21 (44)		44 (443)	29 (124)	
Secondary	64 (344)	70 (150)		47 (478)	59 (250)	
More than secondary	3 (17)	8 (16)		2 (20)	6 (27)	
Marital status						
Never married	53 (282)	58 (124)	0.467	40 (402)	45 (189)	0.137
Married/Living together	45 (239)	40 (86)		50 (511)	45 (189)	
Divorced/Sep'd/Wid'd	3 (14)	2 (5)		10 (101)	11 (45)	
Residence						
Urban	29 (154)	50 (108)	p<0.001	28 (282)	53 (224)	p<0.001
Rural	71 (381)	50 (107)		72 (732)	21 (199)	

TABLE 4 HIV knowledge, testing, male circumcision and HIV-related risk behaviors among males and females by province

		Copperbelt		Eastern		Luapula		Western		Total	
		Male (n=385) % (n)	Female (n=677) % (n)	Male (n=83) % (n)	Female (n=194) % (n)	Male (n=123) % (n)	Female (n=255) % (n)	Male (n=159) % (n)	Female (n=311) % (n)	Male (n=750) % (n)	Female (n=1,437) % (n)
Comprehensive HIV knowledge	BL	58 (167) **	49 (276)***	33 (46)*	21 (66)*	46 (83)	35 (113)**	37 (77)***	28 (101)*	47 (373)*	35 (556)***
	ML	68 (239)	60 (393)	50 (49)	30 (59)	51 (70)	47 (122)	22 (36)	19 (61)	53 (395)	45 (635)
	ML-Unexp	68 (178)	56 (258)††	47 (24)	28 (28)	48 (56)	47 (113)	19 (20)	17 (36)	52 (278)	43 (435)
	ML-Exp	67 (82)	68 (141)	47 (15)	32 (30)	80 (4)	47 (7)	26 (14)	23 (24)	54 (115)	48 (202)
Ever tested for HIV	BL	54 (156)	71 (401)	65 (80)**	76 (243)*	56 (100)	65 (210)	40 (78)***	63 (228)***	53 (423)**	69 (1,082)***
	ML	58 (204)	73 (478)	82 (82)	85 (168)	46 (62)	65 (169)	71 (114)	89 (283)	62 (461)	77 (1,099)
	ML-Unexp	50 (132)	71 (327)	77 (39)	79 (79)	42 (49)	60 (145)	66 (69)	86 (178)	54 (289)††	72 (729)
	ML-Exp	58 (71)	62 (130)	84 (27)	86 (80)	80 (4)	87 (13)	76 (42)	92 (95)	67 (144)	76 (318)
Had sex before the age of 15 among youth (15-24 year olds)	BL	7 (4)	7 (11)	21 (6)	20 (17)	20 (6)	12 (10)	39 (22)	25 (33)	22 (38)	16 (71)
	ML	15 (16)	7 (13)	20 (4)	10 (7)	20 (3)	7 (4)	28 (16)	24 (23)	20 (39)	11 (46)
	ML-Unexp	15 (12)	6 (9)	14 (2)	8 (3)	19 (3)	8 (4)	27 (10)	28 (19)	19 (27)	12 (35)
	ML-Exp	16 (5)	13 (5)	40 (2)	14 (5)	0	0	35 (7)	20 (6)	25 (14)	15 (16)
Had 2 or more partners in last 12 months (among those who had sex in last 12 months)	BL	28 (43)	8 (20)*	35 (34)*	5 (6)	23 (22)**	2 (3)	37 (38)*	17 (32)***	31 (137)***	9 (61)***
