External Evaluation of the Southern African Regional Social and Behavior Change Communication Program, as Implemented in Swaziland

Paul Hutchinson, Eva Silvestre

Philip Anglewicz, Evan Cole, and Dominique Meekers

Department of Global Health Systems and Development

Tulane University School of Public Health and Tropical Medicine

New Orleans, Louisiana, USA

June 2012

ACKNOWLEDGEMENTS

This report was written by Paul Hutchinson, Eva Silvestre, Philip Anglewicz, Evan Cole, and Dominique Meekers of the Tulane University School of Public Health and Tropical Medicine. Data were collected by Social Impact Assessment and Policy Analysis Corporation (SIAPAC), headed by Dr. David Cownie. The data collection team was led by Robin Weeks and Nosipho Dlamini. The authors would like to thank Mr. Amos Zwane, Director of Statistics, and Choice Ginindza of the Central Statistics Office, Swaziland, for their guidance with respect to the sampling, and for preparing the enumeration area maps. We are indebted to the entire team of supervisors and enumerators for their diligence and perseverance with the fieldwork. We are particularly grateful to Esca Scheepers for her comments, suggestions, and guidance with the evaluation. We thank Soul City Institute colleagues Sue Goldstein, Renay Weiner, Bongiwe Ndondo and Michael Jana, who contributed their regional experience to the evaluation, and DFID, particularly Petra Nahmias, Anna Guthrie and Dirk Mueller, for their support. We thank Lois Chingandu and Sara Page-Mtongwiza from SAfAIDS and Maserame Mojapele, the Swaziland SAfAIDS country representative; and Fortunate Thwala and Hlobisile Motsa of Lusweti for detailed information on their programs, for insightful comments on the survey instruments and procedures and for assistance with training.

ACRONYMS

ART	Antiretroviral Therapy
ARVs	Antiretroviral Drugs
CBO	Community Based Organization
CBV	Community Based Volunteer
DfID	Department for International Development
DHS	Demographic and Health Surveys
EA	Enumeration Area
GBV	Gender-based Violence
GIS	Geographic Information Systems
IKI	Invest in Knowledge
IV	Instrumental Variable
MCP	Multiple and Concurrent Partnerships
NGO	Nongovernmental Organization
PLHIV	People Living with HIV
PLWHA	People Living With HIV and AIDS
PSM	Propensity Score Matching
SADC	Southern African Development Community
SAfAIDS	Southern African HIV and AIDS Information and Dissemination Service
SBCC	Social and Behavioral Change Communication
SC IHDC	Soul City Institute for Health and Development Communication
SEM	Structural Equation Modeling
SIAPAC	Social Impact Assessment and Policy Analysis Corporation

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

EXECUTIVE SUMMARY

This report describes the findings from the external evaluation of the Swaziland component of the Southern African Regional Social and Behavior Change Communication Program (BCCP). The program, implemented in eight countries in Southern Africa with funding from the British Department for International Development (DfID), aims to reduce HIV infection by increasing health awareness and by facilitating social and behavioral change through the use of both mass media and community-based activities. In Swaziland, the program is implemented by Lusweti /Soul City and the Southern African HIV and AIDS Dissemination Service (SAfAIDS).

EVALUATION OBJECTIVE

The main objective of the evaluation is to assess the net effect of exposure to specific components of the program on key indicators of HIV knowledge, attitudes, and behaviors, after controlling for other factors or programs that might also concurrently influence or determine those outcomes. The results of the study will also be used for a separate analysis of the cost-effectiveness of the program.

DATA

The evaluation is based on a nationally representative survey of male and females aged 15-49. The survey was implemented by the Social Impact and Policy Analysis Corporation (SIAPAC) with technical support from Tulane University. The survey sample was drawn with the assistance of the Swaziland Central Statistical Office (CSO), using a three-stage sampling design that involved stratification of the population into urban, rural, and border areas. Within each of those domains, areas of concentrated programmatic activities were identified and over-sampled to increase the statistical power for measuring the effects of these localized interventions.

The data collection instrument was developed from the questionnaire used for a similar evaluation in Malawi and adapted to the Swaziland context by Tulane, SIAPAC, Lusweti and SAfAIDS. The instrument covers the eight health areas targeted by the program (multiple/concurrent sexual partnerships, other HIV risk factors, HIV communication, condom use, HIV testing, HIV treatment, HIV stigma, and gender-based violence). Approval for the study was granted by the Scientific and Ethics Committee of the Ministry of Health of Swaziland and by the Institutional Review Board of the Tulane Human Research Protection Program. Following extensive training in survey procedures and objectives, questionnaire content, and ethical conduct of research, fieldwork was conducted in 125 enumeration areas (EAs) by eight field teams, comprised of a supervisor and four enumerators. In total, 3,972 interviews were successfully completed.

METHODS

This evaluation uses a post-only cross-sectional design, given the national scope of the program. Multivariate statistical methods are used to control for differences between individuals who are exposed to the intervention and those individuals who are not exposed. Two different estimation methods are used to determine the existence of program effects: (1) multivariate regression analysis,

and 2) propensity score matching (PSM). All analyses are weighted to account for the multi-stage sampling design.

KEY FINDINGS

LUSWETI

In Swaziland, Lusweti has focused on the production and distribution of mass communication materials based on OneLove branding. These efforts have focused on improving communication within relationships and reducing multiple concurrent partnerships as vital tools in the fight against HIV and AIDS. Key findings related to Lusweti activities and the OneLove campaign include the following:

- Exposure and Reach: Overall, 65.1% of men and 69.8% of women have been exposed to any of the Lusweti/OneLove radio programs. Specifically, 36.4% of all respondents have been exposed to one of the OneLove radio programs, and an additional 31.0% have been exposed to at least two radio programs. Exposure to television was lower; 40.8% of respondents were exposed to OneLove television programs, with females having slightly higher exposure than males (43.2% versus 38.3%). Half of respondents (50.1%) were exposed to at least one of the OneLove booklets; 17.9% of respondents reported reading one of the booklets, while 32.2% reported reading at least two booklets. Only 15.8% of respondents were not exposed to any OneLove intervention (radio, television or print), whereas 30.4% and 53.8% were exposed to the program through one or two or more media channels, respectively. Exposure to all types of media was lowest in the border regions. The OneLove *Kuncono Mynye* and *Bagcwele I quantum* radio drama had the widest reach of all of the various interventions; an estimated 323,991 people (151,752 men and 172,239 women) heard the program. Among print media, the most widely read booklet was *Love, Sex, and You*, with an estimated 180,369 readers (83,325 men and 97,044 women). An estimated 139,628 (56,082 men and 8,546 women) people watched the Love Stories film series. The most widely seen film was *Umshato* (102,889), followed by *Bloodlines* (99,040).
- Multiple partnerships: Differential effects of exposure to Lusweti/OneLove on multiple partnership outcomes are evident for males and females. Women exposed to one radio program are less likely to have had multiple partners in the last year (3.8% versus 8.4%), while women exposed to any radio or any multimedia are less likely to report currently having more than one partner (e.g. 2+ channels 1.4%, 1 channel 1.5%, no exposure 12.2%). On the other hand, among the total population, exposure to one booklet is associated with higher reports of having multiple partners in the last year (24.1% versus 13.7%), in the last month (8.1% versus 3.5%), and in the last three months (18.7% versus 7.3%). Similarly, men exposed to two or more radio shows, any booklet exposure, and two or more media channels report higher levels of multiple partnerships.
- Condom use: The effects of exposure to Lusweti/OneLove interventions differ by exposure measure and by gender. Exposure to two or more radio programs (67.0% versus 60.4%) and one booklet (69.2% versus 60.8%) are positively associated with condom use at last sex, while exposure to two or more radio programs (64.5% versus 55.5%) and one media channel (63.1%

versus 53.0%) have positive effects on condom at last sex with a regular partner among the total population. Among men, there is a dose response effect for radio exposure on condom use at last sex (2+ radio programs 73.9%, 1 radio program 71.5%, no exposure 57.6%) and on condom use at last sex with a regular partner (2+ radio programs 68.6%, 1 radio program 63.2%, no exposure 53.4%). Among men, exposure to one media channel is significantly associated with condom use at last sex with a regular partner (66.2% versus 54.8%). There are no effects of exposure to Lusweti/OneLove media on condom use among the full sample of women, though positive effects are observed for women between the ages of 15 and 24. For example, a dose-response effect is observed among this sub-sample for exposure to print media and condom use at last sex (2+ booklets 70.6%, 1 booklet 77.2%, no exposure 54.7%). A similar effect is observed among this sub-sample for condom use at last sex with regular partner attributable to exposure to OneLove print media (1 booklet, 81.5% versus 55.8%).

- HIV communication: Individuals exposed to one booklet (men, 94.3% versus 90.4%) and one media channel (total 94.5% versus 89.6%; men, 93.5% versus 89.0%) are more likely to say that one's sex life improves with communication. Further, exposure to one radio program has a positive effect on the likelihood of discussing sexual dissatisfaction with a partner among the total population (81.7% versus 72.0%) and among women (72.7% versus 60.0%).
- HIV testing: Nearly all program exposure indicators have measurable positive effects, which differ across gender, on either ever being tested for HIV or being tested for HIV in the last 12 months. For example, exposure to 2 or more radio programs is significantly associated with testing in the last 12 months for the total population, while exposure to television is significantly associated with both ever being tested and being tested in the last 12 months for both the total population and for men (e.g., men, 49.8% versus 34.2%). Exposure to two or more booklets is also significant for both outcomes for the total population and among men (e.g. total population, ever tested, 60.0% versus 46.4%). Similar results are apparent for multichannel exposure for all populations, including women. For example, women exposed to one multimedia channel are more likely to have ever been tested for HIV (83.7% versus 73.0%) , while women exposed to two or more channels are more likely to have been tested for HIV in the last 12 months (62.9% versus 45.6%).
- HIV treatment and stigma: Among the full sample, willingness to care for a person on ART is significantly associated with exposure to both levels of radio (2+ radio programs 91.9%, 1 radio program 92.9%, no exposure 86.3%) and multimedia (2+ channels 90.8%, 1 channel 92.3%, no exposure 85.1%). Respondents exposed to one booklet have higher levels of knowledge about ARVs and PMTCT. The results examining programmatic effects on stigma indicators, however, are mixed. For example, disagreement with the statement that only promiscuous people get HIV varies by exposure to two or more radio programs (83.5% versus 76.5%), to television (83.7% versus 75.3%), and to two or more media channels (80.5% versus 75.3%). Similarly, individuals exposed to multiple forms of media (e.g., 1 radio program, two or more booklets, two or more media channels) are more likely to agree that people in their community join together to help people with HIV. However, for some exposure measures, exposed individuals are more likely to

agree that people in their community would want to keep secret if a family member was HIV positive (e.g. television, 78.8% versus 70.0%).

- Transactional sex: There appear to be limited effects of exposure to program media on outcomes related to the exchange of gifts or money for sex, although attitudes towards such exchanges are less favorable among men exposed to the program. For example, among women, exposure to one booklet (49.8% versus 33.8%) and one media channel (41.4% versus 28.8%) is associated with higher reports of receiving gifts in exchange for sex with their last partner. On the other hand, a higher percentage of men exposed to television (80.4% versus 68.7%), two or more booklets (77.0% versus 69.5%), or any multimedia channels (2+ channels 77.9%, 1 channel 74.0%, versus 60.0% unexposed) disagree with the statement *men have the right to get sex for gifts*. No statistically significant associations are noted for these outcomes among the female sample.
- Forced sex and physical violence: Only 2.9% of the total population – and 4.3% of all women - report having experienced forced sex in the last 12 months. Rates of experiencing physical violence are slightly higher - 6.1% for the full sample, 7.8% for all women, and 7.7% for women aged 15-24 years. Few differences exist by levels of exposure to program media, although respondents exposed to two or more booklets are less likely to report experiencing physical violence in the last 12 months (total, 4.0% versus 8.0%; men, 2.5% versus 5.7%; women 5.8% versus 9.5%). Men exposed to two or more booklets are more likely to agree that community leaders speak out against gender-based violence (79.1% versus 62.9%), but there are no significant effects among women.

SAfAIDS

- Exposure and reach: Overall, 11.9% of respondents report any exposure to SAfAIDS interventions, most commonly via a community volunteer with a SAfAIDS badge (5.2%) or through the SAfAIDS newspaper column (3.5%). Approximately 27,712 total people - including 22,441 men and 5,271 women - have received HIV information from a SAfAIDS community-based volunteer. The most commonly read SAfAIDS materials include the SAfAIDS newspaper column (18,644 readers), GBV toolkit (4,611), and poster (4,178).
- Multiple partners: There is no evidence that exposure to SAfAIDS interventions reduces multiple partnerships although there is evidence of an effect on community norms surrounding multiple partnerships. People exposed to SAfAIDS are more likely to agree that leaders in their communities speak out against the risk of HIV with having multiple partners (76.8% versus 68.6%) and that leaders discourage people from having multiple partners (54.5% versus 42.3%), although these results appear to be limited to males.
- HIV communication: Exposure to SAfAIDS materials is positively associated with several outcomes related to HIV communication. For example, 59.1% of exposed men report discussing HIV/AIDS with their children as compared with 40.7% of unexposed men. Approximately 95.6% of people exposed to SAfAIDS materials agree that one's sex life can improve with communication with a partner, as compared with 92.3% of the unexposed.

- HIV testing: The PSM results indicate that there is a positive effect of SAfAIDS on HIV testing behaviors. For example, a higher percentage of exposed respondents – in both the full sample and among men -agree that leaders encourage HIV testing. Further, exposed respondents report a higher number of lifetime HIV tests on average, particularly among exposed women (3.7 tests versus 2.7 tests).
- HIV treatment: Men exposed to SAfAIDS interventions have higher knowledge about PMTCT and ARVs. For example, 70.8% of respondents exposed to SAfAIDS materials know that ARVs can prevent MTCT during breastfeeding as compared with 55.0% of the unexposed. However, there are no measurable effects of exposure to SAfAIDS activities on knowledge among the female sample. A higher percentage of respondents (total and men) agree that leaders encourage people who are HIV positive to get treatment.
- Forced sex and physical violence: While there are no differences between the exposed and unexposed in self-reports of experiencing forced sex or physical violence, the likelihood of reporting such violence (to family, friends or authorities) is higher – 85.3% versus 64.1% - among those exposed to SAfAIDS materials. However, there are differences across the genders regarding the activism of community leaders; 79.5% of men agree that leaders speak out against gender-based violence as compared with 69.8% of unexposed, but this is difference is not significant among women.

MARGINAL VERSUS CUMULATIVE EFFECTS

A key issue in this evaluation is distinguishing the impact of the current three-year program of partner activities from prior program activities and from the programs of other donors. This is referred to as the marginal impact of the program. Multivariate analyses were performed examining outcomes for those exposed to Lusweti activities – television or radio - only during the most recent three-year period relative to those cumulatively exposed (both prior to and during the most recent three-year period) and relative to those never exposed. The principal hypothesis is that changing behaviors, norms, and stigma require longer periods (and higher doses) of cumulative exposure than changing HIV knowledge.

Exposure to Lusweti radio and television is associated with reductions in the likelihood of having multiple partners among those cumulatively exposed in both time periods. For example, relative to those never exposed, individuals exposed to Lusweti radio both during and prior to the most recent three-year period are 6.2 percentage points less likely (12.7% versus 18.9%) to have had multiple partners in the last 12 months, while individuals exposed to Lusweti television during both periods are 7.8 percentage points less likely (7.8% versus 15.6%). Condom use is also more likely to be accepted by those with higher cumulative exposure; 79.9% of those exposed to Lusweti radio over the longer term agree that condom use in marriage is accepted relative 71.4% of those never exposed to Lusweti. No effects were detected for current exposure only. Effect sizes are even larger for cumulative exposure to Lusweti television; 84.1% of the cumulatively exposed agree that condom use in marriage is acceptable versus 76.2% of those exposed only during the most recent period and versus 69.9% of the never exposed. Testing in the past 12 months is affected only by recent exposure to Lusweti activities. For example, 52.4% of those recently exposed to Lusweti radio and 55.9% of those recently exposed to Lusweti television report having received an HIV test in the past 12 months versus 42.1% of those not

exposed to Lusweti radio or 44.6% of those not exposed to Lusweti television. There are also marginal effects on willingness to care for someone on ART (radio, 95.0% versus 85.3% unexposed; television, 95.0% versus 88.7% unexposed) and disagreeing that only promiscuous people get HIV (radio, 88.2% versus 76.8% unexposed; television, 87.2% versus 77.5% unexposed).

VALUE ADDED OF THE REGIONAL APPROACH

A key objective of this evaluation is to assess the value-added of the combined interventions of the two Regional Program partners. This objective intends to measure whether greater benefits in health impact are gained through the combination of Regional Program partner interventions, as compared with exposure to stand-alone interventions. This effect is tested in the multivariate analysis by including separate measures for exposure to Lusweti activities and for SAfAIDS activities as well as an interaction term. A significant interaction effect is indicative that combined exposure yields greater effects.

In general, there is only limited evidence of the effectiveness of the combined approach, particularly for key behavioral outcomes. Nonetheless, individuals exposed to both Lusweti and SAfAIDS activities are more likely to agree that they can resist the temptation of having sex with someone other than their main partner (97.7% exposed to both, 82.7% exposed to Lusweti only, 80.1% unexposed). They are also more likely to be worried about becoming infected with HIV (82.1% exposed to both, 50.4% exposed to Lusweti only, 41.2% unexposed). While knowledge levels are generally high overall, exposure to both programs also has a significant effect on declaring false the statement that TB cannot be cured if you are HIV+ (84.5% exposed to both, 58.1% exposed to Lusweti only, 63.5% unexposed) and disagreeing with the normative statement that telling people you are HIV positive does not help anything (80.7% exposed to both programs, 65.2% of respondents exposed to Lusweti only, and 64.7% of those not exposed to anything).

CHAPTER 1: BACKGROUND AND OBJECTIVES

1.1 BACKGROUND ON THE REGIONAL PARTNER PROGRAMS IN SWAZILAND

In 2007, the Soul City Institute for Health and Development Communication (IHDC) formed a partnership with the Southern Africa HIV and AIDS Dissemination Information Services (SAfAIDS) and the Community Media Trust (CMT) to implement the Southern Africa Regional Behavior Change Communication Program in eight countries of Sub-Saharan Africa (Malawi, Zambia, Zimbabwe, South Africa, Mozambique, Lesotho, Namibia and Swaziland). This program, funded by the British Department for International Development (DfID), seeks to reduce HIV infection and related morbidity by enabling individuals and their communities to address the determinants of behavior, to promote individual behavior change, and to improve access to essential health commodities and services. A regional approach was developed to ensure consistent, coherent messaging given high inter-regional mobility. The focus of this report is on the activities of the partners that are active in Swaziland: Lusweti/Soul City and SAfAIDS.

The program aims to increase health awareness and facilitate social and behavior change through the use of mass media, community and social mobilization, and face-to-face interactions surrounding priority themes and messaging. Various program activities were developed to strengthen community and organizational capacity in the areas of sexual and reproductive health, HIV prevention, gender-based violence, and HIV treatment literacy. As a whole, the regional program has multiple target groups: community-based organizations (CBOs), nongovernmental organizations (NGOs), social institutions, the general population, and specific vulnerable populations (including mobile populations, communities near border posts and along transport corridors, people living with HIV, hard to reach communities and young women).

In Swaziland, Lusweti seeks to build local capacity for effective health communication, to adapt South African Soul City media for use in the local Swazi context, and to expand a regional network across Southern Africa for sharing best practices. Multiple forms of health education are used to encourage people to engage in healthy behaviors and to make lifestyle changes that help them avoid risky situations (Lusweti, 2009, 2012; Soul City, 2012). In partnership with the Soul City Institute for Health and Development Communication, Lusweti uses television, radio, newspapers, and pamphlets to disseminate information on topics related to maternal and child health, HIV prevention and treatment, and gender-based violence.

Lusweti has developed numerous mass media products, including several print materials that have been distributed nationwide in both English and siSwati. These materials include the following booklets:

- "How We Live and Love: Men and Women in Swaziland," which explains how one can simultaneously maintain acceptable cultural practices and have a positive relationship with one's partner;
- "HIV and AIDS… Action Now," which provides information on HIV testing, discussion of HIV with family members and children, coping with stigma, and living positively with HIV/AIDS. Distribution of this booklet started in 2005;
- "ARVs and Your Life," which discusses topics such as testing, coping with results, ARVs, and treatment adherence;
- "Alcohol and You," first distributed in 2007, and which discusses the risks of alcohol abuse and encourages people to drink in a sensible manner.

Lusweti booklets typically have a circulation of 400,000 copies. They are distributed nationwide through a wide range of channels, including government ministries, health centers, high schools, libraries, and NGOs.

Lusweti has focused on the production and distribution of mass communication materials tied to the OneLove branding. These efforts have focused on improving communication within relationships and reducing multiple concurrent partnerships as these objectives are viewed as vital tools in the fight against HIV and AIDS. Lusweti published and disseminated a booklet entitled "Love, Sex, and You" that provides guidance for developing healthy and emotionally fulfilling sexual relations with one partner and for increasing communication between partners with the aim of eliminating the desire for other sexual partners.

In addition to these print materials, Lusweti has broadcast *Kuncono Munye*, a 45-episode radio drama series that highlights the risk of having multiple concurrent partnerships. The series first aired in Spring 2010. Episodes are 15 minutes long and focus on a wide range of relevant topics, including transactional and intergenerational sex, condom use, and the importance of communication between partners for achieving a fulfilling relationship.

Lusweti has broadcast a series of short films, entitled *Love Stories in a Time of HIV and AIDS* on national television. The series focuses on creating awareness around multiple concurrent partners, and encouraging individuals to take control of their lives. One of the films in the series, entitled

"Bloodlines," was produced by Lusweti. The film tells the story of a promiscuous man who is unable to save his son's life as a result of his philandering. Another film series, *Untold Stories*, is a drama series for children, teens, and adults. These nine films, one of which was produced by Lusweti, focus on creating awareness around the severity of the HIV epidemic in southern Africa. The drama "*Batjele* (Tell Them)" addresses the sexual abuse of schoolgirls and tells the story of a young Swazi girl who stands up against her community and reveals what happened to her.

The *Meet Joe* campaign focuses on the dangers of multiple concurrent partnerships and encourages individuals to make healthy sexual decisions. As part of the campaign, Lusweti distributed a mini-booklet that targets border communities and mobile populations. The booklet illustrates describes how having more than one sexual partner at a time puts a person at risk of HIV and AIDS.

Other elements of the OneLove campaign include community dialogues, school dialogues, and mobile discussions (bus ride dialogues), as well as public service announcements (PSAs) on radio and television. The latter include a PSA series entitled *Champion for an HIV-free Generation.* The series consists of radio and television PSAs with African leaders to promote HIV awareness.

Lusweti's latest *S'TRU! Aw'kaphephi!* campaign is a social marketing campaign that aims to challenge cultural practices supporting multiple concurrent partnerships. To increase awareness that prevailing attitudes and perceptions in Swaziland increase risky sexual behaviors, the campaign incorporates lines and expressions that are commonly used to rationalize having multiple concurrent partners. One of the elements of the campaign is a 38-episode radio drama entitled "*Bagcwele Iquantum: S'tru Aw'kaphephi.*" The drama is broadcast on the SBIS1 radio station and deals with various attitudes and social norms condoning multiple concurrent partnerships, such as the celebration of male promiscuity and male entitlement to sexual pleasure. The campaign also includes billboards and posters that are placed throughout the four regions of Swaziland, as well as road shows in rural areas, and print materials (including a fact sheet about the campaign, and a booklet that provides an overview of the key components of the campaign).

SAfAIDS – a regional non-profit organization headquartered in Harare - has been working in Swaziland for nearly a decade (Hall 2011, SAfAIDS 2011, 2012). Since 2003, SAfAIDS has collaborated with local partners to disseminate information about HIV/AIDS and has sponsored a newspaper column dealing with issues related to HIV/AIDS. SAfAIDS has national-level partnerships with organizations such as the Ministry of Health, the Swaziland Network of People Living with HIV and AIDS (SWANNEPHA), and The

National Emergency Response Council on HIV and AIDS (NERCHA). In addition, SAfAIDS collaborates with regional-level organizations such as the Shiselweni Reform Church, with whom they have collaborate on a literacy project that involves the training of volunteers by SAfAIDS personnel on how to inform communities about antiretroviral drugs that are available for both adults and children.

The SAfAIDS approach to behavior change communication centers on the Cascade Model for targeted HIV, TB, and gender based violence prevention and information (Hall 2011). This model uses community-based information, capacity building of national HIV trainers, and community-based volunteers to disseminate information. A key component of this approach is the use of community volunteers. National trainers provide training for community-based volunteers who in turn disseminate information through community dialogues and meetings. Pamphlets, toolkits, and training packs are used by volunteers as informational tools in face-to-face meetings with community members.

A second program titled *Changing the River's Flow* is designed to scale up health service delivery by emphasizing the linkages between HIV, gender violence and culture to create programs that target women, girls, boys, and men affected by HIV (Hall, 2011; Mojapele, 2011; SAfAIDS, 2011, 2012). A key component is the use of home-based care to address these linkages, and to involve traditional leaders. SAfAIDS uses "cultural dialogue" to engage community members and leaders to identify practices that contribute to increased gender-based violence and transmission of HIV, and to strengthen their capacity to develop community driven strategies to eliminate these cultural practices. For example, the program aims to encourage traditional leaders and men to become champions of HIV prevention. In Swaziland the program does this by encouraging men and traditional leaders to use the "lisango" as a private place where they can discuss issues of manhood that are related to HIV/AIDS and gender-based violence. The lisango is the place where elders would traditionally meet to teach young men and to educate them about what it means to be a good Swazi man (Mamba 2011; SAfAIDS 2011). By using the lisango as a forum to discuss such sensitive matters, men and traditional leaders help break the silence about these issues, which in turn makes it easier for people to discuss their personal experiences.

1.2 OBJECTIVES OF THE EVALUATION

This evaluation seeks to measure the effectiveness of Swaziland component of the Southern Africa Regional Behavior Change Communication Program in affecting change in key indicators of HIV knowledge, attitudes, and individual HIV risk behaviors. Specific objectives of the evaluation in Swaziland include the following:

- To measure program reach and outcomes (in the general population and in high risk populations;
- To assess the value-added of the combined interventions of the three partners;
- To investigate the extent to which relevant aspects of the intervention built the skills and resources of communities to respond to the HIV epidemic.

Importantly, the data collected as part of this evaluation are intended to serve as inputs into the assessment of the cost-effectiveness of the program activities of the regional partners. The cost-effectiveness analysis is described elsewhere.

The study design and protocol were approved by Scientific and Ethics Committee in Swaziland and the Tulane University Biomedical Institutional Review Board (IRB).

CHAPTER 2: METHODS

The sections below describe the methods used for the selection of the survey and the quantitative analysis of the survey data in detail.

2.1 STUDY DESIGN

As is the case for the other country evaluations of the Southern Africa Regional Behavior Change Communication Program, the evaluation of the Swaziland component of the program relies upon a post-only, cross-sectional design in which individuals who self-report exposure to program interventions are compared with individuals who do not report such exposure. The fundamental issue to be is whether differences in outcomes between these two groups can be attributed to program activities, or whether they instead reflect differences in the histories or characteristics of exposed and unexposed individuals. Ideally, randomization of individuals to treatment (exposed) and control (unexposed) groups would remove this issue by creating a counterfactual group of unexposed individuals who are statistically equivalent on average to exposed individuals in all respects except program exposure. However, such a randomized design was not feasible in this case because the intervention areas had not been randomly selected by the partners (and in the case of the national media programs, could not be randomly selected), the program interventions had already been ongoing for several years at the time of this evaluation, and program specific baseline data – from which assessments of change across time could be made - were not collected. [1]

The post-only cross sectional design has several inherent limitations that are addressed – to the extent possible - through the quantitative methods described in greater detail below.

2.2 SAMPLING

2.2.1 SAMPLE DESIGN

The survey called for a nationally representative sample of adults aged 15-49 years. The overall objective was to draw a stratified, random sample using the enumeration areas (EAs) of the 2007 Swaziland Population and Housing Census sampling frame, which is the most recent census available. The survey was designed to provide information on sexual behaviors, norms and attitudes towards

[1] In July 2007, CIETtrust conducted household and school surveys in Swaziland that potentially could have served as a baseline. However, after examining the raw data from those surveys, it was determined that they would not provide a suitable baseline for the present evaluation.

HIV/AIDS and exposure to HIV prevention messages as diffused by the implementing partners of the regional program and other organizations implementing similar prevention programs. Controlling for exposure to the latter is essential in the multivariate framework.

2.2.2 SAMPLE ALLOCATION

The target sample size for the survey is 4,158. The 2007 Swaziland census includes a total of 2,076 EAs, of which 126 were selected for inclusion in the sample. The sample was designed to provide estimates in three different domains:

- Urban EAs ("urban")
- Rural EAs ("rural")
- Border post EAs ("border ")

The border post domain was defined as follows: First, all major border posts were listed based on information from the Central Statistical Office (CSO). Using Geographic Information Systems (GIS) software, the border posts were identified on a map containing the boundaries of all census EAs. The software was then used to query all EAs that were located within a 5 kilometer radius from the border post center. The query identified EAs that fell completely within the circle, but not EAs that were only partially within the circle. All EAs identified by this query were included in the border domain. In total, 510 of the 2,076 EAs in the census were classified as being in the border post domain.

The urban domain consists of all EAs that were coded as urban in the 2007 census, but excluding any EAs that had been included in the border post domain. Similarly, the rural domain consists of all EAs that were coded as rural in the 2007 census, but excluding any EAs that were included in the border post domain. Based on the census sampling frame, 312 EAs were classified in the urban domain and 1,254 in the rural domain.