	ML	20 (41)	4 (14)	19 (16)	3 (4)	8 (9)	1 (2)	24 (27)	4 (8)	18 (93)	3 (28)
	ML-Unexp	20 (31)	3 (7)†	13 (6)	5 (4)	9 (8)	1 (2)	27 (22)	4 (5)	18 (67)	3 (18)
	ML-Exp	25 (15)	9 (8)	30 (9)	1 (1)	0	0	21 (8)	4 (3)	24 (32)	5 (12)
Used condom at last sex with last partner (among those who had sex with 2+ partners in last 12 months)	BL	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]
	ML	74 (32)	77 (11)	65 (11)	37 (2)	87 (8)	100 (2)	64 (19)	73 (6)	71 (70)	71 (21)
	ML-Unexp	77 (24)	100 (7)	50 (3)	25 (1)	88 (7)	100 (2)	64 (14)	60 (3)	72 (48)	72 (13)
	ML-Exp	80 (12)	63 (5)	78 (7)	100 (1)	0	0	63 (5)	100 (3)	75 (24)	75 (9)
Had non-regular sex partner in last 12 months (among those who had sex in past 12 month)	BL	37 (40)***	25 (74)	35 (24)*	10 (18)	13 (12)	6 (11)	53 (51)	51 (108)**	31 (127)**	24 (211)
	ML	55 (113)	27 (96)	19 (16)	13 (20)	14 (15)	11 (20)	59 (66)	38 (77)	42 (210)	24 (213)
	ML-Unexp	57 (87)†	28 (75)	15 (7)	20 (16)	18 (16)	13 (21)	68 (55)	39 (55)	45 (165)†	26 (167)
	ML-Exp	72 (44)	34 (30)	33 (10)	11 (8)	0	0	58 (22)	49 (33)	57 (76)	30 (71)
Used condom with last non-regular partner (among those who had non-regular partner in last 12 months)	BL	24 (5)***	32 (23)**	25 (6)**	41 (7)	10 (1)*	22 (2)	24 (12)**	43 (46)	23 (24)***	38 (78)*
	ML	64 (83)	53 (57)	74 (13)	54 (12)	54 (9)	45 (10)	50 (36)	44 (38)	60 (142)	49 (117)
	ML-Unexp	59 (51)†	55 (41)	43 (3)	50 (8)	50 (8)	43 (9)	46 (25)	46 (25)	53 (87)††	50 (83)
	ML-Exp	77 (33)	55 (17)	78 (7)	63 (5)	0	0	60 (12)	39 (13)	72 (52)	50 (35)
Could get condoms if wanted to	BL	70 (215)***	50 (199)***	75 (106)**	59 (141)**	77 (136)*	66 (161)**	70 (135)***	56 (151)***	72 (592)***	57 (652)***
	ML	89 (290)	66 (368)	93 (89)	72 (121)	89 (95)	52 (107)	91 (133)	74 (200)	90 (607)	66 (796)
	ML-Unexp	88 (217)	62 (241)	94 (44)	68 (56)	87 (79)	50 (94)	88 (82)	71 (128)	89 (422)	62 (519)†
	ML-Exp	86 (95)	66 (121)	88 (28)	75 (61)	80 (4)	47 (6)	92 (48)	72 (63)	88 (175)	69 (251)
Circumcised	BL	14 (43)***	n/a	6 (8)	n/a	5 (9)***	n/a	47 (91)**	n/a	18 (151)***	n/a
	ML	40 (140)		6 (6)		33 (45)		63 (100)		39 (291)	
	ML-Unexp	39 (101)		6 (3)		29 (34)		64 (67)		38 (205)	
	ML-Exp	43 (53)		9 (3)		60 (3)		64 (35)		44 (94)	

Have clinical alcohol problem[b]	BL	39 (118)*	13 (73)**	36 (51)	6 (18)	21 (37)	3 (10)	22 (43)	8 (30)	30 (249)	8 (131)*
	ML	30 (107)	8 (51)	47 (47)	5 (9)	19 (26)	5 (12)	17 (27)	6 (18)	28 (207)	6 (91)
	ML-Unexp	27 (71)	6 (26) ††	35 (18)	3 (3)	18 (21)	5 (11)	11 (11)	6 (13)	23 (121)	5 (53)†
	ML-Exp	25 (31)	11 (24)	53 (17)	8 (7)	20 (1)	0	18 (10)	4 (4)	27 (59)	8 (35)

*p<0.05 comparing ML to BL; ** p<0.01 comparing ML to BL; *** p<0.001 comparing ML to BL

†p<0.05 comparing exposed to unexposed; ††p<0.01 comparing exposed to unexposed; †††p<0.001 comparing exposed to unexposed

[a]Condom use with the last sex partner at baseline may not be valid due to high proportion of missing data.

[b]Alcohol Problem: Alcohol abuse was assessed using the CAGE 4-item questionnaire Ewing, J. A. (1984). "Detecting alcoholism. The CAGE questionnaire." *JAMA* 252(14): 1905-1907.. The items include feeling the need to cut down on drinking, being annoyed by people criticizing drinking, feeling guilty about drinking, and needing an eye-opener first thing in the morning. An affirmative response on two or more of the items was considered to be a clinically significant alcohol problem.

TABLE 5 Gender-based violence and gender equitable norms

		Copperbelt		Eastern		Luapula		Western		Total	
		Male (n=385) % (n)	Female (n=677) % (n)	Male (n=83) % (n)	Female (n=194) % (n)	Male (n=123) % (n)	Female (n=255) % (n)	Male (n=159) % (n)	Female (n=311) % (n)	Male (n=750) % (n)	Female (n=1,437) % (n)
Experienced physical violence in last 12 months	BL	n/a	3 (12)**	n/a	11 (28)	n/a	4 (7)*	n/a	4 (11)	n/a	5 (58)
	ML		7 (48)		8 (16)		8 (21)		2 (7)		6 (91)
	ML-Unexp		7 (32)		10 (10)		7 (17)		2 (5)		6 (64)
	ML-Exp		6 (13)		5 (5)		13 (2)		1 (1)		5 (21)
Experienced sexual violence in last 12 months	BL	n/a	0 (2)	n/a	1 (3)	n/a	2 (3)	n/a	2 (7)*		1 (15)**
	ML		0 (3)		0		1 (2)		0		0 (5)
	ML-Unexp		0		0		1 (2)		0		0 (2)
	ML-Exp		1 (2)		0		0		0		0 (2)
Supported rape myths	BL	43 (131)**	38 (208)***	38 (54)	50 (156)***	45 (79)***	30 (92)	60 (115)**	43 (154)	46 (379)***	40 (610)***
	ML	33 (115)	22 (143)	42 (42)	33 (66)	25 (34)	23 (61)	46 (74)	39 (126)	35 (264)	28 (396)
	ML-Unexp	29 (77)	17 (81)†††	36 (18)	28 (28)	27 (31)	23 (56)	50 (52)	39 (81)	33 (178)	24 (246)†††
	ML-Exp	38 (47)	30 (63)	50 (16)	41 (38)	0	27 (4)	44 (24)	40 (41)	41 (87)	35 (146)
Supported inequitable gender norms	BL	25 (78)	19 (107)***	49 (70) 38	42 (132)	46 (81)**	60 (186)***	43 (84)	37 (135)***	38 (313)*	36 (560)
	ML	29 (102)	30 (199)	(38)	47 (93)	37 (50)	28 (72)	33 (52)	55 (173)	36 (267)	38 (537)
	ML-Unexp	34 (90)†††	34 (157)†††	35 (18)	44 (44)	30 (35)	27 (64)	47 (49)	57 (118)††	36 (192)†	38 (383)
	ML-Exp	17 (21)	19 (40)	44 (14)	50 (46)	0	13 (2)	42 (23)	51 (52)	27 (58)	33 (140)†††

*p<0.05 comparing ML to BL; ** p<0.01 comparing ML to BL; *** p<0.001 comparing ML to BL

†p<0.05 comparing exposed to unexposed; ††p<0.01 comparing exposed to unexposed; †††p<0.001 comparing exposed to unexposed

TABLE 6 Use of contraceptives and unintended pregnancy among female respondents at baseline and midline and by exposure

		Copperbelt Female (n=677) % (n)	Eastern Female (n=194) % (n)	Luapula Female (n=255) % (n)	Western Female (n=311) % (n)	Total Female (n=1,437) % (n)
Contraceptive use (currently using to delay pregnancy)	BL	30 (165) ***	27 (86) ***	15 (49) ***	23 (85) ***	25 (385) ***
	ML	52 (173)	59 (63)	69 (62)	55 (96)	56 (395)
	ML-Unexp	52 (121)	53 (27)	68 (54)	58 (64)	56 (266)
	ML-Exp	47 (48)	61 (36)	75 (6)	54 (34)	54 (124)
Unintended pregnancy	BL	67 (249) ***	55 (153) *	34 (90)	37 (95) *	50 (587) ***
	ML	39 (134)	42 (67)	25 (48)	49 (106)	39 (355)
	ML-Unexp	40 (102)	43 (36)	25 (45)	51 (75)	39 (258)
	ML-Exp	36 (33)	43 (33)	33 (3)	49 (36)	42 (105)