For the purpose of this evaluation, the aim was to draw a sample of 126 EAs. To ensure that the sample would include a sufficient number of EAs located in program areas, program areas were oversampled. This was achieved by subdividing the existing geographical domains into a program sub-domain and a

non-program sub-domain (producing a total of 6 sub-domains).[2] The goal was to over-sample program areas within each domain with a ratio of 2:1 (i.e., 84 program EAs and 42 non-program EAs).

To draw the sample, a subsample of 598 EAs was obtained from the Central Statistical Office, which included of 50% of all program EAs (303 EAs) and 20% of non-program EAs (295 EAs). From this subsample, 42 EAs were drawn per domain.

However, to ensure that all regions (Hhohho, Manzini, Shiswelweni, and Lubombo) were included in the sample and that a sufficient number of EAs were selected from each domain, the following constraints were imposed on the selection of the EAs:

1. Within each sub-domain, at least one EA was selected from each region that is included in the sub-domain.
2. A total of 42 EAs per domain were imposed across the program and non-program sub-domains.

The resulting distribution of the 126 EAs across the subdomains is shown in Table 1.[3]

Table 1: Number of EAs to be selected, by domain and subdomain

	Urban	Rural	Border-post
Program Area	28	28	28
Non-Program Area	14	14	14
Total	42	42	42

2.2.3 SAMPLING PROCEDURES

The survey sample was selected in three stages, with samples selected independently in each domain. In the first stage of selection, within each domain and each of Swaziland's regions, EAs were selected with a probability proportional to the size of the EA[4].

[2] Program areas were defined by asking SAfAIDS and Lusweti to identify the areas where they operate (note that Lusweti also implements mass-media campaigns that are disseminated nationwide). For the purpose of the evaluation, the program area was defined as those Tinkhundlas in which the implementing partners reportedly operate.

[3] In practice, the sampling procedures resulted in one large EA being selected twice, which resulted in a total of 125 EAs, rather than 126. Following customary practice, the target size for this particular EA was doubled.

[4] Size was defined by the number of households listed in the census sampling frame.

In the second stage, households were selected within each EA using a sampling interval calculated by dividing the estimated number of households in the EA[5] by 20, a technique used when no list of households is available within EAs (Boesten and Chalabi 2006; Brogan et al. 1994; Grais et al. 2007; Henderson and Sundaresan 1982). If a selected household had no eligible respondents, or if there was a refusal at the household level, then the household was substituted with the household next-door.

In the third stage, individual respondents were selected within the selected households. After the interviewer listed all household members, one eligible male and one female (aged 15-49) were randomly selected using Kish grids (Figure 1).

Figure 1: Kish grid

Proportion of assigned tables	Table number	If the number of adults in household is: 1	2	3	4	5	6 or more
		Select adult numbered:					
1/6	A	1	1	1	1	1	1
1/12	B1	1	1	1	1	2	2
1/12	B2	1	1	1	2	2	2
1/6	C	1	1	2	2	3	3
1/6	D	1	2	2	3	4	4
1/12	E1	1	2	3	3	3	5
1/12	E2	1	2	3	4	5	5
1/6	F	1	2	3	4	5	6

If a selected respondent was not available for interviewing, up to two call-backs were made to the household in order to complete the interview. In the event that a household contained only one eligible household member, no substitutions were made. Similarly, if a household included both an eligible male and female, but one of them refused to participate, then no substitutions were made. In the event that a small EA contained too few households to complete the targeted 34 interviews, no substitutions were made.

The sampling strategy used in this study resulted in a sample that is not self-weighting (i.e., the probability of selection for all observations is not equal). To adjust the analysis for unequal probabilities of selection, three sets of weights were calculated: EA weights, household weights, and individual weights. The weighted analyses ensure that the survey results are representative at both the domain level and at the national level.

[5] The number of households in the EA was estimated based on the number of households listed in the census sampling frame and/or observation during a walk around the EA.

2.3 FIELDWORK

Tulane contracted with the Social Impact and Policy Analysis Corporation (SIAPAC), a survey firm based in Namibia, to implement the survey data collection. SIAPAC subcontracted with NERCHA to implement the fieldwork. Data collection teams were recruited by the SIAPAC Senior Quality Control Officer and Country Manager/Survey Coordinator. Potential enumerators were selected based on the following criteria: previous experience as a survey enumerator, level of education, proficiency in English and SiSwati (with knowledge of other local languages being considered an added benefit), and gender (a gender-balanced interview team was required because all interviews were conducted by an enumerator of the same sex as the respondent).

In total, eight field teams were used, each comprised of one supervisor and four enumerators (two males and females). The field teams were supervised by two field managers, each of whom was responsible for managing four field teams. All personnel were managed by the Country Manager/Survey Coordinator.

2.3.1 FIELDWORK TRAINING

Fieldwork training was conducted at a training facility in Mbabane, February 16-22, 2012. The six day training was facilitated by the SIAPAC Senior Quality Control Officer and Country Manager/Survey Coordinator. In addition, the training was attended by a representatives from the Soul City partner organizations in Swaziland, who gave presentations outlining the key components of their programs, shared some of the materials used by their respective programs, and answered questions by the trainees. All trainees were provided with a detailed field training manual and copies of the questionnaire.

The main objective of the training was to provide the field workers with the necessary skills to successfully implement a high quality survey. As such, the training covered a broad range of topics, including:

- Purpose of the study
- Basic research methods and concepts (reliability, validity)
- Sampling strategy
- Ethical protocols and cultural sensitivity

- Detailed review of the survey instrument (questionnaire)
- Interviewing techniques, including role plays
- Techniques for quality assurance

The training format consisted of lectures, as well as extensive role-play to simulate interviews. All trainees role-played a section of the questionnaire in front of the larger group, after which the training coordinators as well as the larger group had an opportunity to provide comments, ask questions, and make suggestions for improvements. All trainees were required to role-play the entire questionnaire at least once as the mock respondent, and at least once as the interviewer.

A second but equally important objective of the training was to have the entire group of training participants conduct a detailed review of the survey instrument, focusing on identifying potential problems that could occur during implementation. This included identifying questions that were culturally sensitive or could be misinterpreted in the local context. A detailed question-by-question review, as well as feedback from the role-play, resulted in further fine-tuning of the questionnaire.

The final part of the training consisted of a half-day live pretest of the survey instrument. Two EAs outside of Mbabane that were not part of the survey sample were selected as pretest sites. Survey teams were provided with census maps of these EAs and were taken to the outskirts of the EAs. During the pretest survey teams practiced reading EA maps, selecting households using sampling intervals, conducting listing of household members and conducting the interview(s). Upon completion of the pretest, all teams reconvened and discussed problems and lessons learned from the pretest.

2.3.2 QUESTIONNAIRE DEVELOPMENT

The core survey instrument used for the study was adapted from an earlier instrument that had been developed for a similar evaluation of the Regional Program as implemented in Malawi by Invest in Knowledge (IKI). In 2011, representatives from Tulane, SIAPAC, FGI, and Soul City met in Johannesburg to review the existing Malawi questionnaire and to draft a “core” questionnaire of standardized questions that could be used for the planned Soul City evaluations in other countries, with minor adaptations. This core questionnaire went through several rounds of review by representatives from the Tulane, SIAPAC, and regional partners, and was revised based on that feedback.

The development of a Swaziland specific version of the core questionnaire started in late 2011. The Swaziland specific version went through several rounds of review by Tulane, SIAPAC, and the regional partners. The questionnaire was also reviewed by representatives from Lusweti and SAfAIDS in Swaziland. Based on this feedback, the instrument was revised accordingly. Further refinements of the instrument occurred during the interviewer training. Prior to the start of the actual fieldwork, the final version of the questionnaire was submitted to the regional partners for their review and sign-off. Upon receipt of sign-off of this final version, the questionnaire was sent for printing.

2.3.3 RESULTS OF FIELDWORK

Fieldwork started in Hhohho district to ensure that the entire fieldwork management team was present for supervision and quality control. After two days of fieldwork, a retreat with the entire fieldwork team was held to discuss and resolve any issues encountered in the field. Each group of four teams was supervised by one of the field managers. During implementation, each questionnaire was first checked by the enumerator, and then coded by the field supervisor. In addition, the responsible field manager checked randomly selected questionnaires before they were submitted for data entry.

A total of 4,025 interviews were completed, slightly below the target of 4,158. In most of the 125 EAs, the fieldworkers were able to complete the targeted number of interviews. The greatest challenge during the fieldwork was interviewer fatigue. Fieldwork in urban areas was more challenging than in rural areas. In urban areas, it was more common for respondents to refuse to answer certain questions. In addition, in urban areas it was more common for respondent not to be at home during the day. Hence, the schedule was revised so that rural EAs were visited during the day, and urban EAs during afternoons and evenings. A few EAs were particularly challenging. In the case of one EA, residents were upset because they had a bad experience with a previous survey that did HIV testing. After the supervisor explained that this was a different survey, which did not involve any HIV testing, they were given permission to proceed with the interviews. In two EAs, the target number of interviews was not reached because there were not sufficient eligible respondents, and in one urban EA the target was not reached due to refusals. Of the 4,025 interviews collected in the field, 3,954 resulted in a fully completed questionnaire, and 69 interviews were partially completed. After data quality checks, a working sample of 3,972 interviews was retained for analysis.

Table 2 compares the key characteristics of the weighted 2012 Swaziland sample with the weighted 2006-7 Swaziland Demographic and Health Survey (DHS) sample. The results show that the distribution

of the samples across type of place of residence (rural/urban) is very similar, as is the distribution by region. The most notable differences are that the 2012 sample has a slightly lower percentage of respondents from Manzini (29.3% versus 33.0% for females, and 27.4% versus 32.5% for males), and a slightly higher percentage from Lubombo (25.7% versus 19.4% for females and 26.5% versus 20.8% for males). The distribution by age-group shows that the two surveys have a fairly similar age distribution, with the exception of the youngest age-groups. The 2012 survey has a substantially lower percentage of respondents who are aged 15-19 than the DHS survey. Specifically, 18.5% of females in the 2012 survey are aged 15-19, as compared with 25.5% in the DHS survey. Similarly, 21.0% of males in the 2012 survey are aged 15-19, compared to 31.8% in the DHS. To some extent, this lower percentage of adolescents aged 15-19 in the 2012 survey is likely to reflect real demographic changes. In Swaziland, fertility levels have been declining significantly over the last two decades, which has resulted in smaller birth cohorts (Central Statistical Office [Swaziland] and Macro International Inc., 2008).

In Swaziland, the typical age at marriage is late, and the percentage of women marrying appears to have decreased over time (Central Statistical Office [Swaziland] and Macro International Inc., 2008). The results in Table 2 confirm that females in the 2012 survey are more likely to have never been married than those in the 2006-7 DHS survey (61.0% versus 49.9%). Because males tend to marry later, both surveys show that the majority of males are never married. Nevertheless, the percentage of males who are never married is higher in the 2012 survey than in the DHS survey (71.3% versus 65.8%).

Table 2: Characteristics of the 2012 SARBCCP and the 2006-7 DHS samples (weighted data)

	Women		Men	
	DHS 2006-7	SARBCCP 2012	DHS 2006-7	SARBCCP 2012
Residence				
Urban	26.7%	24.8%	28.4%	27.2%
Rural	73.3%	75.2%	71.6%	72.8%
Region				
Hhohho	26.9%	25.6%	26.5%	28.5%
Manzini	33.0%	29.3%	32.5%	27.4%
Shiselweni	20.7%	19.4%	20.3%	17.6%
Lubombo	19.4%	25.7%	20.8%	26.5%
Age Group				
15-19	25.5%	18.5%	31.8%	21.0%
20-24	21.0%	25.6%	21.3%	26.0%
25-29	14.6%	20.8%	15.0%	18.6%
30-34	12.3%	15.1%	10.4%	12.7%
35-39	10.1%	7.9%	8.8%	11.4%
40-44	8.8%	5.4%	6.5%	4.6%
45-49	7.7%	6.8%	6.2%	5.8%
Marital Status				
Never married	49.9%	61.0%	65.8%	71.3%
Married	31.9%	26.9%	23.3%	20.9%
Living together	9.5%	6.2%	6.0%	5.7%
Div/separated	3.2%	2.3%	3.5%	0.9%
Widowed	5.6%	3.7%	1.4%	1.2%

2.4 DATA ANALYSIS

A principal objective of the quantitative analysis is to develop estimates of the statistical associations between exposure to partner interventions and the norms, attitudes, and behaviors upon which the regional program has focused its efforts. In order to effectively attribute differences in outcomes between exposed and unexposed individuals to the efforts of the Regional Program (and not to other confounders), the quantitative methods must:

1. Control for observable and unobservable differences between exposed and unexposed groups;
2. Control for other behavior change communication programs which may (differentially) influence the behaviors of these two groups;
3. Control for previous program efforts.

Measures of the above sets of factors are included as statistical control variables in each of the analytic methods described below in order to identify program effects.

2.4.1 Program Exposure Measures

We focus on the following measures of exposure to program interventions:

- Exposure to OneLove radio programs - This composite variable has three levels and includes exposure to the OneLove Radio Drama (*Kuncono Munye or Bagcwele I quantum*-PE6a)[6] , exposure to the OneLove Phone-in Program (PE6b), or the Champions radio adverts (PE23-PE25). Respondents are categorized based on whether they were not exposed to either program, exposed to one program, or exposed to both programs.

- Exposure to any OneLove television program - This composite variable includes exposure to any of the Love Stories Film Series (PE12-PE12k), any of the Untold Stories Drama Series (PE14-PE14j), or the Champions (PE20- PE22) or Meet Joe (PE10) advertisements. This variable is dichotomous (Yes/No).

- Exposure to any OneLove print materials – This variable was calculated by determining whether respondents were exposed to any of the OneLove booklets (PE8a-PE8f).

[6] Note that the codes (e.g., PE6a) refer to questions in the questionnaire. They are included in the report so that interested persons can refer directly to the questionnaire or so that subsequent analysts can follow what was done during this analysis.

- Multimedia exposure to OneLove – This variable measures the number of media channels through which the respondent was exposed to One Love interventions. It includes all exposure by way of radio, television, and/or print materials described above. Three categories were created for this variable – none, 1 channel, and 2+ channels.

One variable was created for exposure to SAfAIDS.

- Exposure to any SAfAIDS materials and programs – Exposure to SAfAIDS is measured by a composite variable that includes exposure to any of the following SAfAIDS variables: exposure to any of the SAfAIDS print materials (including manuals, flipcharts, posters, brochures, booklets, factsheets and other documents-SE4SE5a-SE5h), receiving information about HIV and AIDS from a community based volunteer carrying a SAfAIDS badge (SE8), participating in a community dialogue (SE9), or participating in a *Changing the River's Flow* program (SE13). This variable is dichotomous (Yes/No).

Unadjusted (bivariate) associations between program exposure and targeted outcomes are presented in the appendices for each exposure measure and the programmatic outcomes they are intended to influence. We do not report on these bivariate associations in the text simply because these associations make no statistical controls for any of the above confounders. Absent such controls, there is a real possibility that any differences in outcomes between exposed and unexposed individuals may reflect underlying differences in those who are exposed rather than the effects of the program. This potential bias is reduced (but not eliminated) by adjusting – or controlling for – differences through matching methods or multivariate regression analysis. Regardless, because the data are cross-sectional and exposure to interventions is largely outside of the control of the researchers, assessments of causality between exposure to partner interventions and improved norms, attitudes, and behaviors are difficult to make, an issue discussed in greater detail below.

2.4.2 Multivariate Regression Analysis

We attempt to determine the statistical association between exposure to program interventions and outcomes hypothesized to be influenced by those interventions using a multivariate regression model that includes measures of self-reported exposure to those interventions and a set of statistical control variables. All regression models contain the following control variables: 1) socio-demographic variables

(including age, ethnicity, religion, marital status, etc.); 2) variables that capture access to media (English literacy, ownership of radio, radio and television listenership and viewership); 3) variables capturing relevant life experience (national/international travel and whether the respondent knows someone who is HIV positive).

An important objective of the evaluation is also to differentiate between exposure to interventions of Lusweti and SAfAIDS and exposure to other HIV/AIDS programs with similar objectives. To do this, data from the section of the questionnaire on exposure to other programs is used to construct measures of exposure to those programs. These exposure measures are divided into three types: (1) dichotomous variables that refer to specific programs such as the radio program "The Navigation"; (2) an index of exposure to generic HIV programs, such as community meetings, trainings, radio listening clubs; and (3) and index of exposure to sermons that address HIV and AIDS-related topics (such as those about supporting people who have AIDS). These variables are then included in the regression models – as well as in the propensity score models described below – to control for and to distinguish their contributions to differences in outcomes.

We estimate the relationships between our outcomes of interest and our programmatic exposure measures using a probit model for binary outcomes and linear regression for continuous outcomes. For binary outcomes, logit (logistic) models have often been favored because of their computational ease and because the interpretation of odds ratios tends to be more straightforward, while probit models have been favored (mostly be economists) when there is a strong *a priori* assumption that the underlying distribution is normal as opposed to logistic. However, in this case, the choice of a probit model is motivated by its advantages in strategies to address unobserved heterogeneity (i.e., selection bias) discussed below. Regardless, for most practical purposes and applications, results with logit and probit models are nearly indistinguishable (Greene 2002).

To calculate adjusted effects and adjusted proportions (akin to the treatment effects in the PSM models), the Stata command *margins* was employed, which calculates the marginal effect – the incremental change in the probability of an outcome due to an incremental change in an explanatory variable – for each explanatory variable, most notably the variables related to exposure to the programs. The *margins* command also permits calculations of the predicted probability of an outcome occurring as a function of exposure to program interventions.

2.4.3 Propensity Score Matching

An alternative method of estimating program effects is to match people based on the likelihood of exposure to program interventions, i.e., the propensity score, and then to compare mean outcomes for individuals with equal likelihoods of exposure. We calculate the propensity score in Stata using the *pscore* command, which estimates a probit model for each binary exposure measure. For exposure measures reflecting intensity of exposure (e.g., "no exposure," "1 Radio Show," "2 Radio Shows"), propensity scores are calculated for pairwise comparisons between the exposure category and the null ("no exposure") category.

Variables that are hypothesized to be associated with exposure are included as independent variables in the propensity score equation, including: 1) socio-demographic variables (age, education, wealth, religion, marital status, etc.); 2) variables that capture access to media (English, literacy, ownership of radio, radio and television listenership and viewership); 3) variables capturing relevant life experience (national/international travel and whether the respondent knows someone who died of AIDS).[7]

We restrict our analysis to the area of common support (or overlap) of the propensity score for exposed and unexposed individuals. For the majority of exposure variables, over 95% of exposed respondents were able to be matched to a suitably similar non-exposed respondent based on the propensity score. To ensure sufficient comparability between matched exposed and unexposed individuals, we also test for covariate balance within blocks (or strata) of the propensity score.

We estimate the average treatment on the treated (ATT) effect using kernel matching based on a weighted average of all controls, where the weights are inversely proportional to the distance between

[7] All propensity scores included a basic set of respondent characteristics, including: age (continuous years), gender (female), domain of residence (urban and border), years of schooling, religion (Christian, LEC, other religion, marital status (never married), English literacy, schooling (secondary, university), wealth quintile, whether or not anyone in the respondent's household has salaried employment, and whether or not the respondent knew someone who had died of AIDS In addition, propensity scores were derived including variables that were hypothesized to affect exposure to communication activities but not outcomes. These included: ownership of a radio, ownership of a television, a binary variable for whether or not a respondent had traveled outside of their home region but within Swaziland for at least two weeks in the past year, whether or not a respondent had traveled outside of Swaziland in the last two years, the number of days per week that the respondent listens to the radio, the number of days per week that a respondent watches television, the number of days per week that a person reads the newspaper, an index of exposure to other HIV/AIDS behavior change communication activities and an index of exposure to sermons on HIV/AIDS related topics (about the risks of having more than one partner, about supporting people with AIDS, about fighting stigma and discrimination, and advising people to use condoms). To achieve balance in the propensity score across blocks, interactions were selectively added to the propensity score estimations as necessary.

the propensity score of treated and controls (Becker and Ichino 2002). The ATT is calculated using the Stata command *psmatch2* (Leuven and Sianesi 2003), which generates predictions of the *levels of an outcome* for exposed ("treatment") and unexposed ("control") individuals, as well as the treatment effect, reflecting the estimated difference in average outcomes between exposed and unexposed individuals.

The results of the matching estimations are shown in the appendices. In the summary tables in the main text of the report, columns are added to alert the reader to whether or not the multivariate regression results are confirmed in statistical significance by the PSM estimates.

2.4.4 Simultaneous Equations Modeling

A key limitation of both of the multivariate estimation methods described above is that they control only for observed confounders, i.e. information collected directly from respondents via the survey questionnaire (Rosenbaum and Rubin 1983; Rosenbaum 1991; Lu, Zanutto et al. 2001; Rosenbaum 2009; Silber, Lorch et al. 2009). Unobserved factors, may also affect estimates of the relationship between program interventions and outcomes. As noted in other studies (Guilkey, Hutchinson et al. 2006; Hutchinson and Wheeler 2006), exposed individuals likely differ from unexposed individuals in very measurable (exogenous) ways, such as levels of education, income, age, or geographic location. But they may also differ in other less easily measured ways – they may be more media savvy, be more efficient producers of health from available health inputs, or possess some other characteristics that are potentially correlated with both exposure and health outcomes. Failure to control for both observed and unobserved differences can lead to confounding and potentially biased estimates of intervention effects.

Under certain conditions, SEM can account for the simultaneous determination of exposure and outcomes due to unobserved covariates (Bollen and Long 1992; Bollen 2002; Kincaid and Parker 2008; Bollen and Davis 2009; Kirby and Bollen 2009). In this analysis, we rely upon bivariate and trivariate probit models containing one or two endogenous exposure measures. For each such model, a main outcome equation is specified as a function of a single exposure measure (e.g., self-reported exposure to any OneLove radio program) or dose-response exposure measured (e.g., one OneLove multimedia channel versus none; two or more OneLove multimedia channels versus none). We estimate our models in Stata using the *cmp* command for multi-equation, multi-level, conditional recursive mixed-process estimators (Roodman 2011).

Key explanatory variables for the SEM models include not only the socio-demographic variables described above but also variables hypothesized to uniquely affect exposure but not the outcomes under study. These variables – known as the excluded exogenous variables (or exclusion restrictions) - overlap with those that determined exposure in the calculation of the propensity score and include variables associated with access to media (primary language, literacy, ownership of radio, radio and television listenership and viewership).

A key component of the analysis is in determining the validity of the exclusion restrictions, both theoretically and technically. Several key statistical conditions are necessary for the exclusion restrictions to be valid (i.e., for model identification to be achieved) (Wooldridge 2009):

Condition 1. The excluded exogenous variables must be statistically significant explanatory factors determining exposure;
Condition 2. The excluded exogenous variables must not be statistically significant explanatory factors determining outcomes;
Condition 3. There must be at least as many excluded exogenous variables as exposure variables included in the model.

To assess whether these conditions are met, probit regressions were run in the first stage (as described above) and F tests calculated to identify those variables that would allow for the rejection of the null hypothesis that the exclusion restrictions were not jointly statistically significant different from zero (Condition 1). Different combinations of exclusion variables (e.g., number of days per week that respondent listened to the radio, number of days per week that a respondent read a newspaper) were included until the null hypothesis could be rejected. Once these variables were determined, they were included in the outcome equation and the joint F test was again calculated to demonstrate that these variables were not jointly significant determinants of the outcomes (Condition 2). Frequently, one or several of these variables were individually significant, leading to the rejection of the null hypothesis, and the need to re-visit stage 1. This process was repeated for every program outcome and exposure variable until both conditions were met. In practice, it proved difficult for both conditions to be met. Often TV viewership, for example, was a significant determinant of both the exposure variable and the outcome under study, thereby rendering it unsuitable as an exclusion restriction.

2.4.5 Other Issues

For all of the quantitative analyses, the Stata 12.0 statistical software package is used. To address the multistage sample design described previously, Stata's *svy* routines are utilized, since these account for the differential probabilities of selection of EAs, households within EAs and respondents within

households. The *svy* commands also address the sample stratification and the intracluster correlation associated with the multistage sample design and greater homogeneity of households within EAs relative to simple random sampling.[8] Details of Stata's procedures for complex survey designs are available here (Stata Corp. 2011).

[8] Recall that two respondents, a male and a female, were selected from each sampled household. The characteristics of such individuals tend to "cluster." That is, two respondents from the same household are likely to be more similar to each other than two respondents selected randomly from different households: they have the same household assets, they are likely to have similar levels of literacy and to be of similar ages, etc.

CHAPTER 3: SAMPLE DESCRIPTION AND LOGFRAME INDICATORS

A summary description of the sample is found in Table 3. More detailed information can be found in Appendix B. Results are presented for the total sample, for men and women, and for specific populations of interest to the program: women between the ages of 15 and 24, urban/rural, and border populations.

Table 3: Sample description

	National N= 3,972	Males N=1,976	Females N=1,996	Females 15-24 N=777	Rural N=1,339	Urban N=1,301	Border N=1,332
Age Categories							
15-24	19.7%	21.0%	18.5%	41.9%	20.0%	16.7%	21.6%
20-24	25.8%	26.0%	25.6%	58.1%	25.9%	24.6%	26.5%
25-29	19.7%	18.6%	20.8%		19.5%	22.6%	17.8%
30-34	13.9%	12.6%	15.1%		14.5%	15.6%	10.8%
35-39	9.6%	11.4%	7.9%		9.4%	11.2%	8.6%
40-44	5.0%	4.6%	5.4%		4.3%	5.8%	6.1%
45-49	6.3%	5.8%	6.8%		6.4%	3.5%	8.5%
Current Marital Status							
Married/union	30.0%	26.6%	33.1%	12.5%	30.0%	29.4%	30.6%
Div/sep/widow	4.1%	2.1%	5.9%	0.2%	3.9%	4.1%	4.5%
Never married	65.9%	71.3%	60.9%	87.2%	66.1%	66.6%	64.9%
Religion							
Charismatic	17.5%	11.1%	23.5%	24.9%	16.2%	23.2%	16.0%
Protestant	6.3%	6.9%	5.8%	5.8%	6.5%	8.1%	4.4%
Roman Catholic	5.2%	5.6%	4.8%	3.8%	4.1%	10.4%	3.6%
Pentecostal	6.9%	8.9%	5.0%	5.2%	7.1%	7.6%	5.8%
Zionist	30.1%	31.7%	28.6%	26.3%	30.9%	22.8%	34.4%
Apostolic sect	5.2%	5.4%	5.1%	5.5%	4.8%	7.5%	4.4%
Islamic	18.0%	12.8%	22.8%	25.0%	17.8%	11.4%	24.0%
Other	10.7%	17.5%	4.3%	3.6%	12.6%	9.0%	7.3%
Highest Level of School Attended							
None	5.4%	4.5%	6.2%	1.5%	6.1%	2.4%	6.2%
Primary	19.3%	19.0%	19.6%	14.0%	19.8%	14.0%	22.6%
Secondary	29.4%	27.2%	31.4%	34.3%	32.4%	21.0%	29.2%
High school	36.8%	41.0%	32.9%	43.9%	36.1%	41.2%	34.7%
Tertiary	9.1%	8.3%	9.8%	6.4%	5.6%	21.4%	7.2%
Able to Read English	64.4%	63.6%	65.3%	77.8%	60.3%	78.5%	62.6%
Wealth Index (Quintiles)							
First quintile	18.3%	17.2%	19.4%	19.2%	18.9%	6.3%	27.1%
Second	21.5%	21.1%	21.8%	23.2%	25.6%	8.8%	22.1%
Third	23.5%	25.8%	21.4%	22.6%	25.9%	18.5%	21.9%
Fourth	23.8%	22.8%	24.7%	22.8%	25.6%	25.3%	18.1%
Fifth quintile	12.9%	13.0%	12.7%	12.2%	4.0%	41.1%	10.8%
Ownership of Radio and Television							
Household owns television	55.0%	55.6%	54.5%	53.7%	52.1%	71.5%	48.1%
Household owns radio	83.7%	86.3%	81.4%	79.1%	83.9%	86.5%	81.0%

The age distribution of men and women in the sample is similar and follows a standard population pyramid structure. Respondents between the ages of 15 and 24 years make up 45.5% of the sample, while respondents between the ages of 40 and 49 years constitute only 9.3% of the sample. Over three-quarters of respondents have attended any secondary school or higher[9], and 30% report being married or in a union. A higher percentage of women (33.1%) report being married than men (26.6%). In terms of self-reported religious affiliation, 30.1% are Zionist , followed by 18.1% Islamic, and 17.1% Charismatic. Around 64% of the sample can read English but there are some rural and urban differences; 78.5% of urban respondents can read English as compared with 60.3% of rural respondents.

Approximately 83.7% and 55.0% of the respondents in the national sample live in a household that owns a radio and a television, respectively. This result is consistent across the different sub-populations, though ownership of both radios and televisions is higher in urban areas. The lowest percentage of ownership of these two assets is in the border areas with the biggest difference observed in television ownership. While television ownership is 71.5% if urban areas, only 48.1% of border respondents report owning a television.

Two key vulnerable populations are included in the evaluation of the Regional program: young women aged 15-24 years and border populations. As can be seen in the table above, the sample sizes for these populations are 777 and 1,332, respectively. The analysis for vulnerable populations uses the same set of exposure measures and outcomes as used for the general population, where sample sizes permitted.[10]

Estimates of the DfID Logframe indicators for Swaziland are presented below. Descriptive statistics for the complete set of indicators are provided in Appendix E.

The DfID Logframe calls for measurement of progress toward "Increased health awareness and related social and behavioral change," which is measured by the following indicators:

- *Safer sexual practices*: Percentage of male and female adults aged 17 years or older who had more than one sexual partner in the past year;

[9] The questionnaire asked for highest level of school attended so these numbers do not indicate percentage who completed.