*p<0.05 comparing ML to BL; ** p<0.01 comparing ML to BL; *** p<0.001 comparing ML to BL

TABLE 7 Economic empowerment among married or cohabiting women

	Copperbelt				Eastern				Luapula				Western				Total			
	BL	ML	ML-Unexp	ML-Exp	BL	ML	ML-Unexp	ML-Exp	BL	ML	ML-Unexp	ML-Exp	BL	ML	ML-Unexp	ML-Exp	BL	ML	ML-Unexp	ML-Exp
Earning money	—[a]	32 (209)	27 (164)***	48 (35)	—[a]	10 (20)	10 (17)	21 (3)	—[a]	33 (86)	31 (79)	0	—[a]	26 (83)	24 (69)	32 (8)	—[a]	28 (398)	25 (329)***	40 (46)
Who decides on following issues:																				
How one's money earned is used[b]																				
Self	32 (60)**	25 (21)	25 (15)	23 (6)	15 (24)	28 (3)	60 (3)†	0	12 (17)	16 (9)	16 (8)	0	33 (34)	20 (10)	16 (5)	22 (4)	23 (135)***	21 (42)	21 (31)	19 (10)
Spouse/Partner	11 (21)	5 (4)	7 (4)	0	35 (57)	49 (5)	0	83 (5)	19 (26)	11 (6)	12 (6)	0	22 (22)	14 (7)	16 (5)	11 (2)	22 (126)	11 (22)	10 (15)	13 (7)
Jointly	49 (90)	71 (60)	68 (40)	77 (20)	50 (80)	23 (2)	40 (2)	17 (1)	69 (94)	73 (39)	72 (36)	100 (3)	45 (46)	65 (33)	68 (21)	67 (12)	52 (310)	68 (134)	68 (99)	68 (36)
Other	8 (14)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2 (14)	0	—	—
Money spent on food and clothing																				
Self	20 (46)*	15 (36)	12 (23)	23 (12)	15 (26)*	24 (30)	32 (19)†	18 (13)	21 (36)**	32 (46)	33 (45)	29 (2)	17 (19)	18 (23)	13 (11)	26 (11)	19 (127)	21 (136)	21 (98)	22 (38)
Spouse/Partner	24 (53)	18 (43)	21 (40)	9 (5)	38 (65)	43 (55)	30 (18)	52 (37)	12 (21)	23 (32)	22 (29)	29 (2)	23 (25)	27 (35)	33 (27)	19 (8)	24 (164)	26 (164)	24 (114)	40 (52)
Jointly	56 (127)	67 (163)	66 (126)	66 (35)	46 (80)	31 (40)	33 (20)	28 (20)	65 (110)	42 (60)	42 (56)	43 (3)	59 (65)	54 (68)	53 (44)	56 (24)	56 (382)	52 (330)	53 (246)	56 (24)
Someone else or self with someone else	0	1 (2)	1 (1)	2 (1)	1 (2)	3 (3)	5 (3)	1 (1)	1 (2)	3 (5)	4 (5)	0	1 (1)	1 (1)	1 (1)	0	1 (5)	2 (12)	2 (10)	0
Money spent on large investment[c]																				
Self	5 (11)**	2 (5)	1 (2)†	6 (3)	12 (21)***	1 (2)	0	3 (2)	3 (5)***	3 (5)	4 (5)	0	1 (1)	5 (6)	6 (5)	2 (1)	6 (38)***	3 (18)	3 (12)†	2 (1)