[10] The minimum sample size for regressions was set using a formula proposed by Green (1991) of N=104+p, where p are the predictor variables. For the present analysis N=136.

- *Safer sexual practices*: Percentage of men and women who reported use of a condom in last sexual intercourse, among those who had more than one partner in the past 12 months;
- *Stigmatizing attitudes*: Percentage of adults aged 17 years or older who do not think that HIV/AIDS is a punishment for sinning;
- *Correct knowledge of HIV management*: Percentage of adults aged 17 and older who know that people can transmit HIV while on ARVs.

The targets for these indicators, as well as estimates for a baseline[11] and the current survey are provided in the Table 4.

Table 4: Logframe indicators-Swaziland

Indicator		Target	Baseline	2011
Percentage of adults (17 and older) who had more than one sexual partner in the past year	Total	9%	13%	17%
	Males	-		30%
	Females	-		6%
Percentage who used a condom in last sex, among those who had multiple partners in the past 12 months	Males	46%	56%	74%
	Females	24%	57%	81%
Percentage of adults (17 and older) who do not think HIV/AIDS is a punishment for sinning	Total	90%	69%	81%
	Males	-		82%
	Females	-		81%
Percentage of adults (17 and older) who know that people can transmit HIV while on ARVs	Total	80%	76%	91%
	Males	-		93%
	Females	-		89%

Since the baseline survey, there has been an increase in the percentage of adults who had more than one sexual partner in the past year. Approximately 17% of respondents report having multiple partners in the past year as compared with 13% who reported having multiple partners at baseline. However, men are many times more likely to report multiple partners than women – 30% versus 6% respectively. Condom use at last sex (among those with multiple partners) increased by 18 percentage points for males (from 56% to 74%) and by an even larger amount for females (from 57% to 81%), exceeding targets for both genders. There has been an increase in the percentage of people who do not think HIV/AIDS is a punishment for sinning from 69% at baseline to 81% in 2012. There are no gender

[11] Baseline numbers come from a presentation given by Ailie Clarkson, Statistics Adviser, DFID 28th April 2010 *DFID Southern Africa BCC Programme: Impact*

differences for this indicator. The 2012 value falls short of the target of 90% but progress towards the target is evident. Finally, there is an increase - from 76% to 91% - in the percentage of adults who know that HIV positive people can transmit HIV while on ARVs. A higher percentage of men know this but the target of 80% is met by both men and women.

CHAPTER 4: LUSWETI/ONELOVE

4.1 EXPOSURE MEASURES

As was presented above, exposure to Lusweti activities and the OneLove campaign is analyzed using the following key indicators:

- Exposure to OneLove radio programs - This composite variable has three levels and includes exposure to the OneLove Radio Drama (*Kuncono Munye or Bagcwele I quantum*-PE6a)[12] , exposure to the OneLove Phone-in Program (PE6b), or the Champions radio adverts (PE23-PE25). Respondents are categorized based on whether they were not exposed to either program, exposed to one program, or exposed to both programs.

- Exposure to any OneLove television program - This composite variable includes exposure to any of the Love Stories Film Series (PE12-PE12k), any of the Untold Stories Drama Series (PE14-PE14j), or the Champions (PE20- PE22) or Meet Joe (PE10) advertisements. This variable is dichotomous (Yes/No).

- Exposure to any OneLove print materials – This variable was calculated by determining whether respondents were exposed to any of the OneLove booklets (PE8a-PE8f).

- Multimedia exposure to OneLove – This variable measures the number of media channels through which the respondent was exposed to One Love interventions. It includes all exposure by way of radio, television, and/or print materials described above. Three categories were created for this variable – none, 1 channel, and 2+ channels.

Estimates of exposure to program activities can be found in Figure 2 and in Table 5. Overall, 65.1% of men and 69.8% of women have been exposed to any radio programs. Specifically, 36.4% of all respondents have been exposed to one of the OneLove radio programs, and an additional 31.0% were exposed to at least two radio programs. Females are slightly more likely than males to have been exposed to two or more OneLove radio programs (33.9% versus 27.9%). Respondents in border regions are less likely than those in either rural or urban areas to have been exposed to two or more OneLove radio programs (25.3% for border areas, 32.9% for rural areas, and 32.2% for urban areas).

[12] Note that the codes (e.g., PE6a) refer to questions in the questionnaire. They are included in the report so that interested persons can refer directly to the questionnaire or so that subsequent analysts can follow what was done during this analysis.

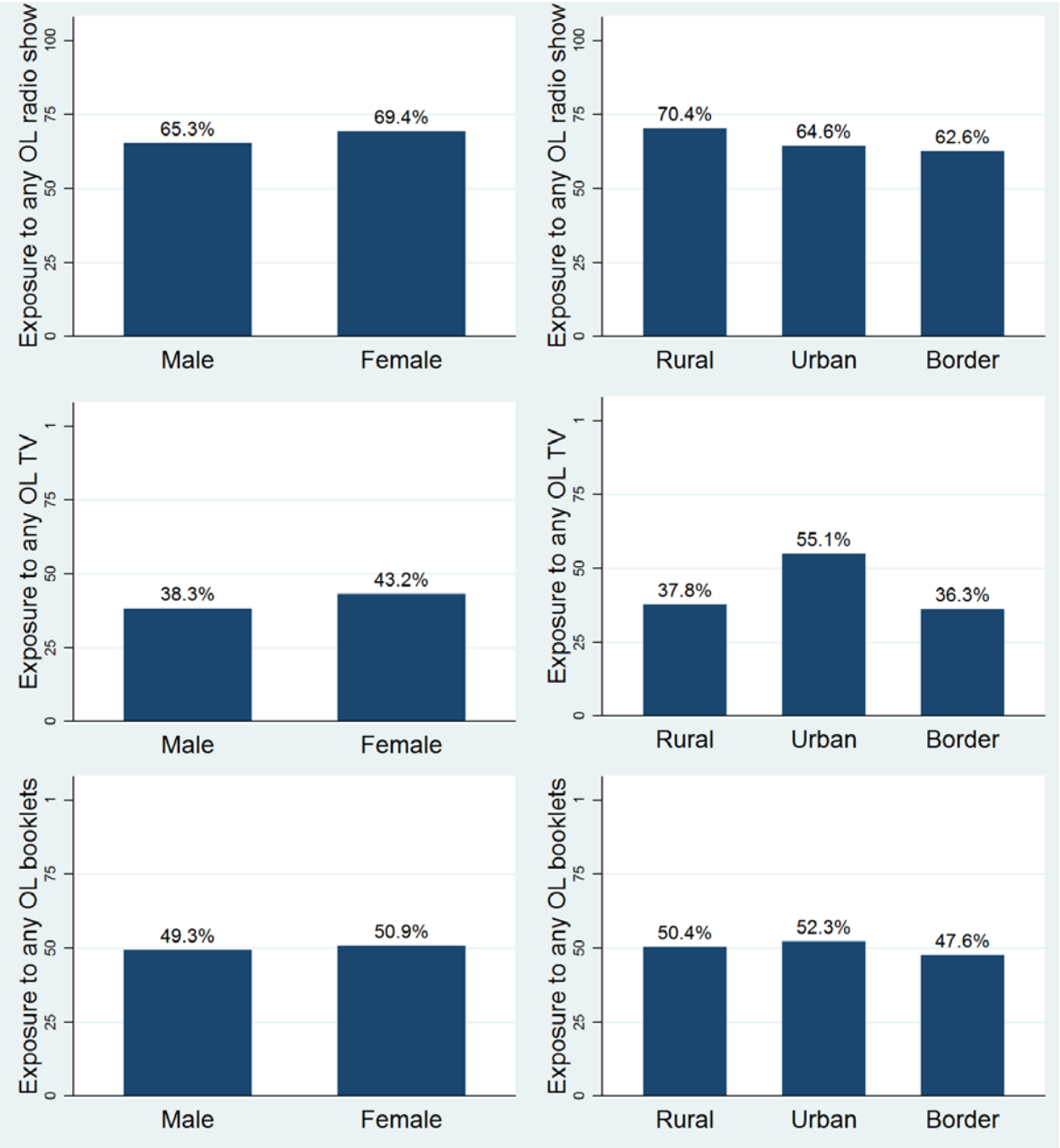
Overall, 40.8% of respondents were exposed to one or more OneLove television programs, with females having slightly higher exposure than males (43.2% versus 38.3%). As anticipated, exposure to OneLove television programs is much higher in urban areas (55.1%) than in either rural or border areas (37.8% and 36.3%, respectively).

Regarding the specific components of the OneLove television programs, 25.4% of respondents reported exposure to any of the Untold Stories drama series, and 26.3% reported exposure to any of the *Love Stories in the Time of HIV* films. Only 3.8% reported seeing the Meet Joe television advertisement, while recall of the Champions television advertisements ranged from 6.7% for the Speciosa Wandira advertisement to 16.8% for the Desmond Tutu advertisement.

Half of respondents (50.1%) were exposed to at least one of the OneLove booklets. Overall, 17.9% reported reading one of the booklets, while 32.2% reported reading at least two of the booklets. Exposure to OneLove booklets does not appear to vary by gender but readership is slightly lower in border areas. The highest exposure was to the booklet Love, Sex, and You (33.8%) followed by How We Live and Love (29.3%) and *Indlela lesiphila ngayo* (23.9%).

Examination of exposure to OneLove through different media channels (radio, television, or print) indicates that 15.8% were not exposed to any OneLove intervention, whereas 30.4% and 53.8% were exposed to the program through one and two or more media channels, respectively. Women were slightly more likely than men to report exposure to two or more media channels (55.9%% versus 51.6%). Respondents residing in border areas were less likely to be exposed to more than one media channel (48.3%) as compared with those residing in rural and urban areas (54.7%% and 57.8%. respectively).

Figure 2: Exposure to OneLove, by gender and domain



Among young women aged 15-24 years, who are one of the key target groups, 66.0% reported exposure to a OneLove radio show (with 36.1% reporting exposure to one radio show, and 30.0% exposure to at least two radio shows), and 38.7% reported exposure to OneLove television. Nearly half of all young women aged 15-24 reported having read at least one of the OneLove booklets (46.7%). Of these, 17.3% read one booklet, and 29.5% read two or more OneLove booklets. Results for multimedia exposure show that 31.8% of young women were exposed to OneLove through a single media channel, while 50.7% were exposed through two or more media channels.

Over two out of three of the respondents reported having seen the OneLove logo (67.1%), with greater recognition by women relative to men (73.1% versus 60.5%), and in urban areas (73.5%)as compared with rural and border areas (65.4% in rural areas and 65.6% in border areas). Spontaneous recall of the OneLove slogan was 20.7%, while an additional 46.6% recognized the slogan when prompted.

Exposure to the *Meet Joe* campaign was modest. Only 3.8% of respondents reported seeing the Meet Joe TV advertisement, and 5.5% reporting seeing the *You Haven't Met Joe* booklet. However, 30.2% reported hearing the *S'THRU! Aw' khaphephi!* Talk show and 18.5% reported reading the *S'THRU! Aw' khaphephi!* booklet. Only 2.3% of respondents had participated in a community dialogue. Finally, exposure to the Champions television adverts ranged from 6.7% to 16.8%, while exposure to the Champions radio adverts ranged from 1.6% to 3.8%.

Table 5: Exposure to Lusweti/OneLove by gender and domain

	Men N=1976	Women N=1996	Women 15-24 N=777	Border N=1332	Urban N=1301	Rural N=1339	Total N=3972
Composite Exposure Measures							
Exposure to No Radio Shows	34.7%	30.6%	27.8%	37.4%	35.4%	29.6%	32.6%
Exposure to One Radio Show	27.4%	35.5%	37.7%	37.3%	32.4%	37.5%	36.4%
Exposure to Two Radio Shows	27.9%	33.9%	34.5%	25.3%	32.2%	32.9%	31.0%
Exposure to Any Television	38.3%	43.2%	48.0%	36.3%	55.1%	37.8%	40.8%
Exposure to No Booklets	50.7%	49.1%	38.5%	52.4%	47.7%	49.6%	49.9%
Exposure to One Booklet	17.6%	18.2%	20.2%	16.5%	17.8%	18.5%	17.9%
Exposure to Two or More Booklets	31.7%	32.7%	41.3%	31.1%	34.5%	31.8%	32.2%
Exposure to No Media Channels	18.3%	13.4%	9.8%	19.0%	15.1%	14.7%	15.8%
Exposure to One Media Channel	30.1%	30.7%	25.7%	32.7%	27.2%	30.6%	30.4%
Exposure to Two or More Media Channels	51.6%	55.9%	64.4%	48.3%	57.8%	54.7%	53.8%
Individual Exposure Measures							
OneLove Slogan: Spontaneous	15.0%	26.0%	33.5%	19.7%	23.8%	19.9%	20.7%
OneLove Slogan: Heard or Seen	50.6%	42.9%	39.9%	45.8%	46.7%	47.0%	46.6%
Ever Heard of OneLove	86.1%	89.2%	94.1%	86.9%	90.5%	87.0%	87.7%
Seen OneLove Logo	60.5%	73.1%	77.4%	65.6%	73.5%	65.4%	67.1%
Radio: Kuncono Munye or Bagcwele I Quantum Radio Drama	59.2%	62.6%	63.7%	57.3%	57.3%	63.7%	60.9%
Radio: S'THRU Aw'kaphephi talk show	26.3%	33.8%	35.1%	24.5%	30.0%	32.6%	30.2%
Radio: OneLove Talk Show	18.2%	18.5%	17.9%	16.5%	21.2%	18.1%	18.4%
Read: Love, Sex, and You	32.5%	35.1%	42.4%	31.3%	40.9%	32.4%	33.8%
Read: How We Live and Love	28.3%	30.3%	39.3%	27.1%	30.5%	29.8%	29.3%
Read: You Havent Met Joe	6.2%	4.9%	4.7%	4.5%	7.5%	5.3%	5.5%
Read: S'THRU! Aw' kaphephi	18.7%	18.3%	23.4%	17.8%	17.3%	19.2%	18.5%
Read: Indlela lesiphila ngayo	23.0%	24.7%	28.7%	23.4%	22.6%	24.5%	23.9%
Watched: Love Stories film series	21.8%	30.2%	35.5%	20.5%	39.3%	23.9%	26.2%

	Men N=1976	Women N=1996	Women 15-24 N=777	Border N=1332	Urban N=1301	Rural N=1339	Total N=3972
Watched film: When the Music Stops	6.5%	9.8%	12.1%	4.7%	13.7%	7.7%	8.2%
Watched film: Big House, Small House	6.1%	7.6%	9.4%	5.4%	13.7%	5.1%	6.9%
Watched film: Travelling Man	9.8%	10.3%	9.0%	7.7%	15.6%	9.2%	10.1%
Watched film: After the Honeymoon	8.7%	9.3%	11.6%	6.3%	12.8%	8.8%	9.0%
Watched film: Chaguo	4.1%	4.7%	5.1%	3.4%	8.7%	3.4%	4.4%
Watched film: Umshato	15.6%	22.8%	26.0%	15.4%	28.7%	17.6%	19.3%
Watched film: Bloodlines	11.4%	25.3%	28.7%	14.3%	28.1%	17.0%	18.6%
Watched film: Second Chances	6.9%	9.7%	11.1%	6.1%	12.7%	7.7%	8.3%
Watched film: Against the Odds	4.5%	6.3%	8.0%	4.9%	7.7%	4.9%	5.5%
Watched film: Betrayed	4.7%	9.6%	11.3%	6.5%	11.0%	6.2%	7.2%
Watched drama: Untold Stories Series	21.9%	28.8%	31.3%	20.8%	41.3%	21.8%	25.4%
Watched drama: Rebel Rhymes	5.5%	6.4%	5.1%	3.7%	9.4%	5.6%	5.9%
Watched drama: Mapule's Choice	6.8%	9.7%	8.1%	6.6%	13.3%	7.2%	8.3%
Watched drama: Secrets and Lies	9.3%	15.4%	13.7%	9.8%	22.4%	10.1%	12.5%
Watched drama: The Test	3.6%	6.3%	7.0%	5.0%	9.8%	3.4%	5.0%
Watched drama: Tempestade	2.3%	6.0%	5.0%	4.1%	8.5%	2.8%	4.2%
Watched drama: Ulendo waRose	2.7%	6.3%	5.3%	4.0%	7.2%	3.8%	4.5%
Watched drama: Batjele	10.9%	22.9%	25.5%	14.4%	26.9%	14.8%	17.1%
Watched drama: Chipo's Promise	2.9%	8.0%	8.3%	4.1%	8.2%	5.2%	5.6%
Watched drama: Between Friends	6.1%	9.6%	8.1%	5.8%	13.4%	6.9%	7.9%
Saw: Meet Joe Television Advert	3.9%	3.7%	5.1%	2.8%	5.0%	3.8%	3.8%
Heard: Champions Advert, Dr. Speciosa Wandira	1.9%	1.3%	1.8%	1.0%	3.6%	1.1%	1.6%
Heard: Champions Advert, Dr. Kenneth Kaunda	2.6%	1.5%	1.8%	1.3%	4.3%	1.6%	2.1%
Heard: Champions Advert, Bishop Desmond Tutu	5.7%	2.1%	2.8%	2.9%	5.6%	3.6%	3.8%
Saw: Champions Advert, Dr. Speciosa Wandira	9.0%	4.7%	5.2%	5.2%	11.4%	5.7%	6.7%
Saw: Champions Advert, Dr. Kenneth Kaunda	13.2%	6.1%	6.0%	9.1%	15.2%	7.7%	9.5%
Saw: Champions Advert, Bishop Desmond Tutu	21.8%	12.2%	12.8%	17.0%	24.7%	14.0%	16.8%
Participated in OneLove community dialogue	3.9%	0.8%	0.8%	1.0%	3.1%	2.5%	2.3%
Ever Heard: Lusweti	85.9%	88.7%	90.3%	84.3%	88.8%	88.1%	87.4%
Knows: Lusweti Logo	74.3%	86.7%	89.0%	76.0%	84.5%	81.3%	80.7%
Read: Alcohol and You	41.4%	45.2%	57.7%	36.5%	48.2%	44.5%	43.4%
Read: HIV and AIDS...Action Now!	25.8%	33.6%	42.7%	28.5%	31.3%	29.9%	29.9%
Read: ARVs and Your Life	27.2%	31.3%	40.7%	24.7%	30.1%	31.0%	29.4%
Read: Tjwala Nemphilo Yakho	35.0%	37.4%	46.1%	30.2%	33.7%	39.6%	36.3%
Read: Ema ARVs Nemphilo Yakho	20.1%	31.2%	36.9%	21.0%	20.1%	29.8%	25.9%
Heard Lusweti Radio Drama	59.2%	60.8%	62.3%	58.1%	57.7%	61.6%	60.0%

	Men N=1976	Women N=1996	Women 15-24 N=777	Border N=1332	Urban N=1301	Rural N=1339	Total N=3972
Watched Lusweti TV Show	19.9%	29.0%	31.5%	18.3%	34.5%	23.8%	24.6%

4.2 REACH

An important objective the evaluation is in estimating the total number of people reached by specific components of each partner's regimen of activities. This section discusses the estimated number of persons reached by components of the Lusweti/OneLove program. The total number of people reached by various interventions – as determined by self-reports from the questionnaire - are estimated through extrapolation of the weighted percentage of people who reported being exposed to each intervention component. Stata's *total* command (StataCorp, 2007: 492-497) is used to estimate the total number of people exposed to the intervention in the population by taking into account the sampling weights (which in turn are the inverse of the probability of selection). Results for the total population and specific target groups can be found in Appendix D. Survey data can only provide very rough estimates of the number of people reached. Consequently, the confidence intervals for estimates tend to be very wide, and estimates should be interpreted with caution.

According to provisional results from the 2007 Population and Housing Census, the total population of Swaziland is 953,524 inhabitants (unstats.un.org). According to the United Nations World Population Prospects (2010 revision), the total population increased to about 1,186,000 by 2010 (esa.un.org). The United States Census Bureau (USCB, 2012) estimates the 2011 population in Swaziland to have been 1,370,424 of which 707,414 were between the ages of 15-49 years. The results indicate that an estimated 466,101 people (220,914 men and 245,187 women) had heard of Lusweti and 430,570 knew the logo. Over 357,270 people had seen the OneLove logo. An estimated 108,140 people could recall the OneLove slogan spontaneously, and an additional 244,169 could recall the slogan after prompting.

The OneLove *Kuncono Mynye* and *Bagcwele I quantum* radio drama had the widest reach of all of the various interventions; an estimated 323,991 people (151,752 men and 172,239 women) heard the program. The Lusweti radio drama was heard by 320,185 people throughout the country while 160,041 people heard the *S'THRU Aw' kaphephi* talk show. An estimated 93,370 people heard the OneLove radio talk show.

Among print media, the most widely read booklet is *Love, Sex, and You*, with an estimated 180,369 readers (83,325 men and 97,044 women). This is followed by *How We Live and Love (156,488)*, *Indlela lesiphila ngayu (127,429), and S'THRU! Aw' khaphephi! (98,636).* The booklets with the lowest estimated reach is *You Haven't Met Joe (29,506)*.

An estimated 139,628 (56,082 men and 8,546 women) people watched the Love Stories film series. The most widely seen film was *Umshato* (102,889), followed by *Bloodlines* (99,040). The Untold Stories series was viewed by 135,776 people, with *Batjele* having the largest viewership (91,297 total, 27,898 men, and 63,399 women). The second most watched drama film was *Secrets and Lies* (66,51 total, 23,708 men, and 42,544 women). It is also estimated that 130,774 people saw the Lusweti television.

The most widely seen Champions advertisement was the one featuring Bishop Desmond Tutu, viewed by approximately 89,572 people. This was followed by the advertisement featuring Dr. Kenneth Kaunda (50,711 viewers). The Champions radio ad most recalled was also the one that featured Bishop Tutu (20,302 listeners).

4.3 RESULTS FOR GENERAL POPULATION (TOTAL, MALE, FEMALE)

Multivariate regression was used to determine associations between the exposure measures described above and all identified program outcomes. Results for health measures that are significantly associated with exposure to Lusweti/OneLove activities and a set of key programmatic outcomes, as well as non-significant results for key outcomes, are presented in this section. A full list of analyses for all measures for all health outcomes (i.e. including all non-significant measures) can be found in Appendix F.

The results from the multivariate models - including those for the full sample and then for men and women separately - are presented by health area (e.g., partnerships and sexual behavior, condom use). The results presented are for both the probit models that compare the measure of interest between those exposed and the unexposed group, and for the propensity score matching analysis, as described above. Propensity score matching results are for the total population only. Results are presented for all three populations (when sample size allows) even if the results are statistically significant for only one or two of the three populations. In the summary of results below the tables, however, only statistically significant results ($p<0.05$) are discussed. The only exception is for key program outcomes: multiple

partners in the last 12 months, multiple partners in the last month, currently having more than one partner, condom at last sex with regular partner, condom at last sex among those who report multiple partnerships, ever been tested for HIV, and tested for HIV in the last 12 months. Results for vulnerable populations (women aged 15-24 years and border populations) can be found in a subsequent section.

The following section presents the summary of the multivariate results for primary outcomes by analysis types and exposure to the various OneLove materials. Results are presented in the following order: multiple sexual partnerships, other HIV risk factors, condom use, HIV communication, HIV testing, HIV treatment, HIV stigma, and forced-sex and physical violence.

4.3.1 MULTIPLE PARTNERS

Table 6 shows estimates of the effects of exposure to OneLove radio on various partnership outcomes. The first panel shows the effect of exposure to one radio show versus no exposure; the second panel shows the effect of exposure to two or more radio shows versus no exposure.

For the total population, exposure to OneLove radio is associated with only a few of the indicators of multiple partnerships. Respondents who had low exposure to radio shows (i.e., those exposed to only one show) are less likely than unexposed respondents to report a 10+ year age difference with their most recent partner (11.3% versus 17.1%), more likely to report that they can resist the temptation of having sex with someone other than their main partner (84.7% versus 78.9%), and more likely to disagree that men with many women are real men (96.4% versus 92.1%). These effects are also confirmed by the PSM analyses. The probit regression results indicate that low exposure to OneLove radio shows does not have any effect on the other partnership indicators. However, in the PSM analyses some of these effects are significant, although not all of them are in the expected direction.

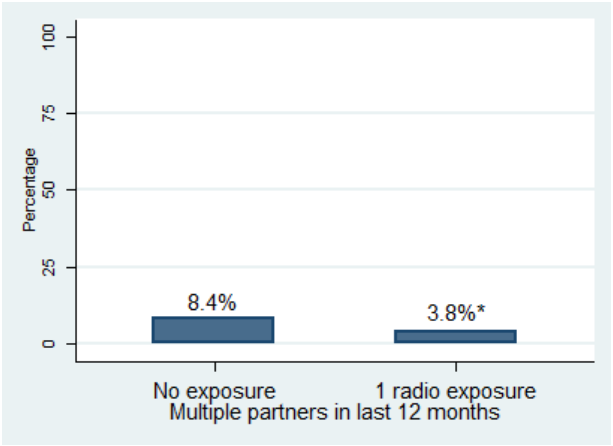
High exposure to OneLove radio shows (defined as being exposed to two or more radio shows) is associated with an increase in the percentage of respondents who report that leaders speak about the fact that having multiple partners is associated with an increased risk of HIV (75.9% versus 66.7%), that they discourage multiple partnerships (71.5% versus 38.3%), and discourage men from having younger partners (54.8% versus 44.0). These effects are confirmed by the PSM analyses. High exposure to OneLove radio shows does not have any effect on the other partnership indicators. In the PSM analyses, some of these effects are significant, although they are not always in the desired direction.

Breakdown by gender shows that the effect of exposure to OneLove radio programs on partnership outcomes varies by gender. Among men, low exposure to OneLove radio programs only affects two of the indicators, and both are unexpectedly in the wrong direction. Specifically, low exposure to radio programs is associated with an increase in the percentage of men who report having more than one partner in a 3-month period during the last year (22.3% versus 11.4%), and with a slight decrease in the percentage who agree that having multiple sexual partners increases the risk of HIV infection (93.1% versus 97.5%). Among men, low exposure to radio program does not affect any of the other partnership indicators.

High exposure to radio programs is associated with an increase in the percentage of men who report having multiple partners in the past month (13.6% versus 8.1%) and who report currently having more than one partner (19.4% versus 11.4%). However, high exposure to OneLove radio programs is also associated with an increase in the percentage of men who report that leaders discourage having multiple partners (59.0% versus 39.8%) and discourage men from having younger partners (64.1% versus 51.4%). Men who have high exposure to radio programs are more likely than unexposed men to report that polygamy is practiced in their community (47.4% versus 30.1%) and that widow inheritance is practiced (17.4% versus 11.2%). Among men, high exposure to OneLove radio program does not have any effect on the other partnership variables.

Among women, low exposure to OneLove radio shows is associated with positive treatment effects on several partnership outcomes. Women who were exposed to one of the OneLove radio shows are less likely to have had multiple partners in the past 12 months (3.8% versus 8.4%, Figure 3) and to have had more than one partner in a given 3-month period in the past year (1.5% versus 6.2%).

Figure 3: Radio exposure and multiple partners in the last 12 months, females



Women who had low exposure to OneLove radio programs are also less likely to report that there was an age gap of 10 or more years with their most recent partner (12.8% versus 21.7%). In addition, women who had low radio exposure are more likely to believe they can resist the temptation of having sex with someone other than their main partner (89.9% versus 82.8%), and more likely to disagree that men with

many women are real men (98.2% versus 94.7%).

Surprisingly, among women high exposure to OneLove radio programs affects only a few of the partnership outcomes. Women who were exposed to two or more radio programs are less likely than unexposed women to currently have more than one partner (1.3% versus 7.2%). They also report a slightly lower number of lifetime partners than unexposed women (1.9 partners versus 2.3 partners).