Spouse/Partner	25 (57)	24 (57)	26 (49)	17 (9)	43 (74)	47 (60)	37 (22)	54 (38)	23 (38)	22 (32)	20 (27)	57 (4)	36 (38)	38 (48)	40 (33)	37 (16)	31 (207)	31(197)	28 (131)	37 (16)
Jointly	69 (155)	72 (175)	71 (135)	72 (38)	44 (76)	35 (45)	45 (27)	27 (19)	73 (122)	59 (84)	60 (81)	29 (2)	61 (65)	55 (70)	53 (44)	58 (25)	62 (418)	58 (374)	61 (287)	58 (25)
Someone else or self with someone else	1 (2)	3 (7)	2 (4)	6 (3)	1 (1)	17 (21)	18 (11)	17 (12)	2 (3)	16 (23)	16 (22)	14 (1)	3 (3)	2 (2)	1 (1)	2 (1)	1 (9)	8 (53)	8 (38)	2 (1)
Health care																				
Self	39 (86)***	25 (117)	14 (49)†††	43 (66)	17 (31)	16 (27)*	14 (11)††	19 (16)	6 (8)***	27 (49)	27 (44)	42 (5)	25 (28)	33 (61)	38 (44)	30(18)	23 (153)***	25 (255)	21 (148)†††	34 (105)
Spouse/Partner	13 (28)	3 (13)	2 (7)	3 (5)	33 (62)	24 (40)	11 (9)	33 (28)	13 (18)	10 (18)	11 (17)	0	20 (22)	19 (35)	21 (25)	13 (8)	20 (130)	11 (106)	8 (58)	13 (41)
Jointly	46 (101)	47 (226)	54183)	23 (35)	49 (91)	53 (88)	63 (50)	39 (33)	81 (116)	57 (103)	56 (17)	42 (5)	53 (60)	45 (83)	39 (46)	48 (29)	55 (368)	50 (499)	53 (369)	33 (102)
Someone else or self with someone else	3 (7)	25 (120)	30 (102)	31 (47)	1 (2)	7 (12)	11 (9)	8 (7)	1 (1)	5 (9)	6 (10)	17 (2)	3 (3)	3 (5)	2 (2)	8 (5)	2 (13)	15 (147)	18 (123)	20 (61)
Daily purchases																				
Self	31 (68)***	16 (77)	11 (36)†††	24 (36)	19 (36)	15 (25)	18 (14)†	12 (10)	16 (23)**	27 (49)	28 (45)	25 (3)	16 (23)**	36 (67)	33 (39)	43 (26)	19 (21)***	22 (218)	19 (134)†††	24 (75)
Spouse/Partner	12 (26)	4 (21)	4 (15)	3 (5)	33 (62)	36 (61)	4 (15)	45 (38)	12 (17)	12 (21)	11 (18)	8 (1)	12 (17)	18 (34)	21 (24)	12 (7)	21 (23)	14 (136)	11 (76)	17 (51)
Jointly	51 (114)	48 (226)	52 (178)	26 (39)	46 (86)	45 (74)	52 (178)	41 (34)	70 (100)	53 (96)	52 (84)	42 (5)	70 (100)	39 (72)	39 (45)	35 (21)	56 (63)	47 (469)	50 (346)	32 (99)
Someone else or self with someone else	6 (14)	32 (152)	33 (112)	48 (73)	2 (3)	4 (7)	33 (112)	2 (2)	2 (3)	7 (13)	9 (14)	25 (3)	2 (3)	6 (12)	8 (9)	10 (6)	5 (5)	18 (184)	20 (142)	27 (84)