Table 6: Summary of multivariate results for radio exposure and MCP

	Total			Males		Female	
	Unexposed	Exposed	PSM	Unexposed	Exposed	Unexposed	Exposed
Exposure to One Radio Show (versus none)							
Multiple partners (past 12 months)	16.8%	14.8%	NS	25.4%	29.7%	8.4%	3.8%*
Multiple partners (past month)	5.7%	4.2%	NS	8.1%	9.0%		
More than one partner within 3 months period (past 12 months)	9.2%	10.7%	NS	11.4%	22.2%**	6.2%	1.5%**
Reports currently having more than one partner	10.6%	6.8%	-	11.4%	15.4%		
10+ year age difference between respondent and last sexual partner	17.1%	11.3%*	-	12.0%	8.9%	21.7%	12.8%*
Received gifts or money in exchange for sex with last partner	32.2%	29.8%	+	21.7%	20.6%	40.3%	36.8%
Multiple sexual partners increase HIV risk (%True)	95.7%	93.6%	NS	97.5%	93.1%*	93.2%	94.3%
Most married men faithful to wives (%Agree)	20.5%	18.7%	-	32.8%	33.2%	10.1%	5.7%
Can resist temptation of sex with person besides main partner (%Agree)	78.9%	84.7%*	+	74.4%	78.2%	82.8%	89.9%*
Need someone to fill gap (%Disagree)	61.8%	68.1%	+	55.4%	59.1%	67.7%	76.1%
Men with many women are real men (%Disagree)	92.1%	96.4%*	+	89.8%	94.2%	94.7%	98.2%**
Men have right to get sex for gifts (%Disagree)	79.2%	82.8%	+	71.9%	73.0%	85.6%	90.5%
Leaders discourage multiple partners (%Very often/sometimes)	38.3%	42.3%	-	39.8%	44.3%	38.6%	40.8%
Leaders discourage men from having younger partners (%Very often/sometimes)	44.0%	48.8%	-	51.4%	52.9%	39.3%	44.6%
Exposure to Two+ Radio Shows (versus none)							
Multiple partners (past 12 months)	16.8%	18.1%	NS	25.4%	34.9%	8.4%	7.5%
Multiple partners (past month)	5.7%	5.8%	NS	8.1%	13.6%*		
Reports currently having more than one partner	10.6%	8.0%	NS	11.4%	19.4%*		
Received gifts or money in exchange for sex with last partner	32.2%	29.2%	-	21.7%	16.1%	40.3%	39.5%

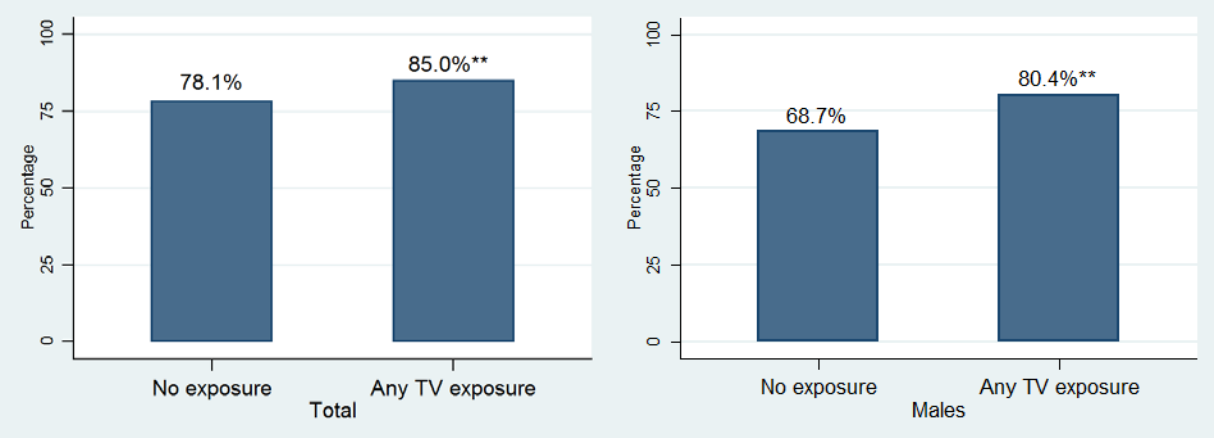
	Total			Males		Female	
	Unexposed	Exposed	PSM	Unexposed	Exposed	Unexposed	Exposed
Most married men faithful to wives (%Agree)	20.5%	23.8%	+	32.8%	36.7%	10.1%	12.1%
Leaders speak out about risk of HIV if MP (%Strongly agree/agree)	66.7%	75.9%*	+	71.3%	80.4%	65.4%	69.9%
Leaders discourage multiple partners (%Very often/sometimes)	38.3%	51.5%**	+	39.8%	59.0%**	38.6%	43.9%
Leaders discourage men from having younger partners (%Very often/sometimes)	44.0%	54.8**	+	51.4%	64.1%**	39.3%	45.9%
Polygamy is practiced in community (%Very often/sometimes)	32.3%	41.6%	+	30.1%	47.4%**	33.9%	37.5%
Agrees that wife inheritance is practiced in the community	14.9%	13.6%	NS	11.2%	17.4%*	18.2%	11.0%
Number of lifetime partners	3.8	3.2	NS	5.8	4.4	2.3	1.9*

*=p<0.05 **=p<0.01

PSM: + significant/increasing ; - significant/decreasing ;NS not significant

Exposure to any OneLove television program yielded positive effects on only two of the outcomes related to sexual partnerships, but only one of them is in the desired direction (Table 7). Among the total population, respondents who were exposed to television programs are more likely to disagree that men have the right to get sex in exchange for gifts (85.0% versus 78.1%); this effect is also observed among men (80.4% versus 68.7%, Figure 4).

Figure 4: Exposure to television and percentage who disagree with the statement that men have the right to sex in exchange for gifts, total and males



Among males, television exposure is also associated with an increase in the percentage who believe that having multiple partners increases the risk of HIV infection (97.8% versus 93.8%) and an increase in the percentage who report that leaders discourage multiple partnerships (53.0% versus 42.5%). However,

men who were exposed to television report a slightly earlier mean age at first intercourse than unexposed men (19.0 years of age versus 19.6 years).

Among women, television exposure is associated with an increase in the percentage who believe that their husband/cohabiting partner has another sex partner who is not a spouse (37.1% versus 24.0%), and with a slight increase in the percentage who disagree that men have the right to get sex in exchange for gifts (98.5% versus 95.2%). For women, television exposure has no effect on any of the other partnership outcomes.

Table 7: Summary of multivariate results for television exposure and MCP

	Total			Males		Female	
	Unexposed	Exposed	PSM	Unexposed	Exposed	Unexposed	Exposed
Exposed to Any Television (versus none)							
Multiple partners (past 12 months)	15.8%	16.9%	NS	28.6%	30.6%	6.6%	5.9%
Multiple partners (past month)	5.1%	4.9%	NS	9.5%	10.2%		
Reports currently having more than one partner	8.5%	7.3%	NS	15.8%	13.6%		
Agrees that husband/cohabitating partner has another sex partner who is not a wife	24.0%	37.1%*	NS			24.0%	37.1%*
Multiple sexual partners increase HIV risk (%True)	94.4%	95.0%	NS	93.8%	97.8**	95.1%	92.6%
Men with many women are real men (%Disagree)	93.4%	95.9%	NS	90.6%	93.5%	95.2%	98.5%**
Men have right to get sex for gifts (%Disagree)	78.1%	85.0%**	NS	68.7%	80.4%**	86.9%	88.9%
Leaders discourage multiple partners (%Very often/sometimes)	42.4%	45.7%	NS	42.5%	53.0%*	43.3%	38.2%
Age at first sex	18.8	18.6	NS	19.6	19.0*	18.2	18.2

*=p<0.05 **=p<0.01

PSM: + significant/increasing ; - significant/decreasing ;NS not significant

Print materials have strong impacts on several partnership outcomes, but not all of them are in the desired direction (Table 9). For example, for the total population, low exposure to OneLove booklets (defined as being exposed to only one booklet) is associated with a higher percentage of respondents who had multiple partners in the past 12 months (24.1% versus 13.7%), who had multiple partners in the past month (8.1% versus 3.5%), who had more than one partner during any 3-month period in the past year (18.6% versus 7.3%), and who currently have more than one partner (12.2% versus 6.4%). Some of these effects are also significant in the PSM analyses. Respondents who had low exposure to

OneLove booklets have a slightly lower mean age at first intercourse than unexposed respondents (18.3 versus 18.8 years of age).

Table 8: Summary of multivariate results for print exposure and MCP

	Total			Males		Female	
	Unexposed	Exposed	PSM	Unexposed	Exposed	Unexposed	Exposed
Exposure to One Booklet (versus none)							
Multiple partners (past 12 months)	13.7%	24.1%**	+	23.7%	46.9%*	6.0%	6.6%
Multiple partners (past month)	3.5%	8.1%**	NS	6.1%	15.5%**		
More than one partner within 3 months period (past 12 months)	7.3%	18.7%**	+	11.6%	32.5%**	3.8%	5.8%
Reports currently having more than one partner	6.4%	12.2%*	NS	10.5%	23.3%**		
Received gifts or money in exchange for sex with last partner	29.3%	33.9%	+	22.6%	16.7%	33.8%	49.8%*
Multiple sexual partners increase HIV risk (%True)	94.1%	94.8%	+	95.0%	96.3%	93.2%	94.8%
Men with many women are real men (%Disagree)	94.7%	90.6%	NS	92.6%	85.1%*	96.7%	95.3%
Leaders discourage men from having younger partners (%Very often/sometimes)	46.6%	42.2%	-	51.7%	47.4%	42.2%	37.4%
Polygamy is practiced in community (%Very often/sometimes)	35.5%	39.2%	NS	34.7%	46.8%*	35.6%	34.4%
Age at first sex	18.8	18.3*	NS	19.4	19.3	18.3	17.6**
Exposure to Two or More Booklets (versus none)							
Multiple partners (past 12 months)	13.7%	15.7%	NS	23.7%	27.5%	6.0%	6.7%
Multiple partners (past month)	3.5%	5.6%	NS	6.1%	12.1%**		
More than one partner within 3 months period (past 12 months)	7.3%	11.6%*	NS	11.6%	22.0**	3.8%	4.8%
Reports currently having more than one partner	6.4%	8.2%	NS	10.5%	16.5%*		
Agrees that husband/cohabitating partner has another wife	15.4%	27.9%*	NS			15.4%	27.9%*
10+ year age difference between respondent and last sexual partner	13.3%	16.1%	NS	11.9%	8.1%	14.9%	22.0%*
Can resist temptation of sex with person besides main partner (%Agree)	80.3%	83.4%	+	72.9%	79.0%	87.1%	87.5%
Men have right to get sex for gifts (%Disagree)	79.7%	82.6%	+	69.5%	77.0%*	88.2%	88.0%
Leaders speak out about risk of HIV if MP (%Strongly agree/agree)	66.9%	74.1%**	+	68.7%	81.0%**	65.5%	68.5%
Leaders discourage multiple partners (%Very often/sometimes)	43.2%	48.8%*	+	44.7%	53.8%*	42.3%	43.3%
Leaders discourage men from having younger partners (%Very often/sometimes)	46.6%	56.7%**	+	51.7%	65.5%**	42.2%	48.6%

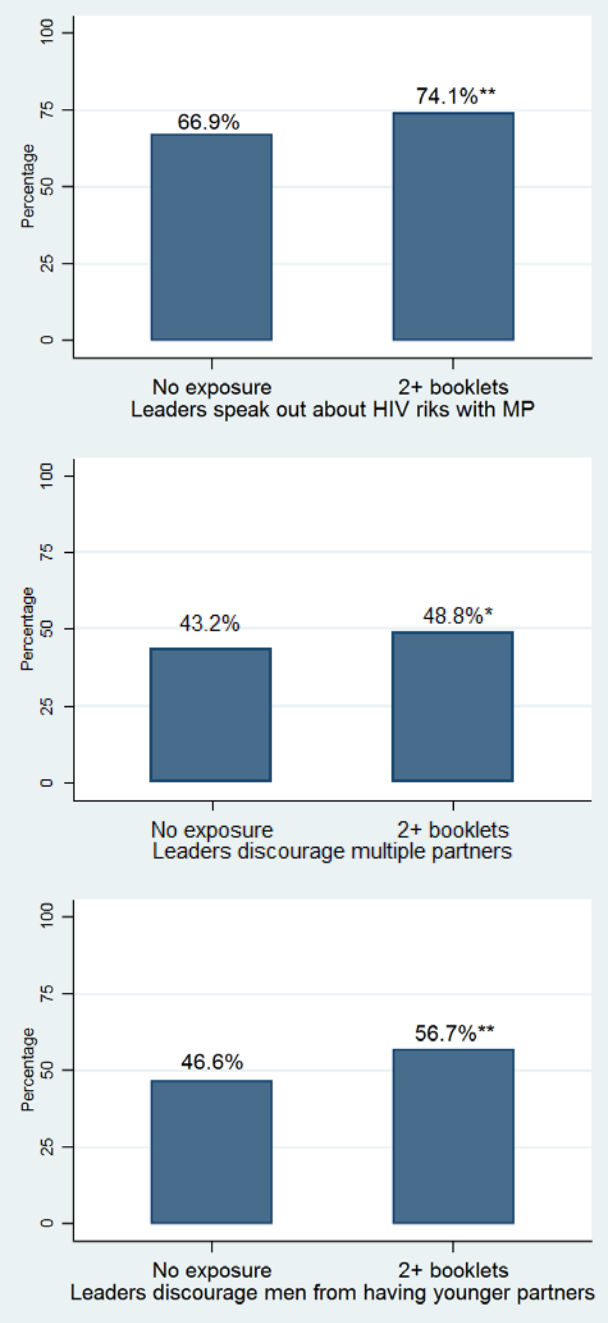
	Total			Males		Female	
	Unexposed	Exposed	PSM	Unexposed	Exposed	Unexposed	Exposed
Agrees that wife inheritance is practiced in the community	12.8%	17.1%*	NS	13.6%	15.3%	11.9%	18.5%*
Number of lifetime partners	3.2	3.7	NS	4.8	5.6	2.2	1.9%*

*=p<0.05 **=p<0.01

PSM: + significant/increasing ; - significant/decreasing ;NS not significant

High exposure to OneLove booklets (defined as being exposed to at least two of the booklets) is also associated with an increase in the percentage of respondents who report they had more than one partner during any 3-month period in the past year (11.6% versus 7.3%). However, this effect is not significant in the PSM analyses. High exposure to booklets has no effect on the other three indicators of multiple partnerships. Respondents who had high exposure to booklets are more likely to believe they can resist the temptation of having sex with someone other than their main partner (83.4% versus 80.3%), to believe that leaders speak out about the fact that multiple partnerships are associated with an increased HIV risk (74.1% versus 66.9%), that leaders discourage multiple partners (48.8% versus 43.2%) and that leaders discourage men from having younger partners (56.7% versus 46.6%, Figure 5). Several of the treatment effects on attitudinal outcomes are confirmed by the PSM analyses. However, respondents who had high booklet exposure are somewhat more likely than unexposed respondents to believe that widow inheritance is practiced in their community (17.1% versus 12.8%), although that effect is not significant in the PSM analysis.

Figure 5: Exposure to two or more booklets and MCP attitudes expressed by community leaders



Among males, there are significant treatment effects of exposure to OneLove booklets on several of the partnership indicators, but all are in the wrong direction. Low exposure to booklets is associated with an increase in the percentage of men who had multiple partners in the past 12 months (47.0% versus 23.7%), who had multiple partners in the past month (15.5% versus 6.1%), who had multiple partners during any 3-month period in the past year (32.5% versus 11.6%), and who report currently having more than one partner (23.3% versus 10.5%). Low exposure to booklets is also associated with a lower

percentage of men disagreeing that men with any women are real men (85.1% versus 92.6%), and with an increase in the percentage who believe polygamy is practiced in their community (46.8% versus 34.7%).

High exposure to OneLove booklets is also associated with increases in the likelihood that men had multiple partners. Specifically, men who had high booklet exposure are more likely to have had multiple partners in the past month (12.1% versus 6.1%), more likely to have had multiple partners during any 3-month period in the past year (22.0% versus 11.6%), and more likely to report currently having multiple partners (16.5% versus 10.5%). However, men with high booklet exposure are more likely to disagree that men have the right to get sex in exchange for gifts (77.0% versus 69.5%), more likely to believe that leaders speak out the risk of HIV infection associated with multiple partnerships (81.0% versus 68.7%), that leaders discourage multiple partnerships (53.8% versus 44.7%), and that leaders discourage men from having younger partners (65.5% versus 51.7%).

Among women, low exposure to booklets has no effect on most of the partnership outcomes. However, there are undesired effects on two of the measures. Women who had low exposure to OneLove booklets are more likely than unexposed women to have received gifts or money in exchange for sex with their past partner (49.8% versus 33.8%). Exposed women also have a lower mean age at first intercourse than unexposed women (17.6 years of age versus 18.4 years).

Women who had high exposure to OneLove booklets are more likely than unexposed women to report that their husband or cohabiting partner has another wife (27.9% versus 15.4%), and to report that there was an age gap of at least 10 years with their last sexual partner (22.0% versus 14.9%). High exposure to booklets is also associated with an increased percentage of women who report that widow inheritance is practiced in their community (18.5% versus 11.9%). However, women who had high booklet exposure report fewer life time partners than unexposed women (1.9 partners versus 2.2 partners, on average).

Table 9 presents the multivariate results from exposure to OneLove media channels on various partnership outcomes. For the total population, exposure to a single OneLove media channel does not have a significant effect on any of the partnership outcomes. For all but one outcome, these findings are confirmed by the PSM analyses. Exposure to two or more OneLove media channels has desirable effects for some outcomes, but undesirable effects for others. For example, exposure to multiple media is associated with an increase in the percentage who reported having multiple partners during any 3-

month period in the past year (13.7% vs. 4.8%) and an increase in the average number of lifetime partners (3.8 vs. 2.5 partners). On the positive side, exposure to multiple media is associated with an increase in the percentage who believe they can resist the temptation of having sex with someone other than their main partner (84.2% vs. 78.4%), and an increase in the percentage who disagree that men have the right to get sex in exchange for gifts (83.2% vs. 73.8%).

Table 9: Summary of multivariate results for multimedia exposure and MCP

	Total			Males		Female	
	Unexposed	Exposed	PSM	Unexposed	Exposed	Unexposed	Exposed
Exposure to One Media Channel (versus none)							
Multiple partners (past 12 months)	13.4%	14.6%	NS	20.7%	24.5%	8.4%	6.2%
Multiple partners (past month)	5.0%	4.0%	NS	6.9%	6.7%		
More than one partner within 3 months period (past 12 months)	4.8%	9.8%	NS	5.7%	14.8%**	3.7%	5.5%
Reports currently having more than one partner	10.1%	6.0%	NS	9.4%	11.7%		
10+ year age difference between respondent and last sexual partner	12.7%	13.3%	-	12.3%	11.4%	15.4%	13.7%
Received gifts or money in exchange for sex with last partner	27.6%	33.6%	NS	25.2%	23.0%	28.8%	41.4%*
Men with many women are real men (%Disagree)	90.7%	95.2%	NS	90.2%	92.8%	91.6%	96.7%**
Men have right to get sex for gifts (%Disagree)	73.8%	81.3%	NS	60.0%	73.7%**	86.6%	87.3%
Leaders discourage multiple partners (%Very often/sometimes)	38.4%	42.5%	NS	34.6%	45.7%*	44.6%	40.1%
Exposure to Two or More Media Channels (versus none)							
Multiple partners (past 12 months)	13.4%	18.3%	NS	20.7%	35.3%*	8.4%	5.8%
Multiple partners (past month)	5.0%	5.6%	NS	6.9%	12.4%		
More than one partner within 3 months period (past 12 months)	4.8%	13.7%**	NS	5.7%	26.6%**	3.7%	3.8%
Reports currently having more than one partner	10.1%	8.7%	NS	9.4%	18.7%*		
Agrees that husband/cohabitating partner has another wife	13.9%	24.2%*	NS			13.9%	24.2%*
Thinks that last partner had other sexual partners	50.3%	46.3%	NS	43.6%	33.7%*	53.3%	57.2%
Received gifts or money in exchange for sex with last partner	27.6%	29.3%	+	25.2%	16.8%	28.8%	39.8%
Can resist temptation of sex with person besides main partner (%Agree)	78.4%	84.2%*	+	72.5%	80.0%	82.9%	87.5%
Men with many women are real men (%Disagree)	90.7%	95.0%	+	90.2%	91.6%	91.6%	97.9%**

	Total			Males		Female	
	Unexposed	Exposed	PSM	Unexposed	Exposed	Unexposed	Exposed
Men have right to get sex for gifts (%Disagree)	73.8%	83.2%*	+	60.0%	77.9%**	86.6%	88.4%
Leaders speak out about risk of HIV if MP (%Strongly agree/agree)	67.0%	71.2%	+	67.2%	76.1%*	68.3%	66.7%
Leaders discourage multiple partners (%Very often/sometimes)	38.4%	46.0%	+	34.6%	50.8%**	44.6%	41.1%
Leaders discourage men from having younger partners (%Very often/sometimes)	48.2%	52.0%	+	51.1%	58.5%	46.7%	45.7%
Number of lifetime partners	2.5	3.8*	NS	3.5	5.7*	2.2	2.0

*=p<0.05 **=p<0.01

PSM: + significant/increasing ; - significant/decreasing ;NS not significant

Breakdown by gender reveals that exposure to OneLove through a single media channel does have some significant effects. Among men, exposure to one media channel is associated with an increase in the percentage who report having multiple partners during any 3-month period in the past year (14.8% versus 5.7%). However, on the positive side it is also associated with an increase in the percentage of men who disagree that men have the right to get sex in exchange for gifts (73.7% versus 60.0%), and who believe that their leaders discourage multiple partnerships (45.7% versus 34.6%).

Exposure to two or more media channels once again reveals some undesirable effects on indicators of men's engagement in multiple partnerships. Men who were exposed to two or more media channels are more likely to have had multiple partners in the past 12 months (35.3% versus 20.7%), to have had multiple partners during any 3-month period in the past year (26.6% versus 5.7%), and to currently have more than one partner (18.7% versus 9.4%). Men who were exposed to two or more OneLove media channels report a higher number of lifetime partners than unexposed men (5.7 partners versus 3.5 partners). At the same time, men who were exposed to two or more media channels are less likely to believe their past partner had other partners (33.7% versus. 43.6%), more likely to disagree that men have the right to get sex in exchange for gifts (78.9% versus 60.0%), more likely to agree that leaders comment on the increased risk of HIV that stems from having multiple partners (76.1% versus 67.2%), and that leaders discourage multiple partnerships (50.8% versus 34.6%).

No effect is observed of multichannel exposure and other indicators of women's engagement in multiple partnerships. But women who were exposed to one channel are more likely to report having received gifts or money in exchange for sex with their last partner (41.4% vs. 28.8%) and are more likely to

disagree that men with many women are real men (96.7% vs. 91.6%). Women who were exposed to multiple channels are more likely to believe that their husband or cohabiting partner has another wife (24.2% vs. 13.9%). They are also somewhat more likely to disagree that men with many women are real men (97.9% vs. 91.6%).

4.3.2 OTHER HIV RISK FACTORS

It is hypothesized that increased exposure to Lusweti/OneLove programming will increase knowledge about HIV and also raise awareness of potential risk, including increasing worry about becoming infected. In the PSM analysis, exposure to one radio program is found to significantly affect the likelihood of worrying about becoming infected with HIV but this is not significant in the probit analysis or for males and females (Table 10). A higher percentage of respondents exposed to one radio program (73.3% versus 65.5%) know that the statement *if one spouse/cohabitating sexual partner is HIV positive, the other is HIV positive as well* is false; this is also observed among men and women. While the effect of one radio program is significant on these indicators, the same is not true for the exposure to two or more radio programs. In fact, the PSM results suggest that there is a negative effect of exposure to two or more radio programs. Finally, women exposed to two or more radio programs are more likely to know (11 percentage point difference) that the statement *TB can't be cured if you are HIV positive* is false than unexposed women.

Table 10: Summary of multivariate results for radio exposure and other HIV risk factors

	Total			Males		Female	
	Unexposed	Exposed	PSM	Unexposed	Exposed	Unexposed	Exposed
Exposure to One Radio Show (versus none)							
Worried about becoming HIV infected (%Worried)	46.1%	51.3%	+	43.8%	54.4%	49.1%	47.9%
If one spouse positive, the other too (%False)	65.5%	73.%3**	+	58.9%	64.9%*	71.0%	82.3%**
Exposure to Two+ Radio Shows (versus none)							
Worried about becoming HIV infected (%Worried)	46.1%	46.0%	-	43.8%	38.2%	49.1%	51.5%
If one spouse positive, the other too (%False)	65.5%	68.3%	-	58.9%	53.6%	71.0%	79.0%
TB can't be cured if HIV+ (%False)	58.3%	61.1%	NS	60.5%	54.2%	55.0%	66.9%*

*=p<0.05 **=p<0.01

PSM: + significant/increasing ; - significant/decreasing ;NS not significant

Television exposure has a positive treatment effect on knowing where to get information about HIV (Table 11). This effect is seen for the total population and when examined separately by gender. The difference is greater for men (96.5% exposed versus 86.6% unexposed) than for women (94.3% versus

89.8%). The PSM results confirm this finding in the total population. A higher percentage of men exposed to television programming know that the statement *if one spouse/cohabitating sexual partner is HIV positive, the other is HIV positive as well* is false; this difference is 12 percentage points. While not significant in the probit multivariate analysis, the PSM results also indicate a positive effect among the total population for knowing that this statement is false.

Table 11: Summary of multivariate results for television exposure and other HIV risk factors

	Total			Males		Female	
	Unexposed	Exposed	PSM	Unexposed	Exposed	Unexposed	Exposed
Exposed to Any Television (versus none)							
If one spouse positive, the other too (%False)	68.0%	71.7%	+	55.3%	67.1%**	80.2%	74.2%
Knows where to get information about HIV/AIDS	88.5%	95.0%**	+	86.6%	96.5%**	89.8%	94.3%*

*=p<0.05 **=p<0.01

PSM: + significant/increasing ; - significant/decreasing ;NS not significant

Respondents exposed to one booklet are more likely to report being worried about becoming infected with HIV (58.2% versus 45.2%), and this finding is confirmed with the PSM analysis (Table 12). The effect of exposure to two or more booklets is not significant for this outcome in the probit analysis but there is a negative and significant PSM result. The strongest effect observed is that of exposure to one booklet. For example, 94.3% of exposed respondents know that the risk of contracting HIV decreases for a circumcised man as compared with 87.7% of unexposed respondents. This is confirmed by the PSM results, and the effect is also seen among men (94.8% versus 88.3%) and women (92.8% versus 87.2%). It is hypothesized that knowledge about where to get information about HIV/AIDS increases with increased exposure to print materials but this is not the case here. Men exposed to one booklet are less likely to know than unexposed men where to get information about HIV/AIDS (-9 percentage point difference). However, men exposed to two or more booklets are more likely to know where to get information (3 percentage point difference).

Table 12: Summary of multivariate results for print exposure and other HIV risk factors

	Total			Males		Female	
	Unexposed	Exposed	PSM	Unexposed	Exposed	Unexposed	Exposed
Exposure to One Booklet (versus none)							
Worried about becoming HIV infected (%Worried)	45.2%	58.2%*	+	45.1%	58.6%	45.3%	58.0%
Risk of contracting HIV decreases for a circumcised man	87.7%	94.3%**	+	88.3%	94.8%**	87.2%	92.8%*

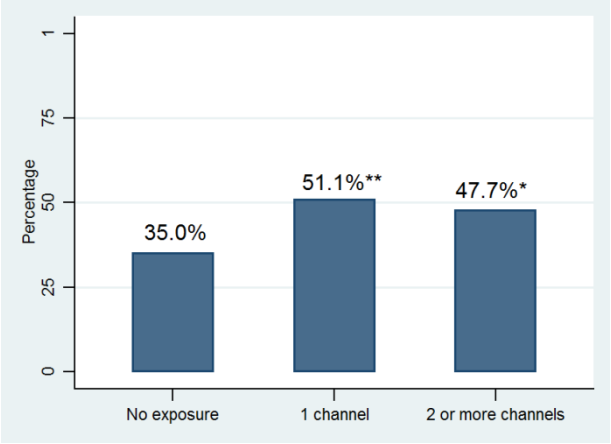
	Total			Males		Female	
	Unexposed	Exposed	PSM	Unexposed	Exposed	Unexposed	Exposed
Knows where to get information about HIV/AIDS	90.8%	89.0%	NS	90.4%	81.4%**	91.6%	95.0%
Exposure to Two or More Booklets (versus none)							
Worried about becoming HIV infected (%Worried)	45.2%	46.8%	-	45.1%	41.6%	45.3%	51.1%
If one spouse positive, the other too (%False)	70.7%	66.6%	NS	58.6%	59.4%	81.2%	72.5%*
Knows where to get information about HIV/AIDS	90.8%	90.8%	NS	90.4%	93.8%*	91.6%	88.1%

*=p<0.05 **=p<0.01

PSM: + significant/increasing ; - significant/decreasing ;NS not significant

Multimedia exposure has a positive effect on various outcomes. For example, men exposed to one and two or more media channels are more likely to report being worried about becoming infected with HIV (see Figure 6). Exposure to two or more media channels on this outcome is also significant for the total population, 50.9% of exposed respondents as compared with 38.4 % of the unexposed. It is also true that respondents exposed at either level are more likely to agree that they are likely to be infected now. This difference is not significant among men, but it is at both levels of exposure for women. For example, the difference for women exposed to both levels of exposure as compared with unexposed women is 9 percentage points.

Figure 6: Percentage of men worried about becoming infected with HIV/AIDS, by multichannel exposure



There are also differences by gender for several of the knowledge outcomes. The results indicate that 93.4% of women exposed to one media channel know that the statement *STIs decrease the risk of HIV infection* is false as compared with 86.4% of unexposed women. This is not significant among men. However, a significantly lower percentage (-11.2 percentage points) of men exposed to one media channel know that the statement *TB can't be cured if you are HIV positive* is false. A higher percentage of women (11.5 percentage point difference) exposed to one multimedia channel report knowing where to get information about HIV/AIDS than unexposed women. This effect is also significant for the total population in both the probit and PSM results, but is not statistically significant among men.

Table 13: Summary of multivariate results for multimedia exposure and other HIV risk factors

	Total			Males		Female	
	Unexposed	Exposed	PSM	Unexposed	Exposed	Unexposed	Exposed
Exposure to One Media Channel (versus none)							
Worried about becoming HIV infected (%Worried)	38.4%	47.9%	NS	35.0%	51.1%**	43.6%	44.0%
Likely to be infected now (%Agree)	15.2%	23.2%*	NS	10.4%	15.2%	20.8%	29.9%*
STIs decrease HIV infection (%False)	89.9%	92.4%	NS	94.1%	91.7%	86.4%	93.4%**
TB can't be cured if HIV+ (%False)	62.2%	56.1%	NS	67.5%	56.3%*	51.7%	56.0%
Knows where to get information about HIV/AIDS	86.2%	93.3%**	+	88.4%	90.1%	84.0%	95.5%**
Exposure to Two or More Media Channels (versus none)							
Worried about becoming HIV infected (%Worried)	38.4%	50.9%**	NS	35.0%	47.7%*	43.6%	53.7%
Likely to be infected now (%Agree)	15.2%	22.0%**	NS	10.4%	13.4%	20.8%	29.6%*
If one spouse positive, the other too (%False)	62.8%	70.7%*	+	50.4%	62.7%*	73.6%	77.3%
Risk of contracting HIV decreases for a circumcised man	86.8%	90.7%*	+	87.0%	91.1%	88.7%	89.7%

*=p<0.05 **=p<0.01

PSM: + significant/increasing ; - significant/decreasing ;NS not significant

Exposure to two or more media channels has a positive treatment effect on two knowledge indicators: knowing that it is false to think that if a spouse is HIV positive then his/her partner is too (7.9 percentage point difference) and knowing that the risk of HIV is lower for men who have been circumcised (4 percentage point difference). The PSM results confirm these findings.

4.3.3 CONDOM USE

When examining the probit regression results for the total sample, positive treatment effects are observed for only a few of the condom use behavior measures. The PSM results confirm that exposure to just one of the OneLove radio shows has no effect on most condom use measures when examining the total population, but suggest that exposure to two or more radio shows does have an effect. Specifically, the results show that exposure to one of the OneLove radio shows has no effect on condom use at last sex, condom use at last sex with a regular partner, nor on condom use at last sex among respondents with multiple partners. The PSM results confirm that there is no significant effect.

The effect of exposure to one radio show on the perception that condom use in marriage is accepted are inconsistent. Respondents exposed to a single OneLove radio show are more likely than unexposed respondents to agree or strongly agree that condom use in marriage is accepted (76.4% versus 68.7%),

but the effect is not significant in the PSM analyses. Contrary to hypothesis, respondents who were exposed to one of the radio shows are less likely than others to agree or strongly agree that women can ask a casual partner to use a condom (46.2% versus 53.3%); this negative effect is confirmed by the PSM analysis.

The second panel of Table 14 shows the effect of exposure to two or more of the OneLove radio shows on the indicators of condom use (as compared with unexposed respondents). The results show that respondents who were exposed to two or more radio shows are more likely than unexposed respondents to have used a condom at last sex (67.3% versus 60.4%), which is confirmed by the PSM analyses. Similarly, respondents exposed to two or more radio shows are more likely than unexposed respondents to have used a condom at last sex with a regular partner (64.5% versus 55.5%). This result is also confirmed by the PSM analyses. However, among the subgroup of respondents who report having multiple partners, there is no effect on condom use at last sex.

The probit regression results indicate that exposure to two or more radio shows has no effect on consistent condom use, the perception that condom use in marriage is accepted, or on the perception that women can ask regular and casual partners to use a condom. Although the probit regression results show no effects on these four indicators, the PSM analyses suggest that there are positive treatment effects for all four of these indicators.

Table 14: Summary of multivariate results for radio exposure and condom use

	Total			Males		Female	
	Unexposed	Exposed	PSM	Unexposed	Exposed	Unexposed	Exposed
Exposure to One Radio Show (versus none)							
Condom use at last sex	60.4%	62.2%	NS	57.6%	71.5%**	62.6%	54.1%
Condom use at last sex with regular partner	55.5%	57.9%	NS	53.4%	63.2%*	58.4%	53.5%
Condom use at last sex among those with multiple partners	71.8%	77.8%	NS	66.3%	80.0%*		
Condom use in marriage accepted (%Strongly agree/agree)	68.7%	76.4%**	NS	65.8%	75.8%**	71.4%	77.2%
Women can ask casual partner to use condom (%Strongly agree/agree)	53.3%	46.2%*	-	59.9%	53.1%	47.2%	40.7%
Exposure to Two+ Radio Shows (versus none)							
Condom use at last sex	60.4%	67.3%*	+	57.6%	73.9%**	62.6%	63.1%
Condom use at last sex with regular partner	55.5%	64.5%**	+	53.4%	68.6%**	58.4%	60.7%
Condom use at last sex among those with multiple partners	71.8%	76.0%	NS	66.3%	72.5%		
Always uses condom with most recent partner	26.5%	31.4%	+	29.3%	36.6%	23.6%	27.2%

	Total			Males		Female	
	Unexposed	Exposed	PSM	Unexposed	Exposed	Unexposed	Exposed
Condom use in marriage accepted (%Strongly agree/agree)	68.7%	75.9%	+	65.8%	81.1%**	71.4%	71.8%
Women can ask regular partner to use condom (%Strongly agree/agree)	68.3%	72.5%	+	66.4%	81.5%**	69.6%	65.7%
Women can ask casual partner to use condom (%Strongly agree/agree)	53.3%	55.1%	+	59.9%	60.3%	47.2%	50.1%

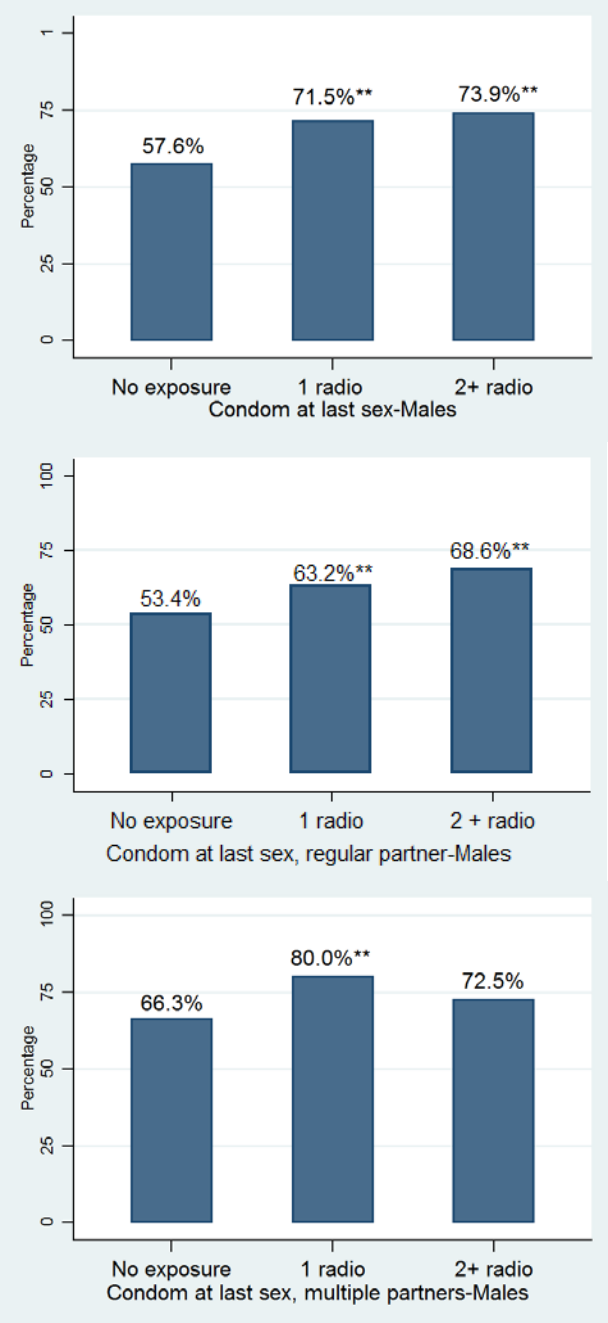
*=p<0.05 **=p<0.01

PSM: + significant/increasing ; - significant/decreasing ;NS not significant

Disaggregation by gender indicates that exposure to OneLove radio shows has positive effects on several condom use indicators for males, but not for females. As seen in Figure 7, exposure to even a single radio show among males has a positive effect on condom use at last sex (71.5% versus 57.6%), condom use at last sex with a regular partner (63.2% versus 53.4%), condom use at last sex among respondents with multiple partners (80.0% versus 66.3%), as well as on the belief that condom use in marriage is accepted (75.8% versus 65.8%). Exposure to one radio show has no effect on men's perception that women can ask a casual partner to use a condom.

As anticipated, males who were exposed to two or more radio shows are more likely than unexposed males to have used a condom at last sex (73.9% versus 57.6%) and to have used a condom at last sex with their regular partner (68.6% versus 53.4%). However, exposure to two or more radio show has no effect on condom use at last sex among men who had multiple partners, nor on consistent condom use. Exposure to two or more radio shows has a positive effect on men's perception that condom use in marriage is accepted (81.1% versus 65.8%). It also has a positive effect on men's perception that women can ask their regular partner to use a condom (81.5% versus 66.4%), but not on the perception that women can ask this of a casual partner.

Figure 7: Exposure to Lusweti/OneLove radio programming and condom use among men



For the total sample, exposure to any OneLove television program has no significant effect on condom use at last sex, condom use at last sex with a regular partner, nor on condom use at last sex among those respondents who report having multiple partners (Table 15). These results are confirmed by both the probit regression and PSM analyses. Exposure to television programs has a positive treatment effect

on the perception that condom use in marriage is accepted (79.0% versus 69.6%) and on the perception that women can ask their regular partner to use a condom (76.1% versus 68.4%). However, in the PSM analyses neither of these two effects is statistically significant. Moreover, while the probit regression analysis found no treatment effect on the perception that women can ask a casual partner to use a condom, the PSM analysis found a negative treatment effect.

Table 15: Summary of multivariate results for television exposure and condom use

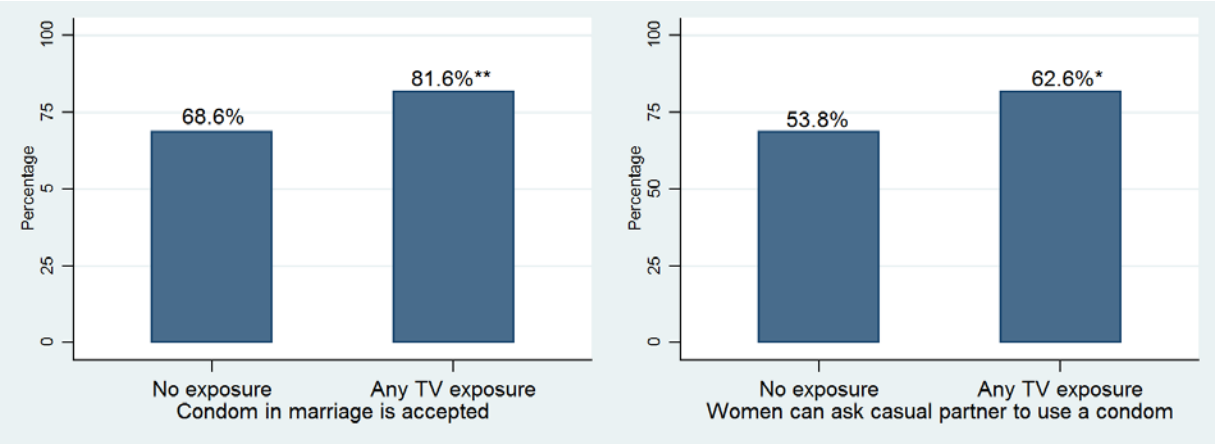
	Total			Males		Female	
	Unexposed	Exposed	PSM	Unexposed	Exposed	Unexposed	Exposed
Exposed to Any Television (versus none)							
Condom use at last sex	64.1%	62.4%	NS	66.2%	70.3%	61.8%	57.3%
Condom use at last sex with regular partner	59.4%	59.4%	NS	61.5%	62.1%	56.9%	58.5%
Condom use at last sex among those with multiple partners	75.8%	73.7%	NS	73.0%	74.1%		
Condom use in marriage accepted (%Strongly agree/agree)	69.6%	79.0%**	NS	68.6%	81.6%**	72.3%	74.7%
Women can ask regular partner to use condom (%Strongly agree/agree)	68.4%	76.1%*	NS	68.6%	81.1%*	69.7%	70.1%
Women can ask casual partner to use condom (%Strongly agree/agree)	49.9%	52.8%	-	53.8%	62.6%*	48.8%	41.4%

*=p<0.05 **=p<0.01

PSM: + significant/increasing ; - significant/decreasing ;NS not significant

As was the case for radio exposure, disaggregation by gender shows that among women television exposure has no effect on any of the condom use indicators. Among men, television exposure has no effect on condom use at last sex, condom use at last sex with a regular partner, nor on condom use at last sex among those men who had multiple partners. However, television exposure has a positive treatment effect on men's perception that condom use in marriage is accepted (81.6% versus 68.6%, Figure 8), that women can ask their regular partner to use a condom (81.1% versus 68.6%), and that women can ask a casual partner to use a condom (62.6% versus 53.8%).

Figure 8: Exposure to Lusweti/OneLove television and condom use norms among men



When examining the total population, exposure to OneLove booklets has a positive treatment effect for only a few of the condom use variables. Specifically, respondents who have read just one of the booklets are more likely than unexposed respondents to have used a condom at last sex (69.2% versus 60.8%), although the effect is not significant in the PSM analysis. Exposure to one booklet does not have any effect on condom use at last sex with a regular partner, nor on condom use at last sex among respondents who have multiple partners. The PSM analyses confirm these findings. The PSM analyses also suggest that reading one booklet has a positive treatment effect on condom use at last sex with a regular partner among those respondents who have multiple partners, as well as a positive treatment effect on the perception that condom use in marriage is accepted and that women can ask their regular partner to use a condom. However, these effects are not significant in the probit regression analyses.

The probit results as well as the PSM results suggest that exposure to two or more OneLove booklets has no significant effect on condom use at last sex, condom use at last sex with a regular partner, nor on condom use at last sex among multiple partners. The probit results also show a negative treatment effect on condom use at last sex with a regular partner, among respondents with multiple partners (53.9% versus 65.5%), but this difference is not significant in the PSM analysis. Exposure to two or more booklets has no significant effect on the perception that condom use in marriage is accepted, nor on the perception that women can ask their regular partner to use a condom. The PSM analysis suggests that there is a positive treatment effect on both of these indicators.

Table 16: **Summary of multivariate results for print exposure and condom use**

	Total			Males		Female	
	Unexposed	Exposed	PSM	Unexposed	Exposed	Unexposed	Exposed
Exposure to One Booklet (versus none)							
Condom use at last sex	60.8%	69.2%*	NS	65.4%	73.3%	57.3%	64.1%
Condom use at last sex with regular partner	58.2%	60.8%	NS	62.2%	58.5%	54.9%	63.7%
Condom use at last sex among those with multiple partners	71.7%	80.3%	NS	70.0%	78.9%		
Condom use at last sex with a regular partner, among those with multiple partners	65.5%	57.4%	+	66.0%	51.2%*		
Condom use in marriage accepted (%Strongly agree/agree)	70.9%	78.2%	+	67.7%	81.8%**	74.4%	74.0%
Women can ask regular partner to use condom (%Strongly agree/agree)	69.8%	75.9%	+	69.3%	80.5%*	70.4%	71.3%
Exposure to Two or More Booklets (versus none)							
Condom use at last sex	60.8%	63.6%	NS	65.4%	67.6%	57.3%	61.6%
Condom use at last sex with regular partner	58.2%	60.2%	NS	62.2%	62.6%	54.9%	58.0%
Condom use at last sex among those with multiple partners	71.7%	76.1%	NS	70.0%	73.4%		
Condom use at last sex with a regular partner, among those with multiple partners	65.5%	53.9%*	NS	66.0%	53.7%*		
Condom use in marriage accepted (%Strongly agree/agree)	70.9%	75.4%	+	67.7%	78.6%**	74.4%	71.8%
Women can ask regular partner to use condom (%Strongly agree/agree)	69.8%	72.4%	+	69.3%	76.2%	70.4%	68.9%

*=p<0.05 **=p<0.01

PSM: + significant/increasing ; - significant/decreasing ;NS not significant

Disaggregation by gender once again shows that among women there are no significant treatment effects of exposure to OneLove booklets on any of the condom use variables, but that positive treatment effects do exist for men. Specifically, men who were exposed to one booklet are more likely than unexposed men to believe that condom use in marriage is accepted (81.8% versus 67.7%) and that women can ask their regular partner to use a condom (80.5% versus 69.3%). Men exposed to two or more booklets are also more likely than unexposed men to believe that condom use in marriage is accepted (78.6% versus 67.7%), but exposure to at least two booklets does not have a significant effect on men's belief that women can ask their regular partner to use a condom.

The results also suggest that exposure to OneLove booklets has a negative treatment effect on condom use at last sex for those men who report having multiple partners. Specifically, men with multiple partners who were exposed to one booklet are less likely than unexposed men to have used a condom

in last sex with a regular partner (51.2% versus 66.0%). Similarly men with multiple partners who were exposed to two or more booklets are less likely than unexposed men to have used a condom in last sex (53.7% versus 66.0%). Exposure to booklets does not have a significant effect on any of the other condom use variables.

Positive effects of exposure to one or more media channels on condom use behaviors are evident among the total population, men, and women (Table 17). For the total population, exposure to one of the OneLove media channels is associated with increased condom use at last sex with a regular partner (63.1% vs. 53.0%), and with an increased perception that condom use in marriage is accepted (71.4% vs. 63.3%) and that women can ask their regular partner to use a condom (71.0% vs. 62.8%). However, these effects are not significant in the PSM analyses. In the probit analyses, exposure to two or more OneLove media channels does not have a significant effect on any of the condom use variables. Nevertheless, the PSM analysis suggests that positive treatment effects exist for the perception that condom use in marriage is accepted and that women can ask their regular partner to use a condom.

Table 17: Summary of multivariate results for multimedia exposure and condom use

	Total			Males		Female	
	Unexposed	Exposed	PSM	Unexposed	Exposed	Unexposed	Exposed
Exposure to One Media Channel (versus none)							
Condom use at last sex	57.7%	64.4%	NS	56.7%	67.3%	59.5%	61.8%
Condom use at last sex with regular partner	53.0%	63.1%*	NS	54.8%	66.2%*	52.7%	59.7%
Condom use at last sex among those with multiple partners	69.3%	76.8%	NS	63.9%	71.3%		
Condom use in marriage accepted (%Strongly agree/agree)	63.3%	71.4%*	NS	55.8%	70.7%**	73.2%	72.4%
Women can ask regular partner to use condom (%Strongly agree/agree)	62.8%	71.0%*	NS	58.4%	71.1%*	68.1%	71.5%
Exposure to Two or More Media Channels (versus none)							
Condom use at last sex	57.7%	64.6%	NS	56.7%	71.5%*	59.5%	59.1%
Condom use at last sex with regular partner	53.0%	59.0%	NS	54.8%	61.2%	52.7%	57.6%
Condom use at last sex among those with multiple partners	69.3%	76.4%	NS	63.9%	76.9%		
Condom use in marriage accepted (%Strongly agree/agree)	63.3%	78.3%*	+	55.8%	82.1%	73.2%	74.2%
Women can ask regular partner to use condom (%Strongly agree/agree)	62.8%	74.5%	+	58.4%	80.3%	68.1%	69.2%

*=p<0.05 **=p<0.01

PSM: + significant/increasing ; - significant/decreasing ;NS not significant

Consistent with the earlier findings, exposure to OneLove media channels has significant treatment effects among men, but not among women. Men who were exposed to one channel are more likely than unexposed men to have used a condom in last sex with a regular partner (66.2% vs. 54.8%), more likely to believe that condom use in marriage is accepted (70.7% vs. 55.8%), and more likely to believe that women can ask their regular partner to use a condom (71.1% vs. 58.4%). Men exposed to two or more media channels are also more likely to have used a condom at last sex (71.5% versus 56.7%).

4.3.4 HIV COMMUNICATION

Exposure to radio shows has a significant effect on increased discussion about HIV/AIDS with friends, spouses, and children among the total population (Table 18). The difference for discussion with friends is 5 percentage points for both levels of radio exposure; the difference for discussion with spouse, children, or friends is smaller at around 4 percentage points for each level of exposure. The only gender difference among the discussion outcomes is among men who have been exposed to two or more radio programs; 87.4% of the exposed report discussing HIV/AIDS with a spouse, children, or friends as compared with 81.1% of the unexposed. While not significant in the multivariate regression analysis, exposure to one radio program was found to be positively and significantly related to outcomes that deal with communication with sexual partners in the PSM analysis. There is a 2 percentage point difference between the exposed and the unexposed in the percentage who agree that one's sex life can improve with partner communication. A higher percentage of exposed respondents report being sexually dissatisfied with their spouse or regular partner (26.1% versus 20.6%), but exposed respondents are also more likely to report having discussions with their partners about sexual satisfaction (81.7% versus 72.1%). This significant effect is also observed among women; 72.7% of women exposed to one radio show report discussing sexual satisfaction with their partners as compared with 60.0% of unexposed women.

Table 18: Summary of multivariate results for radio exposure and HIV communication

	Total			Males		Female	
	Unexposed	Exposed	PSM	Unexposed	Exposed	Unexposed	Exposed
Exposure to One Radio Show (versus none)							
Discussed HIV/AIDS with friends	74.8%	79.8%*	NS	78.7%	80.2%	72.8%	78.6%
Discussed HIV/AIDS with spouse, children, and/or friends	81.1%	85.6%*	NS	81.1%	83.9%	82.0%	86.6%
Sex life improves with communication with partner (%Agree)	91.9%	93.9%	+	90.8%	91.7%	93.3%	95.5%

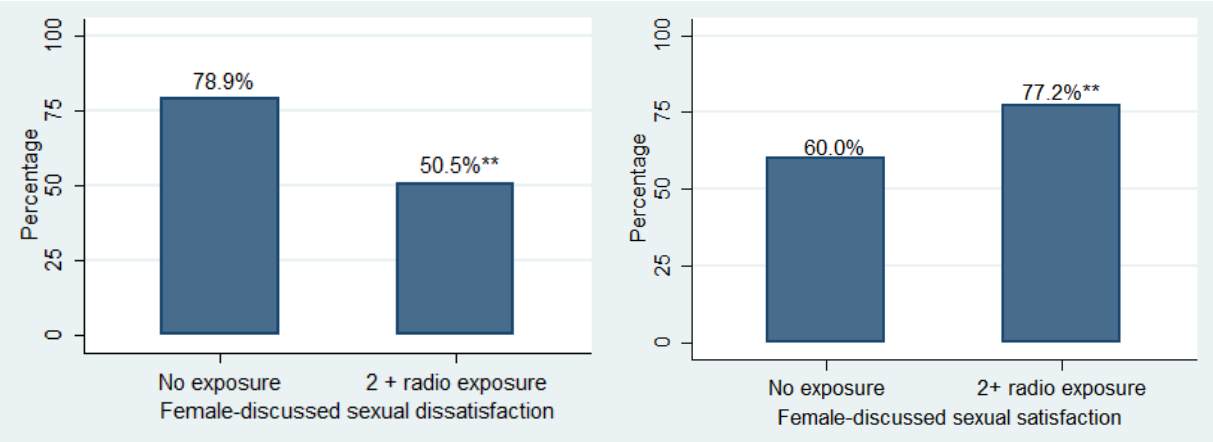
	Total			Males		Female	
	Unexposed	Exposed	PSM	Unexposed	Exposed	Unexposed	Exposed
Percentage who are dissatisfied when having sex with spouse/regular cohabitating partner	20.6%	26.0%	+	20.1%	23.8%	19.4%	27.5%
Percentage who have discussed sexual satisfaction with spouse/regular cohabitating partner	72.0%	81.7%*	+	90.5%	91.0%	60.0%	72.7%*
Exposure to Two+ Radio Shows (versus none)							
Discussed HIV/AIDS with friends	74.8%	79.0%	+	78.7%	84.8%	72.8%	74.1%
Discussed HIV/AIDS with spouse, children, and/or friends	81.1%	84.9%	+	81.1%	87.4%*	82.0%	82.8%
Percentage who are dissatisfied when having sex with spouse/regular cohabitating partner	20.6%	11.7%	-	20.1%	14.9%	19.4%	11.6%
Percentage who have discussed sexual dissatisfaction with spouse/regular cohabitating partner	63.6%	62.6%	NS	58.4%	55.6%*	78.9%	50.5%**
Percentage who are satisfied when having sex with spouse/regular cohabitating partner	88.6%	90.9%	NS	90.5%	96.9%*	87.4%	85.1%
Percentage who have discussed sexual satisfaction with spouse/regular cohabitating partner	72.0%	82.0%*	NS	90.5%	88.9%	60.0%	77.2%**

*=p<0.05 **=p<0.01

PSM: + significant/increasing ; - significant/decreasing ;NS not significant

Exposure to two or more radio programs appears to have a different effect on communication with sexual partners. For example, the PSM results indicate that exposed respondents report being sexually dissatisfied with their spouse or regular partner. Respondents who report that they are dissatisfied sexually are then asked if they have ever discussed this dissatisfaction with their partner. There are no significant differences in communicating this dissatisfaction among the total population, but the differences are significant and opposite of the desired direction when analyzed separately by sex. The largest difference is seen among women, among whom only half of those in the exposed group report discussing sexual dissatisfaction as compared with 78.9% of the unexposed group. The difference among men is almost 3 percentage points. However, this is reversed when it comes to discussing sexual satisfaction with their partners; women exposed to two or more radio programs are more likely (17 percentage point difference) to have discussed sexual satisfaction (Figure 9).

Figure 9: Exposure to radio and discussion with sexual partners among women



This effect is also observed in the total population (82.0% versus 72.0%). While not significant for the total population or among women, 96.9% of men exposed to two or more radio programs report being sexually satisfied as compared with 90.5% of unexposed men. No significant differences are found when examining the effect of television exposure on HIV communication outcomes, the full results can be found in Appendix E.

Exposure to one booklet has significant effects on five communication outcomes although none of these are significant for the total population (Table 19). There is a significant treatment effect of being exposed to one booklet on discussion of HIV/AIDS among women only. For example, 86.7% of women exposed to one booklet report discussing HIV/AIDS with friends as compared with 69.6% of unexposed women. Exposed men are more likely to agree (4 percentage point difference) that one's sex life can improve with communication with one's partner. A lower percentage of exposed men report being dissatisfied with their sexual partner and among those who are dissatisfied, fewer of them report discussing this dissatisfaction with their partner than unexposed men who also report sexual dissatisfaction (37.4% versus 68.2%).

Table 19: Summary of multivariate results for print exposure and HIV communication

	Total			Males		Female	
	Unexposed	Exposed	PSM	Unexposed	Exposed	Unexposed	Exposed
Exposure to One Booklet (versus none)							
Discussed HIV/AIDS with friends	74.7%	81.2%	NS	80.5%	73.6%	69.6%	86.7%**
Discussed HIV/AIDS with spouse, children, and/or friends	81.5%	85.8%	NS	83.3%	76.6%	79.8%	92.8%**
Sex life improves with communication with partner (%Agree)	92.3%	94.9%	NS	90.4%	94.3%*	94.4%	95.4%

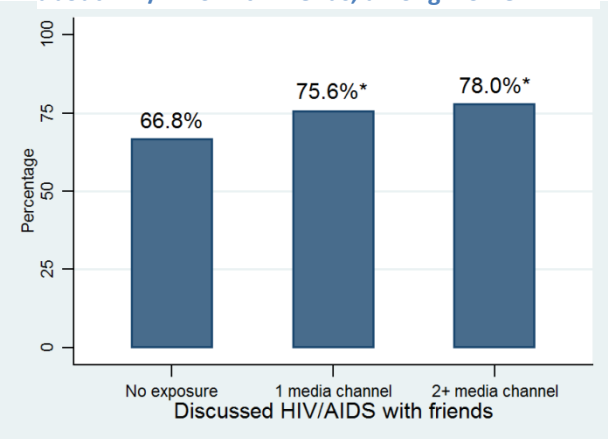
	Total			Males		Female	
	Unexposed	Exposed	PSM	Unexposed	Exposed	Unexposed	Exposed
Percentage who are dissatisfied when having sex with spouse/regular cohabitating partner	21.5%	15.0%	NS	26.6%	6.9%**	18.0%	18.4%
Percentage who have discussed sexual dissatisfaction with spouse/regular cohabitating partner	65.0%	39.9%**	NS	68.2%	37.4%**	67.7%	52.6%
Exposure to Two or More Booklets (versus none)							
Discussed HIV/AIDS with children	51.4%	59.9%	+	40.7%	53.9%	57.5%	60.1%
Discussed HIV/AIDS with friends	74.7%	81.2%*	+	80.5%	85.3%	69.6%	77.7%
Discussed HIV/AIDS with spouse, children, and/or friends	81.5%	86.1%	+	83.3%	88.3%	79.8%	84.9%
Percentage who are dissatisfied when having sex with spouse/regular cohabitating partner	21.5%	18.6%	NS	26.6%	15.2%*	18.0%	24.5%

*=p<0.05 **=p<0.01

PSM: + significant/increasing ; - significant/decreasing ;NS not significant

As with other program exposure measures, there is a positive treatment effect of exposure to two or more booklets on increased discussion about HIV/AIDS among the total population. The difference between the exposed and unexposed groups regarding discussion of HIV/AIDS with their children is 8.5 percentage points (significant in PSM analysis only) and 6.5 percentage points for discussion with friends (significant in both analyses). Further, 15.2% of men exposed to two or more booklets report being dissatisfied when having sex with their regular partner as compared with 26.6% of unexposed men. However, there are no significant differences in the percentage who report discussing this dissatisfaction (not shown).

Figure 10: Exposure to multimedia and discussion about HIV/AIDS with friends, among women



Exposure to Lusweti/OneLove interventions through more than one media channel is found to have a significant effect on increased discussion about HIV/AIDS with friends (Table 20). This is true among women exposed at both levels; 75.6% of women exposed to one media channel and 78.0% of women exposed to two or more media channels report discussing HIV/AIDS with friends as compared with 66.8% of unexposed women (Figure 10).

For the total population, exposure to two or more media channels is significant in the PSM results for increased discussion about HIV. Consistent with the results from other exposure measures, women exposed to two or more media channels are less likely to discuss sexual dissatisfaction with their regular partners (56.0% versus 75.7%).