*p<0.05 comparing ML to BL; ** p<0.01 comparing ML to BL; *** p<0.001 comparing ML to BL

†p<0.05 comparing exposed to unexposed; ††p<0.01 comparing exposed to unexposed; †††p<0.001 comparing exposed to unexposed

[a] At baseline, earning money was not assessed. Rather earning money or in-kind earnings was assessed at baseline.

[b] Among those earning money.

[c] Large investments include car, house and appliances.

TABLE 8 Economic empowerment among married or cohabiting men

	Copperbelt				Eastern				Luapula				Western				Total			
	BL	ML	ML-Unexp	ML-Exp	BL	ML	ML-Unexp	ML-Exp	BL	ML	ML-Unexp	ML-Exp	BL	ML	ML-Unexp	ML-Exp	BL	ML	ML-Unexp	ML-Exp
Earning money	—[a]	50 (176)	42 (336)	49 (24)	—[a]	33 (33)	29 (21)	36 (4)	—[a]	63 (86)	58 (69)	100 (3)	—[a]	47 (75)	42 (62)	67(8)	—[a]	49 (371)	43 (293)	52 (39)
Who decides on following issues:																				
How one's money earned is used[b]																				
Self	20 (23)*	21 (15)	23 (13)	12 (2)	32 (21)	23 (6)	25 (4)	25 (2)	22 (10)**	43 (22)	43 (20)	75 (3)	27 (13)	37 (15)	33 (7)	39 (7)	24 (67)***	31 (57)	31 (44)	30 (14)
Spouse/Partner	24 (28)	5 (4)	4 (2)	12 (2)	9 (6)	7 (2)	13 (2)	0	11 (5)	0	0	0	10 (5)	3 (1)	0	6 (1)	16 (44)	4 (6)	3 (4)	6 (3)
Jointly	55 (65)	71 (50)	70 (39)	77 (13)	59 (38)	70 (18)	63 (10)	75 (6)	64 (29)	58 (23)	58 (27)	25 (1)	60 (29)	58(23)	67(14)	50 (9)	58 (161)	65 (121)	64 (90)	62 (29)
Other	2 (2)	3 (2)	4 (2)	0	0	0	0	0	2 (1)	0	0	0	2 (1)	2 (1)	0	6 (1)	1 (4)	1 (3)	1 (2)	2 (1)
Money spent on food/clothing																				
Self	43 (55)**	21 (20)	27(20)	23 (6)	52 (35)	47 (33)	44 (19)	64 (16)	29 (23)	20 (16)	20 (15)	20 (1)	23 (16)	41 (29)	20 (15)	63 (19)	38 (129)	31 (98)	30 (69)	49 (42)
Spouse/Partner	20 (26)	17 (17)	12 (9)	4 (1)	16 (11)	24 (17)	30 (13)	0	25 (20)	34 (27)	36 (27)		19 (13)	15 (10)	36 (27)	10 (3)	20 (70)	23 (72)	24 (55)	5 (4)
Jointly	35 (45)	59(58)	56 (42)	73 (19)	32 (22)	29 (20)	23 (10)	32 (8)	42 (33)	43 (34)	41 (31)	0	55 (38)	44 (30)	41 (31)	27 (8)	40 (138)	45 (143)	44 (102)	45 (39)
Someone else or self with someone else	2 (2)	3 (3)	5 (4)	0	0	1 (1)	2 (1)	4 (1)	4 (3)	3 (3)	3 (2)	80 (4) 0	3 (2)	0	3 (2)	0	2 (7)	2 (7)	3 (7)	1 (1)
Money spent on large investments[c]																				
Self	45 (58)***	33 (32)	35 (26) †	23 (6)	63 (43)	41 (29)	28 (12) †	64 (16)	29 (22)*	13 (10)	13 (10)	20 (1)	45 (31)**	54 (38)	48 (19)	63 (19)	45 (154)***	34 (109)	19 (67) ††	49 (42)
Spouse/Partner	9 (11)	1 (1)	0	4 (1)	2 (1)	8 (5)	14 (6)	0	7 (5)	6 (5)	7 (5)	0	2 (1)	14 (10)	18 (7)	10 (3)	5 (18)	7 (22)	8 (18)	5 (4)
Jointly	46 (59)	54 (53)	49 (37)	73 (19)	35 (24)	42 (30)	44 (19)	32 (8)	61 (46)	72 (58)	717 (53)	80 (4)	51 (35)	31 (22)	35 (14)	27 (8)	48 (164)	51 (163)	53 (123)	45 (39)
Someone else or self with someone else	0	12 (12)	16 (12)	0	0	9 (7)	14 (6)	4 (1)	3 (2)	9 (7)	9 (7)	0	3 (2)	0	0	0	1 (4)	8 (25)	11 (25)	1 (1)

*p<0.05 comparing ML to BL; ** p<0.01 comparing ML to BL; *** p<0.001 comparing ML to BL

†p<0.05 comparing exposed to unexposed; ††p<0.01 comparing exposed to unexposed

[a] At baseline, earning money was not assessed. Rather earning money or in-kind earnings was assessed at baseline.

[b] Among those earning money.

[c] Large investments include car, house and appliances.