Table 20: Summary of multivariate results for multimedia exposure and HIV communication

	Total			Males		Female	
	Unexposed	Exposed	PSM	Unexposed	Exposed	Unexposed	Exposed
Exposure to One Media Channel (versus none)							
Discussed HIV/AIDS with friends	74.1%	78.4%	NS	82.0%	82.5%	66.8%	75.6%*
Sex life improves with communication with partner (%Agree)	89.6%	94.5%**	+	89.0%	93.5%*	91.7%	95.1%
Percentage who have discussed sexual dissatisfaction with spouse/regular cohabitating partner	71.8%	62.0%	NS	55.9%	67.3%	86.7%	68.7%**
Exposure to Two or More Media Channels (versus none)							
Discussed HIV/AIDS with friends	74.1%	79.2%	+	82.0%	79.3%	66.8%	78.0%*
Discussed HIV/AIDS with spouse, children, and/or friends	81.3%	84.7%	+	83.4%	83.1%	79.5%	85.5%
Percentage who have discussed sexual dissatisfaction with spouse/regular cohabitating partner	71.8%	68.2%	NS	55.9%	61.4%	86.7%	60.0%**

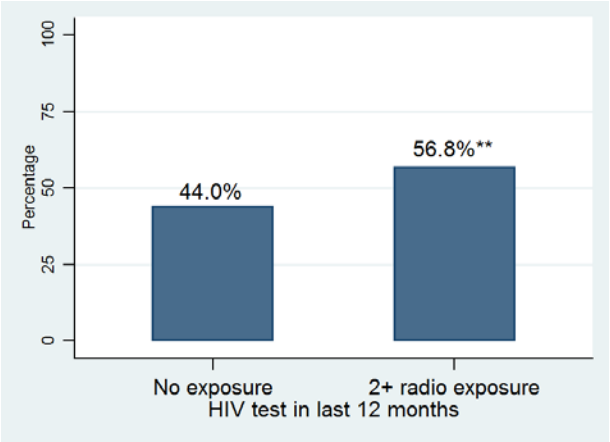
*=p<0.05 **=p<0.01

PSM: + significant/increasing ; - significant/decreasing ;NS not significant

4.3.4 HIV TESTING

For the combined male and female populations, those exposed to one radio show are more likely than the unexposed to agree that the only way to know one's HIV status is through a blood test (1.5 percentage point difference) and to agree that leaders encourage HIV testing (7 percentage point difference). Similarly, those exposed to two or more radio shows are more likely to have been tested for HIV in the past year (56.8% versus 44.0%, Figure 11), to agree that the only way to know one's HIV status is through a blood test (99.0% versus 97.2%), and to agree that leaders encourage HIV testing (74.1% versus 59.5%) as compared with individuals not exposed to any radio shows.

Figure 11: Exposure to two or more radio programs and HIV testing in the last 12 months, total population



There are clear differences by gender in the relationship between exposure to radio shows and HIV testing behaviors. For men, several HIV testing variables differ significantly between exposed and unexposed populations. Men exposed to one radio show are less likely to receive the results of their most recent HIV test (-4 percentage point difference); are more likely than unexposed men to have discussed results of their most recent test, and more likely to agree that the only way to know one's HIV status is through a blood test. Men exposed to two or more radio shows had similar results. They are more likely than unexposed men to agree that the only way to know HIV status is through a blood test, and are more likely to agree that leaders encourage HIV testing. In contrast, for women none of the HIV testing variables differ significantly between populations exposed and unexposed to radio shows - for either level of exposure one radio show or two or more radio shows, compared to no exposure to radio shows.

Table 21: Summary of multivariate results for radio exposure and HIV testing

	Total			Males		Female	
	Unexposed	Exposed	PSM	Unexposed	Exposed	Unexposed	Exposed
Exposure to One Radio Show (versus none)							
Ever tested for HIV	64.6%	65.3%	NS	53.7%	50.5%	74.2%	79.4%
HIV test in the last 12 months	44.0%	49.9%	NS	38.8%	39.4%	49.3%	59.1%
Received results of most recent HIV test	97.4%	96.5%	NS	97.8%	93.1%**	97.3%	98.0%
Discussed results of most recent HIV test	81.8%	85.7%	NS	79.1%	90.3%*	83.9%	82.9%
Only way to know status is by blood test (%Agree)	97.2%	98.8%*	+	95.0%	98.4%*	98.3%	99.2%
Leaders encourage HIV testing (%Strongly agree/agree)	59.5%	66.7%*	NS	61.1%	68.9%	60.4%	64.3%
Exposure to Two+ Radio Shows (versus none)							
Ever tested for HIV	64.6%	69.5%	+	53.7%	53.0%	74.2%	79.4%
HIV test in the last 12 months	44.0%	56.8%**	+	38.8%	43.9%	49.3%	59.1%
Only way to know status is by blood test (%Agree)	97.2%	99.0%**	NS	95.0%	99.5%**	98.3%	99.2%
Leaders encourage HIV testing (%Strongly agree/agree)	59.5%	74.1%**	+	61.1%	78.7%**	60.4%	64.3%
Number of times tested for HIV	2.1	2.4	+	1.4	1.8	2.6	2.9

*=p<0.05 **=p<0.01

PSM: + significant/increasing ; - significant/decreasing ;NS not significant

For the total population, several variables show significant differences between those exposed and unexposed to television in HIV testing-related behaviors (Table 22). Those exposed are more likely to have ever been tested for HIV (70.1% versus 63.5%), to have been tested in the past 12 months (55.1% versus 46.7%, also significant in PSM), and to agree that it is important to know one's HIV status (98.9% versus 96.6%). The one negative finding observed is that a lower percentage of respondents exposed to television agree that leaders encourage people to get tested for HIV (61.2% versus 70.1%).

Both men and women exposed to television programs are more likely to agree that it is important to know one's HIV status. In other cases, the variables are significant for only men or only women. For example, only exposed men are more likely to have been ever-tested for HIV (20 percentage point difference), or to have been tested in the past 12 months (9 percentage point difference); and only exposed women are more likely to agree that leaders encourage HIV testing. Some variables are significant in opposite directions between men and women (and are not significant in the combined models): exposed men are tested more times on average than unexposed men, but exposed women are tested significantly fewer times than unexposed women. Similarly, men exposed to television programming are more likely to agree that pregnant women should test for HIV, while exposed women are less likely than unexposed women to agree that pregnant women should be tested. While exposed men have a higher average number of HIV tests (1.9 versus 1.2), exposed women have a lower average number of lifetime HIV tests (2.5 versus 3.0).

Table 22: Summary of multivariate results for television exposure and HIV testing

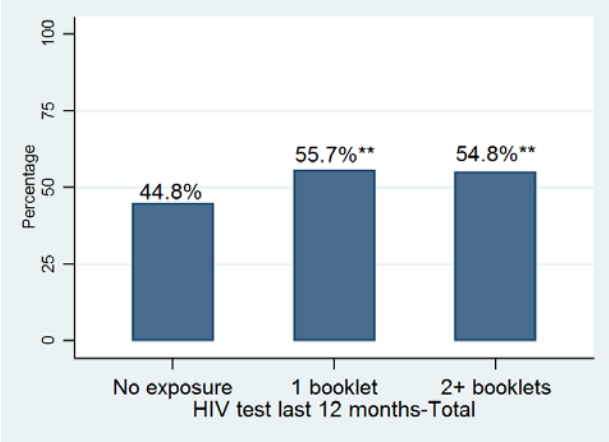
	Total			Males		Female	
	Unexposed	Exposed	PSM	Unexposed	Exposed	Unexposed	Exposed
Exposed to Any Television (versus none)							
Ever tested for HIV	63.5%	70.1%*	+	44.2%	64.6%**	81.4%	75.2%
HIV test in the last 12 months	46.7%	55.1%*	+	34.2%	49.8%**	59.0%	58.5%
Discussed results of most recent HIV test	80.7%	83.0%	NS	86.3%	80.7%	78.0%	84.7%*
Pregnant woman should test for HIV (%True)	95.1%	94.5%	NS	91.8%	95.6%*	97.8%	94.4%*
It is important to know your HIV status (%Agree)	96.6%	98.9%**	NS	97.0%	98.8%*	96.0%	98.9%**
Leaders encourage HIV testing (%Strongly agree/agree)	70.1%	61.2%**	NS	70.3%	66.3%	69.4%	57.7%**
Number of times tested for HIV	2.1	2.3	NS	1.2	1.9**	3.0	2.5**

*=p<0.05 **=p<0.01

PSM: + significant/increasing ; - significant/decreasing ;NS not significant

Exposure to one booklet is not found to have a significant effect on having ever been tested for HIV. However, both the multivariate and PSM results indicate that there is significant effect for testing in the last 12 months among the total population. In fact, being exposed to one or two or more booklets is significantly associated with being tested for HIV in the last 12 months (Figure 12). In this case, the largest effect is seen with exposure to one booklet (13 percentage point difference) although both levels of exposure are significant when compared with the unexposed group. It is also observed that people exposed to two or more booklets are more likely to agree that leaders encourage HIV testing (5 percentage point difference).

Figure 12: Exposure to print materials and HIV testing in the last 12 months, total population



Differences between men and women are evident in the relationship between exposure to booklets and HIV testing behaviors. While no outcomes for women are significantly different between those exposed and unexposed to booklets, several outcomes are significantly different for men - but only for men exposed to two or more booklets. Specifically, men who are exposed to two or more booklets are more likely than the unexposed to have ever been tested for HIV (60.0% versus 46.4%), to have been tested in the past year (50.6% versus 32.8%), to agree that leaders encourage HIV testing (74.6% versus 64.0%), and to have been tested a greater number of times on average (1.9 versus 1.2).

Table 23: Summary of multivariate results for print exposure and HIV testing

	Total			Males		Female	
	Unexposed	Exposed	PSM	Unexposed	Exposed	Unexposed	Exposed
Exposure to One Booklet (versus none)							
Ever tested for HIV	64.2%	70.5%	NS	46.4%	53.3%	79.6%	85.5%
HIV test in the last 12 months	44.8%	55.7%**	+	32.8%	41.6%	55.9%	68.5%
Exposure to Two or More Booklets (versus none)							
Ever tested for HIV	64.2%	67.0%	NS	46.4%	60.0%**	79.6%	74.3%
HIV test in the last 12 months	44.8%	54.8%**	+	32.8%	50.6%**	55.9%	57.6%
Discussed results of most recent HIV test	81.1%	84.8%	+	80.3%	85.6%	81.2%	84.9%
Leaders encourage HIV testing (%Strongly agree/agree)	64.2%	69.5%*	+	64.0%	74.6%**	65.0%	65.1%
Number of times tested for HIV	2.1	2.2	+	1.2	1.9**	2.9	2.5

*=p<0.05 **=p<0.01

PSM: + significant/increasing ; - significant/decreasing ;NS not significant

For the total population (men and women combined), the same two variables are significantly different between exposed and unexposed populations for both exposure measures (one or two or more media channels); the exposed populations are significantly more likely to have been ever-tested for HIV, and are more likely to have been tested for HIV in the past 12 months (Figure 13).

Differences between men and women are evident in the relationship between the level of media exposure and HIV testing behaviors (Table 24). For men, only two variables are significantly different between those exposed to one media channel and the unexposed; exposed men are more likely to have been ever-tested and tested in the past year (as above). However, these and several other variables are significantly different between men exposed to two or more channels as compared with the unexposed. In addition to the two testing variables above, exposed men are less likely to have received their HIV test results, are more likely to agree that leaders encourage HIV testing, and to have been tested a larger number of times overall. For women, more variables are significantly different between those exposed to one channel than women exposed to two or more (compared to the unexposed). Women exposed to one channel are more likely to have been ever tested, to have received test results, and to agree that pregnant women should be tested for HIV. Women exposed to two or more channels are more likely to have been tested in the past year, and to agree that pregnant women should be tested for HIV.

Table 24: Summary of multivariate results for multimedia exposure and HIV testing

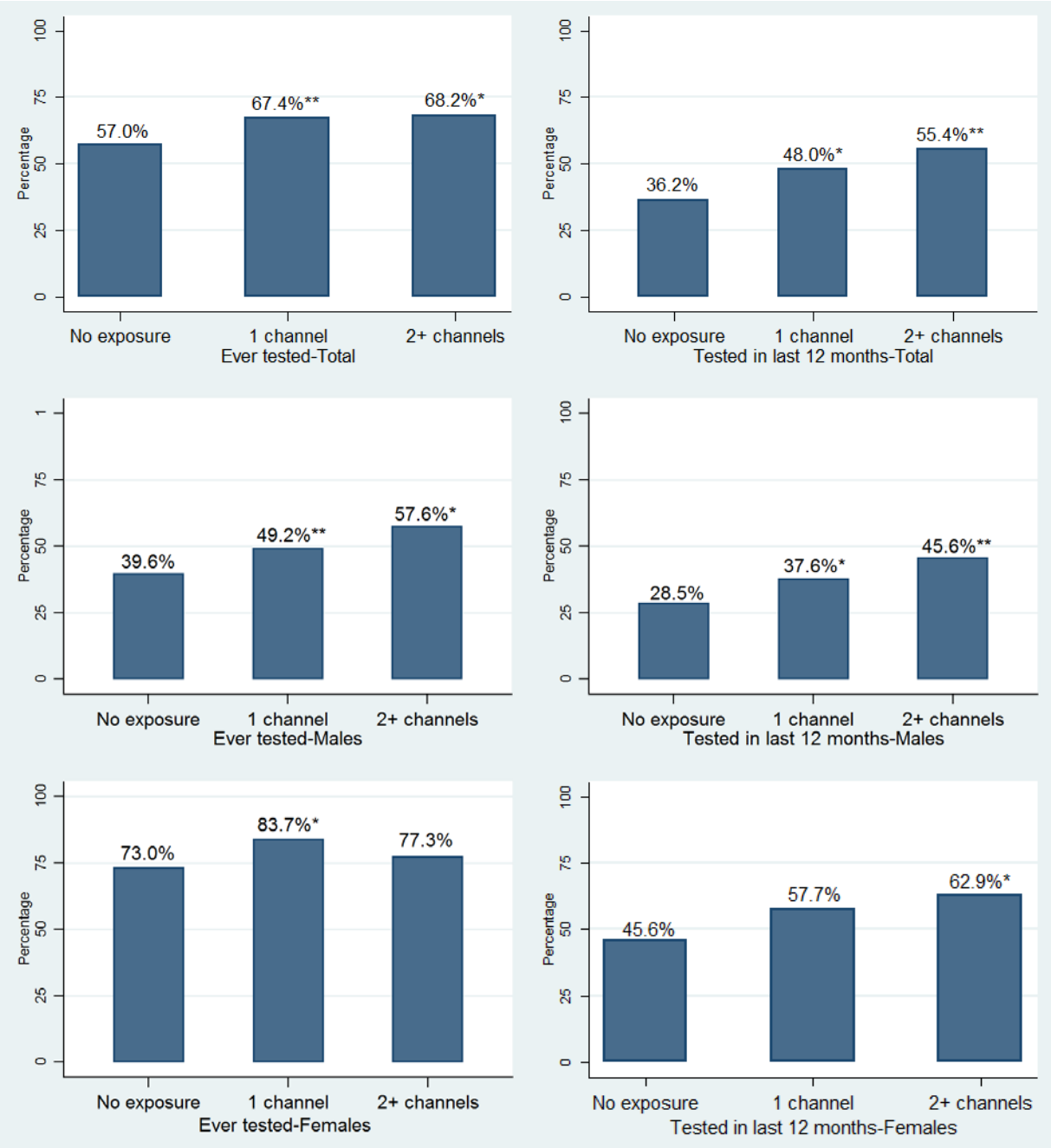
	Total			Males		Female	
	Unexposed	Exposed	PSM	Unexposed	Exposed	Unexposed	Exposed
Exposure to One Media Channel (versus none)							
Ever tested for HIV	57.0%	67.4%**	NS	39.6%	49.2%*	73.0%	83.7%*
HIV test in the last 12 months	36.2%	48.0%*	NS	28.5%	37.6%*	45.6%	57.7%
Received results of most recent HIV test	97.2%	97.8%	NS	98.2%	96.6%	95.7%	98.4%*
Pregnant woman should test for HIV (%True)	93.5%	95.7%	NS	92.4%	94.3%	92.9%	97.1%*
Only way to know status is by blood test (%Agree)	97.8%	98.7%	+	96.8%	98.5%	98.1%	98.7%
Exposure to Two or More Media Channels (versus none)							
Ever tested for HIV	57.0%	68.2%*	+	39.6%	57.6%**	73.0%	77.3%
HIV test in the last 12 months	36.2%	55.4%**	+	28.5%	45.6%**	45.6%	62.9%*
Received results of most recent HIV test	97.2%	97.2%	NS	98.2%	95.1%*	95.7%	98.3%
Pregnant woman should test for HIV (%True)	93.5%	94.7%	NS	92.4%	92.9%	92.9%	96.3%*
Leaders encourage HIV testing (%Strongly agree/agree)	63.9%	68.2%	+	60.1%	72.8%**	69.0%	63.7%
Number of times tested for HIV	2.0	2.2	+	1.1	1.7**	17.9	18.2

*=p<0.05 **=p<0.01

PSM: + significant/increasing ; - significant/decreasing ;NS not significant

Similar to the results for men, the PSM analysis showed more significant differences for those exposed to two or more channels than those exposed to one channel (compared to the unexposed). While only one variable is significantly different for exposure to one channel (the exposed are more likely to agree that blood test is the only way to know one's HIV status), four are significantly different between those exposed to two or more channels compared to the unexposed: the exposed are more likely to have been ever-tested and tested in the past year, are tested more times overall, and are more likely to agree that leaders encourage HIV testing.

Figure 13:Multi-channel exposure and HIV testing behaviors



4.3.5 HIV TREATMENT

Results show clear differences between exposure to one and two or more radio shows on HIV treatment outcomes (Table 25). Several HIV treatment variables are significantly different between individuals exposed to one radio show and those unexposed to a radio show. For the total population, those exposed to one radio show are relatively more likely to know that ARVs prevent MCT during pregnancy (6 percentage point difference), childbirth (8 percentage point difference), and breastfeeding (6 percentage point difference). Both men and women exposed to one radio show are more likely to be willing to care for someone on ART (8 and 5 percentage point differences, respectively).

There is a significant effect of radio exposure at both levels on the willingness of people to care for someone on ART. As seen in Figure 14, people exposed to one radio show are more willing to care for someone on ART (92.9% versus 86.3%); the difference between those exposed to two or more programs is also significant although slightly lower.

Figure 14: Exposure to radio and willingness to care for someone on ART, total population

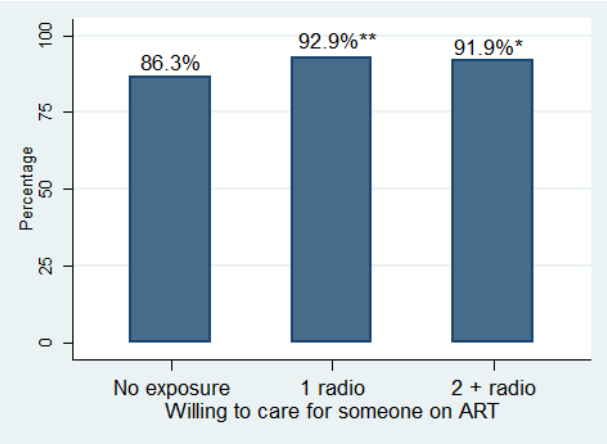


Table 25: Summary of multivariate results for radio exposure and HIV treatment

	Total			Males		Female	
	Unexposed	Exposed	PSM	Unexposed	Exposed	Unexposed	Exposed
Exposure to One Radio Show (versus none)							
Willing to care for someone on ART	86.3%	92.9%**	+	80.3%	88.8%**	91.4%	96.3%**
PLHIV on ART can transmit HIV (%True)	90.3%	90.7%	+	93.6%	91.7%	87.6%	89.4%
ARVs prevent MCT during pregnancy	73.7%	79.9%*	+	63.5%	70.4%	82.5%	88.7%*
ARVs prevent MCT during childbirth	68.8%	76.3%**	NS	60.1%	64.0%	76.7%	86.9%**
ARVs prevent MCT during breastfeeding	67.6%	73.4%*	NS	59.4%	59.8%	75.5%	85.0%**
Exposure to Two+ Radio Shows (versus none)							
Cared for someone on ART	17.8%	21.3%	NS	13.0%	18.5%*	21.7%	23.7%
Willing to care for someone on ART	86.3%	91.9%*	+	80.3%	90.0%*	91.4%	93.9%
PLHIV does not need to use condoms because cannot transmit HIV (% False)	93.0%	95.8%*	+	93.5%	95.5%	92.7%	96.1%

	Total			Males		Female	
	Unexposed	Exposed	PSM	Unexposed	Exposed	Unexposed	Exposed
ARVs prevent MCT during childbirth	68.8%	75.5%*	NS	60.1%	56.9%	76.7%	89.8%**
ARVs prevent MCT during breastfeeding	67.6%	70.4%	NS	59.4%	53.1%	75.5%	84.0%*
Leaders encourage HIV treatment (%Strongly agree/agree)	61.4%	77.1%**	+	63.8%	80.3%**	61.3%	72.8%**
Participated in a PMTCT program	24.5%	29.5%	+			24.5%	29.5%

*=p<0.05 **=p<0.01

PSM: + significant/increasing ; - significant/decreasing ;NS not significant

Results for men and women combined (the total population) show differences between those exposed to any television show and the unexposed for several HIV treatment-related variables but not always in the desired direction (Table 26). For example, those exposed to any TV show are less likely to believe that PLHIV on ART can transmit HIV (87.6% versus 91.5%), that people on ART have to stay on treatment for the rest of their lives (90.9% versus 93.7%), and that leaders encourage HIV treatment (65.1% versus 69.9%). Exposed individuals are more likely to believe that ARVs prevent MCT during childbirth (75.5% versus 72.1%). Men exposed to any television are more likely to believe that ARVs prevent MCT during pregnancy (almost a 10 percentage point difference) and childbirth (9 percentage point difference), but are less likely to believe that people on ART have to stay on treatment for the rest of their lives (- 5 percentage point difference. Women exposed to television are less likely to believe that PLHIV on ART can transmit HIV (84.1% versus 90.3%), and are less likely to have participated in a PMTCT program. No variables are significantly different between exposed and unexposed populations in the PSM analysis.

Table 26: Summary of multivariate results for television exposure and HIV treatment

	Total			Males		Female	
	Unexposed	Exposed	PSM	Unexposed	Exposed	Unexposed	Exposed
Exposed to Any Television (versus none)							
PLHIV on ART can transmit HIV (%True)	91.5%	87.6%*	NS	93.2%	90.8%	90.3%	84.1%*
ARVs prevent MCT during pregnancy	74.8%	81.1%	NS	62.8%	72.6%*	85.7%	88.0%
ARVs prevent MCT during childbirth	72.1%	75.5%*	NS	57.0%	66.1%*	85.6%	83.4%
People on ART have to stay on treatment for rest of lives	93.7%	90.9%*	NS	93.4%	88.5%**	93.7%	93.0%
Leaders encourage HIV treatment (%Strongly agree/agree)	69.9%	65.1%*	NS	69.6%	70.3%	69.7%	61.3%
Participated in a PMTCT program	30.0%	18.4%*	NS			30.0%	18.4%*

*=p<0.05 **=p<0.01

	Total			Males		Female	
	Unexposed	Exposed	PSM	Unexposed	Exposed	Unexposed	Exposed
PSM: + significant/increasing ; - significant/decreasing ;NS not significant							

Results for the relationship between exposure to booklets and HIV treatment variables show differences by the level of exposure. While several variables are significantly different between those exposed to one booklet compared to the unexposed, there is less evidence of an effect of two or more booklets (Table 27). The total population exposed to one booklet is less likely to know that PLHIV on ART can transmit HIV (86.8% versus 92.0%), and are more likely to know that ARVs prevent MCT during pregnancy (85.1% versus 74.3%), childbirth (81.9% versus 71.4%), or breastfeeding (78.9% versus 66.7%). These results for PMTCT and ARV knowledge are also observed when the analysis is conducted separately for men and women. People exposed to one booklet are more likely to know that people on ART have to stay on treatment for the rest of their lives (95.0% versus 91.7%) and are more likely to know the statement *PLHIV on ART do not need to use condoms because they cannot transmit HIV* is false (95.7% versus 92.9%).

Table 27: Summary of multivariate results for print exposure and HIV treatment

	Total			Males		Female	
	Unexposed	Exposed	PSM	Unexposed	Exposed	Unexposed	Exposed
Exposure to One Booklet (versus none)							
PLHIV on ART can transmit HIV (%True)	92.0%	86.8%**	NS	93.9%	90.2%	90.1%	84.5%
PLHIV does not need to use condoms because cannot transmit HIV (% False)	92.9%	95.7%*	+	93.9%	96.6%	91.8%	94.9%
ARVs prevent MCT during pregnancy	74.3%	85.1%**	+	61.7%	74.7%**	85.1%	94.1%**
ARVs prevent MCT during childbirth	71.4%	81.9%**	+	55.7%	69.2%**	84.8%	93.0%**
ARVs prevent MCT during breastfeeding	66.7%	78.9%**	+	53.8%	66.6%*	78.0%	89.8%*
People on ART have to stay on treatment for rest of lives	91.7%	95.0%*	NS	91.9%	92.9%	91.5%	96.6%*
Received support from an ARV treatment buddy or CBV, if taken ARVs	44.4%	60.1%	+			41.1%	62.6%
Participated in a PMTCT program	25.6%	26.1%	+			25.6%	26.1%
Exposure to Two or More Booklets (versus none)							
Willing to care for someone on ART	89.7%	91.0%	+	83.3%	90.1%*	94.9%	92.8%
PLHIV on ART can transmit HIV (%True)	92.0%	88.8%*	NS	93.9%	91.0%	90.1%	86.8%
ARVs prevent MCT during pregnancy	74.3%	77.3%	+	61.7%	69.6%	85.1%	84.6%

	Total			Males		Female	
	Unexposed	Exposed	PSM	Unexposed	Exposed	Unexposed	Exposed
ARVs prevent MCT during childbirth	71.4%	72.2%	+	55.7%	63.2%	84.8%	80.6%
ARVs prevent MCT during breastfeeding	66.7%	71.8%	+	53.8%	58.7%	78.0%	82.7%
Leaders encourage HIV treatment (%Strongly agree/agree)	65.7%	70.9%	+	65.8%	75.3%*	66.1%	66.8%

*=p<0.05 **=p<0.01

PSM: + significant/increasing ; - significant/decreasing ;NS not significant

Results for exposure to two or more booklets showed fewer significant differences with the unexposed population in the probit regression results: they are less likely to know that PLHIV on ART can transmit HIV, and men exposed to two or more booklets are more likely to believe that leaders encourage HIV treatment (75.3% versus 65.8%) and are willing to care for someone on ART (90.1% versus 83.3%). No significant differences are evident for women exposed to two or more booklets as compared with women not exposed to booklets.

For the total population, only one variable is significantly different between individuals exposed to one media channel and those unexposed to any media channels: those exposed to one media channel are more likely to be willing to care for someone on ART (Table 28). However, several variables are significant for those exposed to two media channels, including willingness to care for someone on ART, and the effectiveness of ARVs in preventing MCT during pregnancy (81.8% versus 71.5%), childbirth (76.6% versus 69.0%) and breastfeeding (74.2% versus 65.6%) - all of which are higher among those exposed. By sex, women exposed to one channel are more willing to care for someone on ART, and women exposed to two channels are more likely to agree that ARVs prevent MCT during breastfeeding. No variables are significantly different for men exposed to one channel, but men exposed to two channels are more likely than unexposed men to be willing to care for someone on ARVs, to agree that ARVs prevent MCT during pregnancy, and to agree that leaders encourage HIV treatment.

Table 28: Summary of multivariate results for multimedia exposure and HIV treatment

	Total			Males		Female	
	Unexposed	Exposed	PSM	Unexposed	Exposed	Unexposed	Exposed
Exposure to One Media Channel (versus none)							
Willing to care for someone on ART	85.1%	92.3%**	NS	79.7%	85.3%	90.6%	97.4%**
ARVs prevent MCT during pregnancy	71.5%	72.2%	-	58.4%	59.0%	83.5%	82.9%

Exposure to Two or More Media Channels (versus none)							
Willing to care for someone on ART	85.1%	90.8%*	+	79.7%	89.1%*	90.6%	92.9%
ARVs prevent MCT during pregnancy	71.5%	81.8%**	+	58.4%	73.3%*	83.5%	89.5%
ARVs prevent MCT during childbirth	69.0%	76.6%*	+	54.9%	65.1%	81.8%	86.8%
ARVs prevent MCT during breastfeeding	65.6%	74.2%*	+	54.7%	61.1%	76.1%	85.2%*
People on ART have to stay on treatment for rest of lives	93.0%	93.6%	+	93.1%	92.1%	93.3%	94.5%
Leaders encourage HIV treatment (%Strongly agree/agree)	65.4%	70.8%	+	61.9%	74.8%**	70.4%	66.7%
*=p<0.05 **=p<0.01							
PSM: + significant/increasing ; - significant/decreasing ;NS not significant							

4.3.6 HIV STIGMA

The results of the analyses of the effect of exposure to OneLove radio shows on stigma indicators are shown in Table 29. Respondents exposed to one OneLove radio show are slightly more likely than unexposed respondents to disagree with the statement that your life is over when you learn that you are HIV positive (95.6% versus 93.5%); however, this effect is not significant in the PSM analysis. The probit regression results show that exposure to one radio does not affect the other stigma indicators. Exposure to two or more OneLove radio shows is associated with an increase in the percentage of people who disagree that only promiscuous people get HIV (83.5% versus 76.5%), an effect that is confirmed by the PSM analysis.

Table 29: Summary of multivariate results for radio exposure and stigma

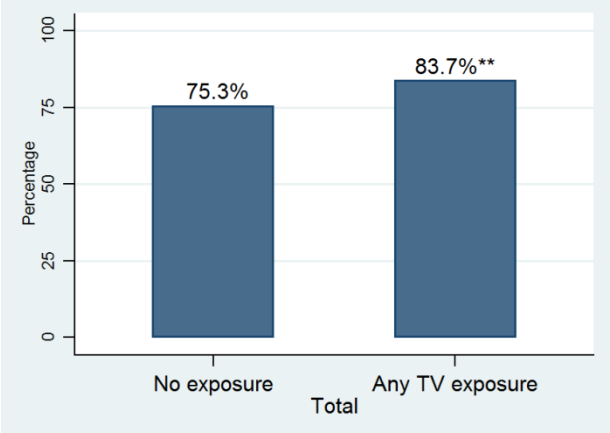
	Total			Males		Female	
	Unexposed	Exposed	PSM	Unexposed	Exposed	Unexposed	Exposed
Exposure to One Radio Show (versus none)							
When learn that you are HIV+, life is over (%Disagree)	93.5%	95.6%*	NS	95.3%	95.3%	91.6%	95.7%**
Telling people you are HIV+ doesn't help (%Disagree)	61.0%	67.8%	+	59.9%	71.4%*	61.0%	65.3%
HIV is punishment for sinning (%Disagree)	82.4%	79.6%	NS	84.2%	76.6%**	79.3%	83.3%
People in the community join together to help PLHIV (%Strongly agree/agree)	57.2%	62.1%	+	58.5%	63.2%	58.6%	60.1%
Exposure to Two+ Radio Shows (versus none)							
When learn that you are HIV+, life is over (%Disagree)	93.5%	94.0%	NS	95.3%	92.1%*	91.6%	95.1%
Only promiscuous people get HIV (%Disagree)	76.5%	83.5%*	+	71.1%	85.0%**	79.6%	83.4%
*=p<0.05 **=p<0.01 ; PSM: + significant/increasing ; - significant/decreasing ;NS not significant							

Disaggregation by gender shows that there are important treatment effects of radio exposure on stigma among females. Among females, exposure to one radio show is associated with a higher percentage of women disagreeing that when you learn that you are HIV positive, your life is over (95.7% versus 91.6%). There is no effect of exposure to two or more radio shows has no effect on this indicator.

Among males, a positive treatment effect of exposure to one radio program is observed on the percentage of men disagreeing that disclosing your HIV status does not help (71.4% versus 59.9%). However, low exposure to OneLove radio program is negatively associated with disagreeing with the statement that HIV is a punishment for sinning (76.6% versus 84.2%). Being exposed to at least two radio programs is associated with a lesser likelihood of disagreeing that your life is over when you learn that you are HIV positive (92.1% versus 95.3%), and a greater likelihood of disagreeing that only promiscuous people get HIV (85.0% versus 71.1%).

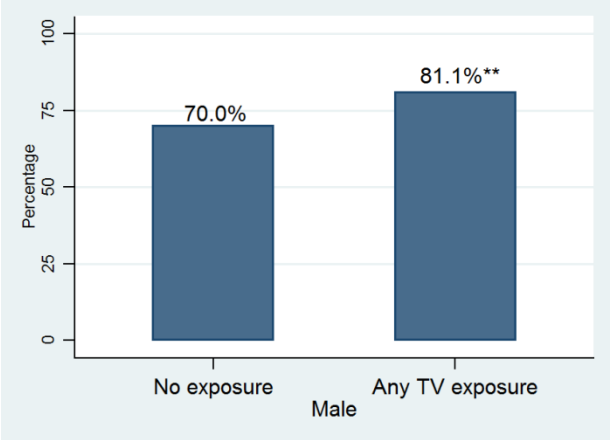
The effects of exposure to any OneLove television programs on the stigma indicators are shown in Table 30. The results for the total population reveal several treatment effects of TV exposure on the stigma indicators, although several are not in the expected direction. Exposure to any OneLove TV programs has a positive effect on disagreement with the statement that only promiscuous people get HIV (83.7% versus 75.3%, Figure 15). However, respondents who are exposed to any OneLove television program are less likely to disagree that disclosing your HIV status does not help (58.3% versus 69.0%), are more likely to believe that people in their community would want to keep it a secret if a family member was HIV positive (78.8% versus 70.0%), and are less likely to believe that people in their community are joining together to help people with HIV (56.6% versus 63.9%).

Figure 15: Exposure to television and disagreement that only promiscuous people get HIV, total population



Among males, there is a positive treatment effect of TV exposure on the percentage of men who disagree that only promiscuous people get HIV (81.1% versus 70.0%, Figure 16). Males who are exposed to TV are also slightly less likely to disagree with the statement that your life is over when you learn that you are HIV positive (92.6% versus 95.3%).

Figure 16: Exposure to television and disagreement that only promiscuous people get HIV, males



The results for women also show a positive treatment effect of TV exposure on the disagreement with the statement that only promiscuous people get HIV (85.6% versus 78.8%, Figure 17). However, exposed women are more likely to believe that people in their community would want to keep it a secret if a family member was HIV positive (76.2% versus 63.3%). Women who are exposed to television programs are also substantially less likely than unexposed women to disagree that disclosing your HIV status does not help (56.4% versus 68.9%).

Figure 17: Exposure to television and disagreement that only promiscuous people get HIV, females

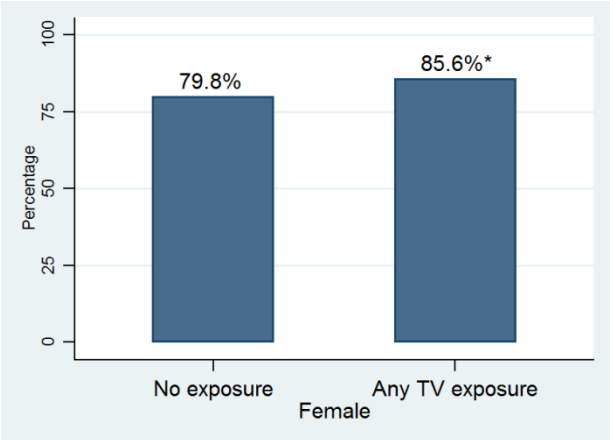


Table 30: Summary of multivariate results for television exposure and stigma

	Total			Males		Female	
	Unexposed	Exposed	PSM	Unexposed	Exposed	Unexposed	Exposed
Exposed to Any Television (versus none)							
When learn that you are HIV+, life is over (%Disagree)	94.2%	94.7%	NS	95.3%	92.6%*	92.3%	96.1%
Telling people you are HIV+ doesn't help (%Disagree)	69.0%	58.3%**	NS	68.2%	62.2%	68.9%	56.4%**
Only promiscuous people get HIV (%Disagree)	75.3%	83.7%**	+	70.0%	81.1%**	79.8%	85.6%*
People in community would want to keep secret if family member has HIV (%Strongly agree/agree)	70.0%	78.8%**	+	76.6%	82.8%	63.3%	76.2%**
People in the community join together to help PLHIV (%Strongly agree/agree)	63.9%	56.6%**	NS	64.1%	59.9%	62.3%	55.8%

*=p<0.05 **=p<0.01

PSM: + significant/increasing ; - significant/decreasing ;NS not significant

Table 31 shows the effects of exposure to OneLove booklets on indicators of HIV stigma. For the total population, respondents who have read one of the booklets are less likely than unexposed respondents to disagree that disclosing your HIV status is not helpful (54.6% versus 69.3%). High exposure to booklets is associated with lesser likelihood of disagreeing that disclosing HIV status does not help (63.1% versus 69.1%). However, neither of these effects is significant in the PSM analyses. Respondents who have read two or more booklets are also more likely to believe that people in their community would like to keep it a secret if a family member was HIV positive (78.2% versus 72.4%). On the positive side, high exposure to booklets is positively associated with agreement with the statement that people in the respondent's community are joining together to help people living with HIV/AIDS (65.7% versus 58.0%). This effect is confirmed by the PSM analyses.

Among males, there is no effect of low exposure to booklets on any of the stigma indicators. High exposure to booklets is associated with a lower likelihood of disagreeing with the statement that disclosing your HIV status is not helpful (59.7% versus 69.2%), and a higher likelihood of agreeing that people in the respondent's community would want to keep it a secret if one of their family members was HIV positive (85.8% versus 78.1%). As was the case for the total population, men with high booklet exposure are more likely than unexposed men to believe that people in their community are joining together to help people who are HIV positive or who have AIDS (69.5% versus 56.7%).

Among women, exposure to booklets has little or no effect on the stigma indicators. In fact, the only significant effect is not in the desired direction. Specifically, women exposed to one booklet are less

likely than unexposed women to disagree that it is not worthwhile to disclose your HIV status (45.3% versus 68.8%).

Table 31: Summary of multivariate results for print exposure and stigma

	Total			Males		Female	
	Unexposed	Exposed	PSM	Unexposed	Exposed	Unexposed	Exposed
Exposure to One Booklet (versus none)							
When learn that you are HIV+, life is over (%Disagree)	94.1%	95.2%	+	94.2%	96.4%	93.9%	93.5%
Telling people you are HIV+ doesn't help (%Disagree)	69.3%	54.6%*	NS	69.2%	67.1%	68.8%	45.3%**
Exposure to Two or More Booklets (versus none)							
Telling people you are HIV+ doesn't help (%Disagree)	69.3%	63.1%*	NS	69.2%	59.7%*	68.8%	65.9%
People in community would want to keep secret if family member has HIV (%Strongly agree/agree)	72.4%	78.2%*	+	78.1%	85.8%*	67.1%	71.9%
People in the community join together to help PLHIV (%Strongly agree/agree)	58.0%	65.7%**	+	56.7%	69.5%**	59.9%	62.4%

*=p<0.05 **=p<0.01

PSM: + significant/increasing ; - significant/decreasing ;NS not significant

The effects of exposure to different media channels on the stigma indicators are shown in Table 32, although there are no significant effects among the overall population or among males. Females who were exposed to two or more media channels are more likely than unexposed women to disagree that your life is over when you learn that you are HIV positive (95.6% versus 88.5%), but there is no effect on the other stigma indicators.

Table 32: Summary of multivariate results for multimedia exposure and stigma

	Total			Males		Female	
	Unexposed	Exposed	PSM	Unexposed	Exposed	Unexposed	Exposed
Exposure to One Media Channel (versus none)							
Telling people you are HIV+ doesn't help (%Disagree)	65.5%	69.7%	+	66.0%	66.8%	62.3%	71.4%
Exposure to Two or More Media Channels (versus none)							
When learn that you are HIV+, life is over (%Disagree)	92.8%	95.4%	NS	95.3%	94.8%	88.5%	95.6%*
Only promiscuous people get HIV (%Disagree)	75.3%	80.5%	+	70.0%	77.7%	77.4%	83.1%
People in the community join together to help PLHIV (%Strongly agree/agree)	60.0%	62.4%	+	59.1%	65.0%	60.5%	59.3%

*=p<0.05 **=p<0.01

PSM: + significant/increasing ; - significant/decreasing ;NS not significant

4.3.7 FORCED SEX AND PHYSICAL VIOLENCE

The overall prevalence of experiencing forced sex and personal physical violence is low in Swaziland (Table 33). Only 2.9% of the population – including 4.3% of women - report having experienced forced sex in the last 12 month. Of those who report forced sex, 35.6% reported the event - 80.7% reported it to a family, friend or neighbor, and 17.3% reported it to the authorities. To measure the prevalence of experiencing personal, physical violence, respondents were asked if "In the past 12 months, were you hit, slapped, kicked or otherwise physically hurt by a partner, friend ,or family member?" Overall, 6.1% of respondents reported experiencing physical violence, including 7.8% of all women and 7.7% of young women. Of the respondents who experienced physical violence, 65.7% reported it to someone, with a higher percentage of respondents reporting it to family, friends, or neighbors (73.6%) than to the police or other authorities (41.0%).[13]

Table 33: Reported forced sex and physical violence

	Percentage	N
Forced sex in the last 12 months	**2.9%**	**3937**
Females	4.3%	1973
Females 15-24	2.7%	769
Reported forced sex	35.6%	118
Reported GBV to family, friends, neighbor	80.7%	46
Reported GBV to authority	17.3%	46
GBV physical violence in last 12 months	**6.1%**	**3953**
Females	7.8%	1985
Females 15-24	7.7%	773
Reported GBV	65.7%	272
Reported GBV to family, friends, neighbor	73.6%	170
Reported GBV to authority	41.0%	170

Men exposed to one radio show are less likely to report experiencing forced sex in the last 12 months as compared with unexposed men. There are no statistically significant differences among women (Table 34). The PSM results indicate that of the respondents who experienced physical violence in the last 12 months, those exposed to one radio show are more likely to report this experience to family, friends, or a community member; there was no significant difference in the multivariate regression. There are mixed results for the effect of the various interventions on whether or not respondents agree that leaders in their communities speak out against gender-based violence. For example, there is a positive

[13] Please note that the small sample sizes for some of these indicators means they are not included in the multivariate analysis.

treatment effect of exposure to two or more radio programs on the percentage of respondents who agree or strongly agree that leaders in their communities speak out against gender-based violence (73.2% versus 60.6%). This result is confirmed by the PSM results. This effect of exposure to two or more radio programs is also seen among men - 78.3% among the exposed compared with 66.7% of the unexposed - but not among women. However, women exposed to one booklet are less likely to agree with this statement (-11.1 percentage point difference). Exposure to two or more booklets has a positive effect on this outcome for the total population among whom 76.2% of those exposed report that their community leaders speak out against gender-based violence as compared with 69.3% of the unexposed (Figure 18). Respondents exposed to two or more booklets are less likely to report experiencing physical violence in the last 12 months. This is true for the total population (3.9 percentage point difference), men (3.2 percentage point difference), and women (3.7 percentage point difference). Exposure to two or more media channels is also found to be positively associated with agreement that leaders are speaking out (by the PSM results) and among men (76.5% versus 64.8%) in the probit results.

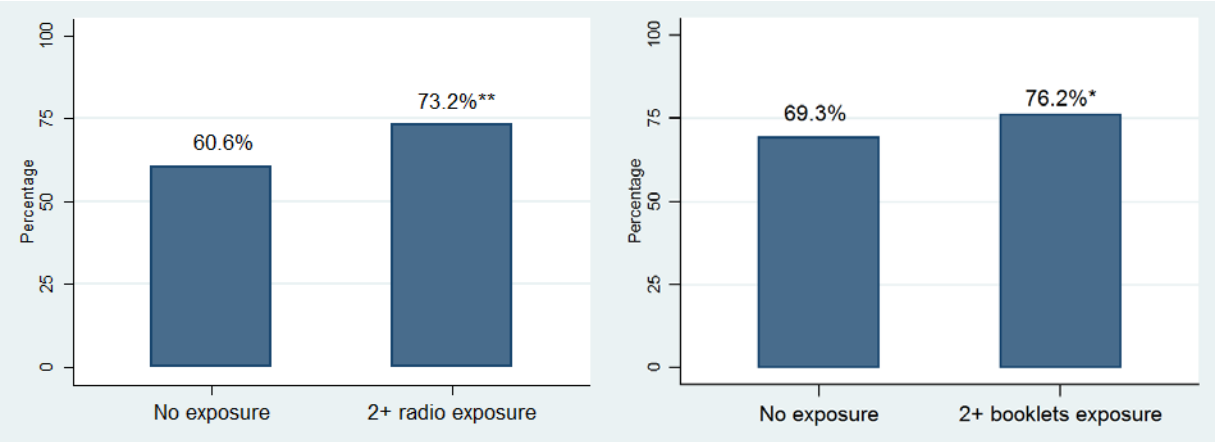
Table 34: Summary of multivariate results of OneLove exposure measures on gender-based violence

	Total			Males		Female	
	Unexposed	Exposed	PSM	Unexposed	Exposed	Unexposed	Exposed
Exposure to One Radio Show (versus none)							
Forced sex in the last 12 months	3.1%	2.5%	NS	1.9%	0.6%*	4.0%	3.9%
Report violence to family, friend, or community member	77.5%	77.0%	+				
Exposure to Two+ Radio Shows (versus none)							
Leaders speak out against GBV (%Strongly agree/agree)	60.6%	73.2%**	+	66.7%	78.3%*	57.4%	67.5%
Exposure to One Booklet (versus none)							
Forced sex in the last 12 months	2.9%	3.7%	NS	1.0%	2.6%*	4.7%	4.0%
Leaders speak out against GBV (%Strongly agree/agree)	64.2%	62.0%	NS	65.5%	73.8%	62.9%	51.8%**
Exposure to Two or More Booklets (versus none)							
Physical GBV in the last 12 months	8.0%	4.0%**	NS	5.7%	2.5%*	9.5%	5.8%*
Leaders speak out against GBV (%Strongly agree/agree)	64.2%	71.6%*	+	65.5%	79.1%**	62.9%	65.8%
Exposure to Two or More Media Channels (versus none)							
Physical GBV in the last 12 months	6.6%	5.8%	+	5.5%	4.0%	7.6%	7.8%
Leaders speak out against GBV (%Strongly agree/agree)	63.9%	69.2%	+	64.8%	76.5%**	65.5%	62.5%

*=p<0.05 **=p<0.01

PSM: + significant/increasing ; - significant/decreasing ;NS not significant

Figure 18: Effect of exposure to two or more radio programs and two or more booklets on agreement that leaders speak out against gender-based violence



4.4 RESULTS FOR VULNERABLE POPULATIONS

The following sections present the results of the multivariate analysis for vulnerable populations, starting with the results for women between the ages of 15 and 24 years, followed by those for populations living in border areas. In this section, results are presented by exposure measure: exposure to radio shows, television, print materials, and multiple channels.

4.4.1 YOUNG WOMEN AGED 15-24

4.4.1.1 EXPOSURE TO RADIO SHOWS

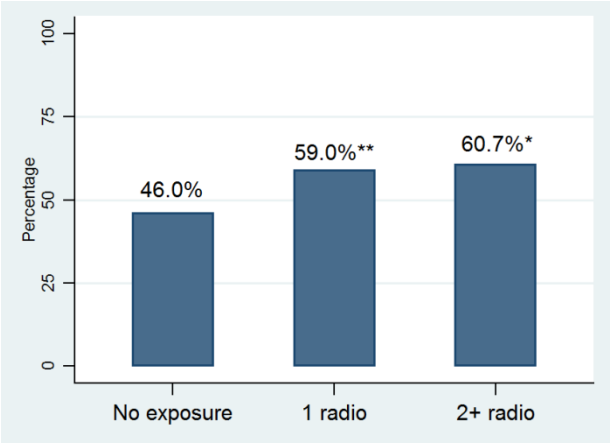
This section looks at the effect of radio exposure on various health outcomes among respondents who are female and between the ages of 15 and 24 (Tables 35). Radio exposure has no significant effect on the percentage of women who had multiple partners in the last 12 months but a lower percentage of young women exposed to one radio show report currently having more than one sexual partner (3.3% versus 8.9%). Both exposure levels are associated in this population with respondents agreeing with the statement that leaders discourage men from having younger partners (41.4% one show, 41.6% two or more shows as compared with 29.9%). It is also observed that a higher percentage of respondents disagree that they needed someone to fill a gap between regular sexual partners (78.5% versus 65.8%) and that men with many women are real men (98.2% versus 95.1%).

Three variables related to other HIV communication and HIV risk are significantly associated with exposure to radio shows. Positive associations exist at both levels with respondents agreeing that the

risk of contracting HIV decreases for a circumcised man (91.7% one radio show, 89.4% two or more radio shows as compared with 79.8%). Furthermore, a greater proportion of respondents exposed to one radio show (83.0%) disagree that if one spouse is HIV positive, the other is too, as compared with the unexposed (73.7%). The impact on HIV communication, however, appears limited; 15.7% of those exposed to one radio show and 6.9% of those exposed to two radio shows are dissatisfied when having sex with their regular partner, as opposed to 44.8% of the unexposed. The impact on condom use also appears limited, as the only significant association is between exposure to one radio show and respondents agreeing that condom use is accepted in marriage (73.6% in the exposed versus 62.3% in the unexposed).

Regarding HIV testing, a significant positive association exists between respondents ever being tested for HIV and exposure to one radio show, although there is no effect on this outcome from exposure to two or more radio programs. However, there appears to be a significant effect of radio exposure on being tested for HIV in the last 12 months (Figure 19). Approximately 60% of young women exposed to one radio program or two or more programs report having been tested for HIV in the last 12 months as compared with 46.0% of unexposed women.

Figure 19: Tested for HIV in the last 12 months by radio exposure, women 15-24



Those exposed to two radio shows are more likely to believe that pregnant women should be tested for HIV (97.6% versus 93.4%), but to have been less likely to report discussing the results of their most recent HIV test (66.2% versus 80.4%). Exposure to radio programs for this population appears to have numerous effects related to HIV treatment. For example, 95.1% of those exposed to one radio show report being willing to care for someone on ART, as compared with 85.9% of the unexposed. Also, those exposed to two radio shows are more likely to know that a person living with HIV needs to use condoms because they can transmit HIV than those who were unexposed.

HIV stigma also appears to be affected by radio exposure, as 97.6% of those exposed to one radio show and 95.4% of those exposed to two radio shows disagree with the statement that when one learns that they are HIV positive their life is over, as compared with 89.7% of the unexposed. Contrastingly, those exposed to two radio shows are less likely to disagree with the statement that HIV is punishment for

sinning (72.5% versus 82.7%). Finally, one association between a gender-based violence (GBV) outcome and exposure to radio shows is statistically significant; 69.5% of those exposed to two radio shows agree that their leaders speak out against GBV, as compared with 52.4% of the unexposed.

Table 35: Summary of results of exposure to radio shows -women 15-24

	Unexposed	Exposed
One radio show		
Multiple Partners		
Multiple partners (past 12 months)	13.6%	8.4%
More than one partner within 3 months period (past 12 months)	8.9%	3.3%*
Most married men faithful to wives (%Agree)	9.8%	5.3%*
Need someone to fill gap (%Disagree)	65.8%	78.5%*
Men with many women are real men (%Disagree)	95.1%	98.2%*
Leaders discourage men from having younger partners (%Very often/sometimes)	29.9%	41.4%*
Other HIV Risk Factors		
If one spouse positive, the other too (%False)	73.7%	83.0%*
STIs decrease HIV infection (%False)	86.1%	92.5%*
Risk of contracting HIV decreases for a circumcised man	79.8%	91.7**
HIV Communication		
Percentage who are dissatisfied when having sex with spouse/regular cohabitating	44.8%	15.7%*
Condom Use		
Condom use at last sex with regular partner	64.8%	56.3%
Condom use in marriage accepted (%Strongly agree/agree)	62.3%	73.6%*
HIV Testing		
Ever tested for HIV	56.0%	68.2%*
Tested for HIV in last 12 months	45.9%	59.0%**
HIV Treatment		
Willing to care for someone on ART	85.9%	95.1%**
ARVs prevent MCT during pregnancy	76.7%	86.4%*
ARVs prevent MCT during childbirth	71.8%	83.0%**
ARVs prevent MCT during breastfeeding	67.4%	82.6%**
HIV Stigma		
When learn that you are HIV+, life is over (%Disagree)	89.7%	97.6%**
Two + Radio Shows		
	Unexposed	**Exposed**
Multiple Partners		
Multiple partners (past 12 months) among sexually experienced	13.6%	7.2%
Leaders discourage men from having younger partners (%Very often/sometimes)	29.9%	41.6%*
Other HIV Risk Factors		
Risk of contracting HIV decreases for a circumcised man	79.8%	89.4%**
HIV Communication		
Percentage who are dissatisfied when having sex with spouse/regular cohabitating	44.8%	6.9%**

	Unexposed	Exposed
Condom Use		
Condom use at last sex with regular partner	64.8%	75.3%
HIV Testing		
Ever tested for HIV	56.0%	64.8%
Tested for HIV in the last 12 months	45.9%	60.7%*
Discussed results of most recent HIV test	80.4%	66.2%*
Pregnant woman should test for HIV (%True)	93.4%	97.6%*
Leaders encourage HIV testing (%Strongly agree/agree)	53.8%	65.7%*
HIV Treatment		
PLHIV on ART can transmit HIV (%True)	88.9%	79.4%*
PLHIV does not need to use condoms because cannot transmit HIV (%False)	91.4%	96.8%*
ARVs prevent MCT during childbirth	71.8%	81.2%*
Leaders encourage HIV treatment (%Strongly agree/agree)	55.7%	67.2%*
HIV Stigma		
When learn that you are HIV+, life is over (%Disagree)	89.7%	95.4%*
HIV is punishment for sinning (%Disagree)	82.7%	72.5%*
GBV		
Leaders speak out against GBV (%Strongly agree/agree)	52.37%	69.5%**
*=p<0.05 **=p<0.01 PSM: + significant/increasing ; - significant/decreasing ;NS not significant		

4.4.1.2 EXPOSURE TO TELEVISION

Table 36 shows the results of the effect of exposure to television for females between the ages of 15 and 24 in Swaziland. Overall, exposure to TV does not appear to have a great effect on health outcomes examined in this evaluation. There is no difference between exposed and unexposed women in terms of having multiple sexual partners in the last 12 months. Exposed women are less likely to report a 10 year or more age difference between themselves and their last sexual partner (5.1% versus 15.5%) and are more likely to disagree that men with many women are real men and that men have the right to sex in exchange for gifts. Exposed women are more likely to be dissatisfied when having sex with their spouse or cohabitating partner then the unexposed (20.7% versus 8.6%) but there are no significant differences in communication with their partners about this.

No statistically significant associations exist between exposure to TV and condom use; however, the percentage of respondents that used a condom at last sex is in the hypothesized direction. Similar to exposure to radio, there are multiple significant associations between HIV testing and treatment and exposure to TV; although, most of these are in the unexpected direction. For example, 52.8% of the exposed reported that their leaders encourage HIV testing as compared with 67.8% of the unexposed.

Additionally, the unexposed are on average tested more times for HIV than those exposed to TV. Finally, the exposed are less likely to have participated in the PMTCT program (13.7% versus 23.2%).

Regarding HIV stigma, two significant associations exist, and no associations exist with the GBV variables. Relative to unexposed respondents, the exposed are less likely to disagree with the statement that telling people you are HIV positive does not help (53.4% versus 69.2%). Additionally, 79.9% of this exposed population agree that it should be kept a secret if a family member has HIV, as compared with 59.1% of the unexposed.

Table 36: Summary of results of exposure to television-women 15-24

	Unexposed	Exposed
Multiple Partners		
Multiple partners (past 12 months) among sexually experienced	9.6%	9.5%
10+ year age difference between respondent and last sexual partner	15.5%	5.1%*
Men with many women are real men (%Disagree)	94.7%	98.6%**
Men have right to get sex for gifts (%Disagree)	85.1%	94.2%**
HIV Communication		
Percentage who are dissatisfied when having sex with spouse/regular cohabitating	8.6%	20.7%*
Condom Use		
Condom use at last sex with regular partner	64.4%	67.0%
HIV Testing		
Ever tested for HIV	64.9%	62.6%
Tested for HIV in the last 12 months	55.7%	56.7%
Discussed results of most recent HIV test	70.6%	85.4%**
Leaders encourage HIV testing (%Strongly agree/agree)	67.8%	52.8%**
Number of Times Tested for HIV	2.5	1.7*
HIV Treatment		
PLHIV on ART can transmit HIV (%True)	88.4%	82.5%*
Participated in a PMTCT program	23.2%	13.7%*
HIV Stigma		
Telling people you are HIV+ doesn't help (%Disagree)	69.2%	53.4%**
Keep secret if family member has HIV (%Strongly agree/agree)	59.1%	79.9%**
*=p<0.05 **=p<0.01		
PSM: + significant/increasing ; - significant/decreasing ;NS not significant		

4.4.1.3 EXPOSURE TO PRINT MATERIALS

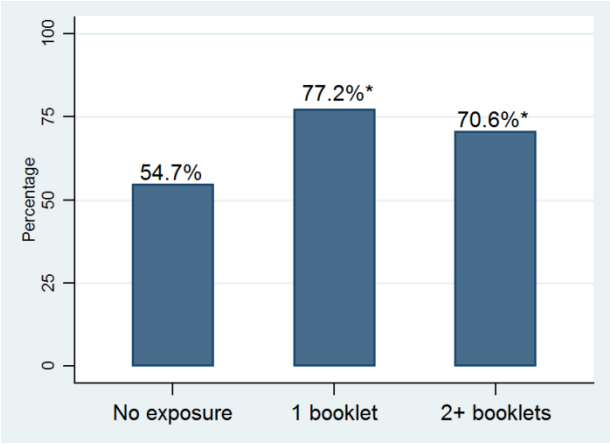
Table 37 shows the associations for exposure to print media for the 15 to 24 year old female population, specifically to one or two booklets. Exposure to one booklet has unexpected associations with multiple partner variables. For example, 9.5% of women exposed to one booklet report having more than one

partner in the last 3 months as compared with 4.7% of unexposed women. Furthermore, those exposed to one booklet are less likely to disagree with the statement that men with many women are real men as compared with the unexposed. The results for exposure to two or more booklets are more encouraging. Those exposed and sexually experienced are less likely to report currently having multiple partners than the unexposed. In addition, females exposed to two booklets have a lower reported number of lifetime partners (1.1 partners) on average as compared with the unexposed (1.6 partners).

Exposure to print media has different associations with other HIV risk factors depending upon the level of exposure. For example, 79.5% of the exposed believe that the statement that STIs decrease HIV infection is false, as compared with 89.8% of the unexposed. Those exposed to two booklets are more likely to believe that they are infected now with HIV (31.6% versus 18.8%). There is a significant treatment effect of exposure to radio messaging and increased discussion about HIV/AIDS. For example, 85.8% of young women exposed to one radio program and 78.4% of young women exposed to two or more programs report talking about HIV with their friends as compared with 58.2% of unexposed.

Condom use appears to be associated with exposure to print media. Almost 82% of those exposed to one booklet report using a condom at last sex with their regular partner, as compared with 55.8% of the unexposed; however, while this effect is in the same direction for those exposed to two booklets, it is not statistically significant. Both levels of exposure are significantly associated with overall condom use at last sex (77.2% for those exposed to one booklet; 70.6% for those exposed to two booklets; versus 54.7% for the unexposed, Figure 20). It is important to note that this outcome is not significant for all women, just among young women.

Figure 20: Condom use at last sex and booklet exposure, women 15-24



Exposure to one booklet has significant effects on both ever being tested for HIV (72.6% as compared with 59.7%) and tested for HIV in the last 12 months (68.6% as compared with 49.5%). There are a greater number of associations between this exposure and variables measuring HIV treatment; however, only one is significant for those exposed to two booklets. Those in this exposure group are less likely to report ever being tested for HIV as compared with the unexposed (1.1% versus 4.9%). The group exposed to one booklet appears to be

more knowledgeable about HIV treatment, correctly agreeing with four statements on HIV treatment with greater likelihood, such as “people on ART have to stay on treatment for the rest of their lives” (93.7% versus 84.2%).

Finally, while no significant associations between this exposure and GBV variables exist, a few related to HIV stigma are observed. Surprisingly, of those exposed to two booklets, 75.6% disagree with the statement that only promiscuous people get HIV, which is significantly lower than the 83.7% of the unexposed that disagreed. Similarly, just 44.8% of those exposed to one booklet disagree that telling people you are HIV positive does not help, as compared with 69.8% of the unexposed.

Table 37: Summary of results of exposure to print materials-women 15-24

	Unexposed	Exposed
One Booklet		
Multiple Partners		
Multiple partners (past 12 months) among sexually experienced	8.1%	9.8%
More than one partner within 3 months period (past 12 months)	4.7%	9.5%*
Men with many women are real men (%Disagree)	97.3%	91.9%*
Other HIV Risk Factors		
STIs decrease HIV infection (%False)	89.8%	79.5%*
HIV Communication		
Discussed HIV/AIDS with friends	58.2%	85.8%**
Discussed HIV/AIDS with spouse, children, and/or friends	64.4%	91.1%**
Condom Use		
Condom use at last sex	54.7%	77.2%*
Condom use at last sex with regular partner	55.8%	81.5%**
HIV Testing		
Ever tested for HIV	59.7%	72.6%*
Tested for HIV in last 12 months	49.5%	68.6%**
HIV Treatment		
ARVs prevent MCT during pregnancy	82.5%	90.9%*
ARVs prevent MCT during childbirth	79.2%	90.1%**
ARVs prevent MCT during breastfeeding	72.7%	86.5%*
People on ART have to stay on treatment for rest of lives	84.2%	93.7%*
HIV Stigma		
Telling people you are HIV+ doesn't help (%Disagree)	69.8%	44.8%**
Keep secret if family member has HIV (%Strongly agree/agree)	63.4%	78.3%*
Two or More Booklets		
Multiple Partners		
Multiple partners (past 12 months) among sexually experienced	8.1%	11.6%
Reports currently (3mths) having more than one partner	5.1%	1.3%**
Agrees that husband/cohabitating partner has another sex partner who is not a wife	36.7%	21.5%*

	Unexposed	Exposed
Number of lifetime partners	1.6	1.1*
Other HIV Risk Factors		
Likely to be infected now (%Agree)	18.8%	31.6%*
HIV Communication		
Discussed HIV/AIDS with friends	58.2%	78.4%**
Discussed HIV/AIDS with spouse, children, and/or friends	64.4%	81.6%**
Condom Use		
Condom use at last sex	54.7%	70.6%*
Condom use at last sex with regular partner	55.8%	66.3%
HIV Testing		
Ever tested for HIV	59.7%	63.5%
Tested for HIV in last 12 months	49.5%	56.6%
HIV Treatment		
Has ever taken ARVs	4.9%	1.1%**
HIV Stigma		
Only promiscuous people get HIV (%Disagree)	83.7%	75.6%*
*=p<0.05 **=p<0.01		
PSM: + significant/increasing ; - significant/decreasing ;NS not significant		

4.4.1.4 EXPOSURE TO MEDIA CHANNELS

The results for exposure to various media channels are shown in Table 38. On average, those exposed to two or more channels are approximately a year older at the time they first have sex; however, this association is not significant for those exposed to one channel. A higher percentage of women exposed to one channel know that having multiple partners increases the risk for HIV (96.0% versus 86.5%). Additionally, 37.9% of those exposed to one media channel state that polygamy is practiced in their community very often or sometimes, as compared with 18.9% of the unexposed. It is also observed that a greater percentage of women exposed at any level are more likely to agree that wife inheritance is practiced in their community than unexposed women.

Both levels of multimedia exposure are associated with a greater percentage of respondents correctly stating that it is false that STIs decrease HIV infection (93.0% exposed to one media channel; 89.6% exposed to two or more media channels; versus 76.4% of the unexposed). Also related to other HIV factors, 95.1% of those exposed to one media channel know where to get information about HIV/AIDS, as compared to 81.9% in the unexposed population. Differences appear between levels of exposure and HIV communication. While there is a positive association between agreeing that their sex life improves

with communication with their partner and exposure to one channel, this association is not significant at the higher level of exposure. Similarly, exposure to two or more media channels is associated with a greater likelihood of discussing HIV/AIDS with friends and one's spouse or children (80.0% versus 64.0%); however, this is not significant for those exposed to one media channel.

Similar to the findings stated above, only one statistically significant association exists between attitudes towards condom use and this exposure measure. Those exposed to one media channel are more likely to agree than the unexposed that condom use in marriage is accepted (75.1% versus 59.1%). Only two associations are observed between exposure to media channels and HIV testing. At both levels of exposure, females aged 15 to 24 years and exposed to multiple media channels are more likely to agree that pregnant women should test for HIV than those who were not exposed (98.2% at one channel; 94.7% at two or more channels; versus 86.3% of the unexposed).

Similar to previously noted associations, knowledge of HIV treatment appears to be affected by exposure to media channels. For example, those exposed to two or more media channels correctly agree with three statements on HIV treatment with greater likelihood, and a greater proportion of those exposed to one media channel correctly identify that it is false that a person living with HIV does not need to use condoms because they cannot transmit HIV, as compared with the unexposed (98.2% versus 87.7%). Additionally, 95.8% of those exposed to one media channel state that they would be willing to care for someone on ART, as compared with 83.4% of the unexposed.

Again, no significant associations with GBV exist with this exposure; however, exposure to multiple media channels has a negative effect on two stigma-related outcomes; greater percentage of respondents agree that people in their community would want to keep secret if a family member has HIV (74.6% exposed to one channel, 71.0% exposed to two or more, and 44.2% of the unexposed). Also, 95.7% of those exposed to two or more media channels disagree with the statement that when you learn that you are HIV positive your life is over, compared to 88.9% of the unexposed.

Table 38: Summary of results of exposure to multiple media channels-women 15-24

	Unexposed	Exposed
One Channel		
Multiple Partners		
Multiple partners (past 12 months)	13.8%	8.1%
Multiple sexual partners increase HIV risk (%True)	86.5%	96.0%*
Polygamy is practiced in community (%Very often/sometimes)	18.9%	37.9%**
Agrees that wife inheritance is practiced in the community	3.5%	15.7%*

	Unexposed	Exposed
Other HIV Risk Factors		
STIs decrease HIV infection (%False)	76.4%	93.0%**
Knows where to get information about HIV/AIDS	81.9%	95.1%**
HIV Communication		
Sex life improves with communication with partner (%Agree)	84.6%	93.7%*
Condom Use		
Condom use at last sex with regular partner	55.0%	53.2%
Condom use in marriage accepted (%Strongly agree/agree)	59.1%	75.1%*
HIV Testing		
Ever tested for HIV	54.0%	62.9%
Tested for HIV in last 12 months	43.0%	51.9%
Pregnant woman should test for HIV (%True)	86.3%	98.2%**
HIV Treatment		
Willing to care for someone on ART	83.4%	95.8%*
PLHIV does not need to use condoms because cannot transmit HIV (%False)	87.7%	98.2%**
HIV Stigma		
Keep secret if family member has HIV (%Strongly agree/agree)	44.2%	74.6%**
Two Channels		
Multiple Partners		
Multiple partners (past 12 months)	13.8%	9.4%
Agrees that wife inheritance is practiced in the community	3.5%	16.1%*
Age at first sex	16.9	17.9*
Other HIV Risk Factors		
STIs decrease HIV infection (%False)	76.4%	89.6%*
HIV Communication		
Discussed HIV/AIDS with friends	58.8%	75.1%*
Discussed HIV/AIDS with spouse, children, and/or friends	64.0%	80.0%*
Condom Use		
Condom use at last sex with regular partner	55.0%	72.7%
HIV Testing		
Ever tested for HIV	54.0%	65.9%
Tested for HIV in last 12 months	43.0%	60.3%*
Pregnant woman should test for HIV (%True)	86.3%	94.7%**
HIV Treatment		
ARVs prevent MCT during pregnancy	72.9%	84.8%*
ARVs prevent MCT during childbirth	70.7%	81.5%*
ARVs prevent MCT during breastfeeding	66.1%	80.2%*
Has ever taken ARVs	7.6%	1.7%*
HIV Stigma		
When learn that you are HIV+, life is over (%Disagree)	88.9%	95.7%*
Keep secret if family member has HIV (%Strongly agree/agree)	44.2%	71.0%**

*=p<0.05 **=p<0.01

	Unexposed	Exposed
PSM: + significant/increasing ; - significant/decreasing ;NS not significant		

4.4.2 BORDER AREAS

4.4.2.1 EXPOSURE TO RADIO SHOWS

This section looks at the effect of radio exposure on various health outcomes among respondents who reside in border areas (Table 39). Respondents exposed to one radio show are less likely to have more than one partner within a three month period. Among those that were sexually experienced, this association was the same. Additionally, 87.4% of border respondents that were exposed to one radio show disagree with the statement that men have the right to get sex from girls, as compared with 80.9% of the unexposed. This effect is also observed with two radio shows (88.3% versus 80.9%). Exposed individuals also report a higher age at first sex – 19.0 years on average for exposed respondents as compared with 18.1 years for the unexposed. There are two associations between exposure to two radio shows and multiple partnerships that are not significant with one radio show. Exposed respondents are more likely to report that leaders discourage multiple partners and that polygamy is practiced in the community.

Only two variables related to HIV communication are significantly associated with exposure to one radio show, while there are none with two radio shows. This includes a higher percentage of respondents agreeing with the statement that one's sex life improves with communication with a partner (93.3% versus 88.2%) and the percent of respondents who are satisfied when having sex with their spouse or regular cohabitating partner (92.8% versus 84.1%).

Just one variable for each HIV testing and HIV treatment is significantly associated with exposure to radio shows. Those who were exposed to two radio shows are more likely to agree that leaders encourage HIV testing (70.3% versus 56.1%). Those who were exposed to one radio show are more likely to report being willing to care for someone on ART.

There are no significant associations found between gender-based violence and exposure to radio shows. Regarding HIV stigma, 83.0% of respondents exposed to one radio show disagree that HIV is punishment for sinning, as compared with 75.8% of the unexposed. As has been seen with the general and young women population, 78.9% of respondents exposed to two radio shows agree that people in

their community would want it kept it a secret if a family member has HIV, as compared with 72.4% of the unexposed.

Table 39: Summary of results of exposure to radio-border

	Unexposed	Exposed
One Radio Show		
Multiple Partners		
Multiple partners (past 12 months)	18.3%	16.2%
Multiple partners (past month)	6.3%	3.4%
More than one partner within 3 months period (past 12 months)	15.1%	6.9%*
Reports currently (3mths) having more than one partner	11.2%	4.6%*
Men have right to get sex for gifts (%Disagree)	80.9%	87.4%*
Age at first sex	18.1	19.0*
HIV Communication		
Sex life improves with communication with partner (%Agree)	88.2%	93.3%*
Percentage who are satisfied when having sex with spouse/regular cohabitating	84.1%	92.8%**
Condom Use		
Condom use at last sex with regular partner	50.8%	50.9%
Condom at last sex among those with multiple partners	66.4%	74.2%
Condom use in marriage accepted (%Strongly agree/agree)	68.7%	80.3%**
Women can ask regular partner to use condom (%Strongly agree/agree)	71.1%	77.7%*
HIV Testing		
Ever tested for HIV	67.0%	68.1%
HIV test in the last 12 months	49.1%	49.0%
HIV Treatment		
Willing to care for someone on ART	90.9%	94.8%*
HIV Stigma		
HIV is punishment for sinning (%Disagree)	75.8%	83.0%*
Two + Radio Shows		
Multiple Partners		
Multiple partners (past 12 months)	18.3%	18.0%
Multiple partners (past month)	6.3%	4.2%
Reports currently (3mths) having more than one partner	11.2%	13.4%
Men have right to get sex for gifts (%Disagree)	80.9%	88.3%*
Leaders discourage multiple partners (%Very often/sometimes)	41.3%	52.8%*
Polygamy is practiced in community (%Very often/sometimes)	30.6%	40.7%*
Condom Use		
Condom use at last sex with regular partner	50.8%	59.2%
Condom at last sex among those with multiple partners	66.4%	64.2%
Condom use in marriage accepted (%Strongly agree/agree)	68.7%	79.8%*
HIV Testing		
Ever tested for HIV	67.0%	71.1%
HIV test in the last 12 months	49.1%	57.2%
Leaders encourage HIV testing (%Strongly agree/agree)	56.1%	70.3%*
HIV Stigma		

	Unexposed	Exposed
Keep secret if family member has HIV (%Strongly agree/agree)	72.4%	78.9%*
*=p<0.05 **=p<0.01		
PSM: + significant/increasing ; - significant/decreasing ;NS not significant		

4.4.2.2 EXPOSURE TO TELEVISION

Table 40 shows the results of exposure to television for populations that live near the borders of Swaziland. Regarding multiple partners, those border residents who were exposed are more likely to disagree with the statement that men have the right to get sex for gifts (87.8% versus 83.5%). Additionally, 49.3% of those exposed respondents agree that leaders discourage multiple partners either very often or sometimes, as compared with 41.9% of the unexposed. Regarding other HIV risk factors, those exposed to television are more likely to know where to get information about HIV/AIDS (94.8% versus 88.6%). There are no significant associations between television and condom use for this population.

Multiple positive associations are evident with HIV testing variables. For example, 76.5% of those exposed report that they had ever been tested for HIV, as compared with 63.3% of those who were not exposed. Additionally, exposed respondents were more likely to be tested for HIV in the last 12 months, to have discussed the results of their most recent HIV test, and to have been tested a greater number of times than those who were unexposed (2.5 times versus 2.0 times).

Finally, while no significant associations are evident between gender-based violence and exposure to television, there is one effect found on HIV stigma. Those who were exposed to television are more likely to agree with the statement that it should be kept a secret if a family member has HIV (81.7% versus 72.8%).

Table 40: Summary of results of television exposure -border

	Unexposed	Exposed
Multiple Partners		
Multiple partners (past 12 months)	15.5%	19.5%
Multiple partners (past month)	4.3%	4.7%
Reports currently (3mths) having more than one partner	7.6%	10.6%
Men have right to get sex for gifts (%Disagree)	83.5%	87.8%*
Leaders discourage multiple partners(%Very often/sometimes)	41.9%	49.3%*
Other HIV Risk Factors		
Knows where to get information about HIV/AIDS	88.6%	94.8%**
Condom Use		

	Unexposed	Exposed
Condom use at last sex with regular partner	50.4%	58.1%
Condom at last sex among those with multiple partners	72.7%	64.4%
HIV Testing		
Ever tested for HIV	63.3%	76.5%**
HIV test in the last 12 months	45.4%	61.4%**
Discussed results of most recent HIV test	80.3%	87.1%*
Number of times tested for HIV	2.0	2.5*
HIV Treatment		
PLHIV on ART can transmit HIV (%True)	92.9%	86.3%*
HIV Stigma		
Keep secret if family member has HIV (%Strongly agree/agree)	72.8%	81.7%*
*=p<0.05 **=p<0.01		
PSM: + significant/increasing ; - significant/decreasing ;NS not significant		

4.4.2.3 EXPOSURE TO PRINT

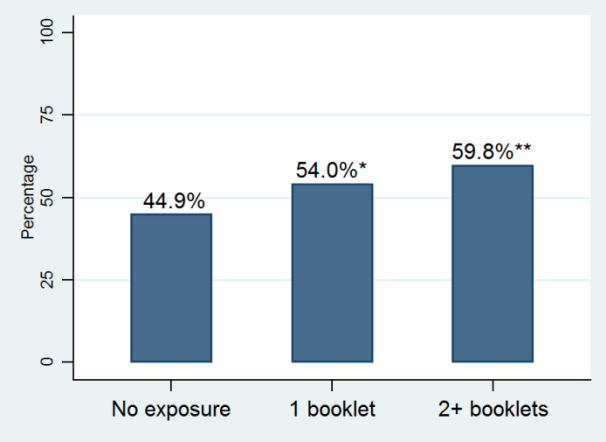
Table 41 shows the results for exposure to print media for border populations, specifically to one or two booklets. Exposure to one booklet has no effect on the variables related to multiple partners; however, exposure to two booklets is negatively associated with currently having more than one sexual partner (12.1% among the exposed versus 7.7% among the unexposed). Additionally, 40.1% of those exposed to two booklets think that their last partner had other sexual partners, as compared with 54.1% of those who were unexposed.

Exposure to print media does have an effect on other HIV risk factors. For example, those who were exposed to one booklet are more likely to say the statement that if one spouse tests positive for HIV, the other is too (80.5% versus 68.9%). Additionally, 94.5% of those exposed to one booklet and 91.3% exposed to two booklets agree that the risk of contracting HIV decreases for a circumcised man, as compared with 85.2% of the unexposed. Furthermore, those in the border population that were exposed to two booklets are more likely to disagree that STIs decrease HIV infection (93.5% versus 89.1%).

In terms of HIV communication, both exposure to one and two booklets have the same associations; there is a 9 percentage point difference between those exposed to one or two or more booklets and the unexposed when it comes to discussing HIV/AIDS with friends. Additionally, 88.3% of those exposed to one booklet and 85.4% of those exposed to two booklets report discussing HIV/AIDS with their spouse, children, or friends.

Exposure to print media does not have any significant effect on condom use; however, there are associations found with variables related to HIV testing. Those exposed to print media are more likely to report having an HIV test within the last 12 months, including 59.8% for two booklets and 54.0% for one booklet as compared with 44.9% (Figure 21). Those exposed to two booklets are also more likely to have ever been tested for HIV (73.2% versus 64.5%), and to agree that their leaders encourage HIV testing (65.7% versus 57.4%).

Figure 21: Print and exposure and HIV testing in the last 12 months, border populations



Multiple associations are evident between print media and HIV treatment variables, including exposure to one booklet and agreeing that ARVs prevent MCT during pregnancy (88.3% versus 74.9%), childbirth (82.8% versus 70.6%), breastfeeding (81.0% versus 68.7%) and that people on ART have to stay on treatment for the rest of their lives. Exposure to two booklets is positively associated with the respondent being willing to care for someone on ART (94.9% versus 90.6%). Those exposed to two booklets are also more likely to agree that ARVs prevent MCT during childbirth (81.7% versus 70.6%).

Again, there are no statistically significant associations between the exposed border population and gender-based violence. However, related to HIV stigma, 86.5% of those exposed to one booklet disagree that HIV is punishment for sinning, as compared with 75.9% of the unexposed. Furthermore, 81.5% of those exposed to two booklets agreed that people in their community would want to keep it a secret if a family member has HIV, as compared with 71.5% of the unexposed. Those exposed to two booklets are also more likely to agree that people in the community join together to help PLHIV.

Table 41: Summary of results of exposure to print materials-border

	Unexposed	Exposed
One Booklet		
Multiple Partners		
Multiple partners (past 12 months)	15.9%	19.2%
Multiple partners (past month)	5.0%	4.2%
Reports currently (3mths) having more than one partner	7.7%	6.4%
Other HIV Risk Factors		
If one spouse positive, the other too (%False)	68.9%	80.5%*
Risk of contracting HIV decreases for a circumcised man	85.2%	94.5%**

	Unexposed	Exposed
HIV Communication		
Discussed HIV/AIDS with friends	68.4%	77.7%*
Discussed HIV/AIDS with spouse, children, and/or friends	77.5%	88.3%**
Condom Use		
Condom use at last sex with regular partner	52.8%	51.6%
Condom at last sex among those with multiple partners	62.3%	72.3%
HIV Testing		
Ever tested for HIV	64.5%	71.4%
HIV test in the last 12 months	44.9%	54.1%*
HIV Treatment		
ARVs prevent MCT during pregnancy	74.9%	88.3%**
ARVs prevent MCT during childbirth	70.6%	82.8%**
ARVs prevent MCT during breastfeeding	68.7%	81.0%**
People on ART have to stay on treatment for rest of lives	89.8%	97.4%**
HIV Stigma		
HIV is punishment for sinning (%Disagree)	75.9%	86.5%*
Two Booklets		
Multiple Partners		
Multiple partners (past 12 months)	15.9%	19.0%
Multiple partners (past month)	5.0%	4.0%
Reports currently (3mths) having more than one partner	7.7%	12.1%*
Thinks that last partner had other sexual partners	54.1%	40.1%**
Other HIV Risk Factors		
STIs decrease HIV infection (%False)	89.1%	93.5%*
Risk of contracting HIV decreases for a circumcised man	85.2%	91.3%**
HIV Communication		
Discussed HIV/AIDS with friends	68.4%	77.0%*
Discussed HIV/AIDS with spouse, children, and/or friends	77.5%	85.4%**
Condom Use		
Condom use at last sex with regular partner	52.8%	53.8%
Condom at last sex among those with multiple partners	62.3%	79.2%
HIV Testing		
Ever tested for HIV	64.5%	73.2%**
HIV test in the last 12 months	44.9%	59.8%**
Leaders encourage HIV testing (%Strongly agree/agree)	57.4%	65.7%*
HIV Treatment		
Willing to care for someone on ART	90.6%	94.9%**
PLHIV does not need to use condoms because cannot transmit HIV (%False)	93.8%	89.1%*
ARVs prevent MCT during childbirth	70.6%	81.7%*
ARVs prevent MCT during breastfeeding	68.7%	80.5%**
HIV Stigma		
Keep secret if family member has HIV (%Strongly agree/agree)	71.5%	81.5%**
People in the community join together to help PLHIV (%Strongly agree/agree)	47.3%	54.5%*

*=p<0.05 **=p<0.01

	Unexposed	Exposed
PSM: + significant/increasing ; - significant/decreasing ;NS not significant		

4.4.2.4 EXPOSURE TO MEDIA CHANNELS

Exposure to multiple media channels (one or two or more) appears to have a significant effect on key behaviors such as multiple partnerships (Table 42). Exposure to one media channel and currently having more than one partner are negatively associated; however, those who were exposed two either one or two channels have significantly higher numbers of lifetime partners (3.4 partners for one channel and 4.3 partners for two channels as compared with 1.9 partners among the unexposed). Both exposures are associated with a higher reported age at first sex, but only exposure to two or more channels is associated with a higher proportion of respondents agreeing that they are likely to be infected with HIV now. Additionally, both exposures are similarly associated with HIV communication, with 93.8% of those exposed to one channel and 92.1% of those exposed to two or more channels agreeing that one's sex life improves with communication with their partner, as compared with 85.8% of the unexposed.

Exposure to media channels has a limited impact on condom use behaviors although the relationships are generally in an encouraging direction. Both exposures show positive associations with those agreeing that condom use in marriage is accepted (76.4% exposed to one channel, 78.4% exposed to two or more channels, and 69.5% of the unexposed). In addition, 77.1% of those exposed to one media channel agree that women can ask their partner to use a condom, as compared with 67.9% of the unexposed border population.

A greater number of statistically significant associations with HIV testing and treatment variables are found among those exposed to two or more media channels than those exposed to just one channel. Positive associations in both exposures are observed with respondents being more likely to agree that pregnant women should test for HIV. Only exposure to one channel is associated with a greater percentage of respondents who reported that they had participated in a PMTCT program. Those exposed to two or more media channels have greater knowledge of HIV treatment. Furthermore, 58.0% of these respondents reported that they had been tested for HIV in the last 12 months (as compared with 42.9% of the unexposed), and 73.2% reported being tested at some point in their life for HIV (ascompared with 56.9%).

Again, no significant associations are observed with this exposure and gender-based violence. Exposed individuals are more likely to agree that community members would to keep a family member's HIV positive status a secret (76.1% exposed to one channel, 80.1% exposed to two or more channels, compared with 62.6% of unexposed respondents). Also related to HIV stigma, those exposed to two or more channels are more likely to disagree that HIV is a punishment for sinning than those not exposed to any media channels (85.2% versus 69.9%).

Table 42: Summary of results of exposure to multiple media channels-border

	Unexposed	Exposed
One Channel		
Multiple Partners		
Multiple partners (past 12 months)	17.7%	12.8%
Multiple partners (past month)	8.3%	3.3%
Reports currently (3mths) having more than one partner	13.4%	3.7%**
Number of lifetime partners	1.9	3.4*
Age at first sex	17.5	18.6**
HIV Communication		
Sex life improves with communication with partner (%Agree)	85.8%	93.8%**
Condom Use		
Condom use at last sex with regular partner	50.6%	55.1%
Condom at last sex among those with multiple partners	76.0%	64.0%
Condom use in marriage accepted (%Strongly agree/agree)	69.5%	76.4%*
Women can ask regular partner to use condom (%Strongly agree/agree)	67.9%	77.1%*
HIV Testing		
Ever tested for HIV	56.9%	66.9%
HIV test in the last 12 months	42.9%	47.3%
Pregnant woman should test for HIV (%True)	93.0%	97.8%**
HIV Treatment		
Participated in a PMTCT program	13.6%	24.0%*
HIV Stigma		
Keep secret if family member has HIV (%Strongly agree/agree)	62.6%	76.1%**
Two Channels		
Multiple Partners		
Multiple partners (past 12 months)	17.7%	19.8%
Multiple partners (past month)	8.3%	3.6%
Reports currently (3mths) having more than one partner	13.4%	10.0%
Men have right to get sex for gifts (%Disagree)	79.8%	89.5%*
Leaders discourage multiple partners (%Very often/sometimes)	39.6%	47.7%*
Number of lifetime partners	1.9	4.3*
Age at first sex	17.5	18.9**
Other HIV Risk Factors		
Likely to be infected now (%Agree)	13.2%	22.5%*
HIV Communication		
Sex life improves with communication with partner (%Agree)	85.8%	92.1%*

	Unexposed	Exposed
Condom Use		
Condom use at last sex with regular partner	50.6%	53.6%
Condom at last sex among those with multiple partners	76.0%	70.6%
Condom use in marriage accepted (%Strongly agree/agree)	69.5%	78.4%*
HIV Testing		
Ever tested for HIV	56.9%	73.2%*
HIV test in the Last 12 months	42.9%	58.0%*
Pregnant woman should test for HIV (%True)	93.0%	97.5%*
HIV Treatment		
Willing to care for someone on ART	88.5%	95.%*
ARVs prevent MCT during pregnancy	73.7%	85.7%*
ARVs prevent MCT during childbirth	69.6%	80.1%*
ARVs prevent MCT during breastfeeding	66.6%	77.8%*
HIV Stigma		
HIV is punishment for sinning (%Disagree)	69.0%	85.2%*
Keep secret if family member has HIV (%Strongly agree/agree)	62.6%	80.1%**

*=p<0.05 **=p<0.01

PSM: + significant/increasing ; - significant/decreasing ;NS not significant

CHAPTER 5: SAFAIDS

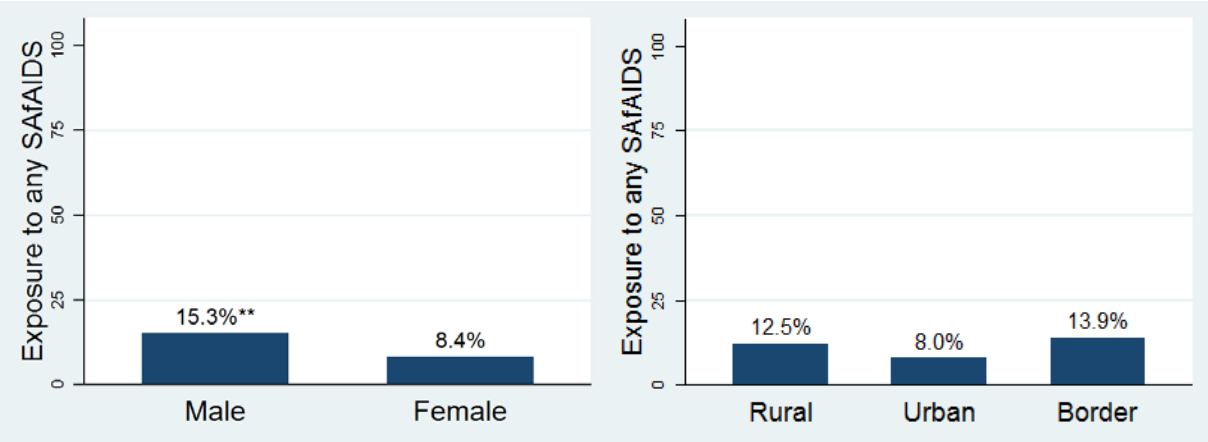
5.1 EXPOSURE MEASURES

Exposure to SAfAIDS materials and programs is measured by a composite variable that includes exposure to any of the following SAfAIDS items: SAfAIDS print materials (including toolkits, newsletters, flipcharts, posters, brochures, booklets, factsheets, how-to cards, and other documents), information about HIV and AIDS from a community based volunteer or community-based health officer, a community dialogue on HIV, gender, and culture under the theme *Changing the River's Flow*, and awareness of the *Changing the River's Flow* program. The overall percentage of individuals who report any exposure to SAfAIDS programs is 11.9%. The largest component of this exposure measure is receiving HIV and AIDS information from a community volunteer with a SAfAIDS badge (5.2%), followed by exposure to the SAfAIDS newspaper column (3.5%). There is minimal reported participation in community dialogues (0.6%) or in the *Changing the River's Flow* program (0.3%).

Exposure to SAfAIDS activities varies across gender, domain, age group, and other measures, as found in Table 43 and in Figures 22 and 23. More information on exposure to the SAfAIDS program by each of the specific SAfAIDS variables listed above can be found in Appendix C.

Figure 22 presents the results of exposure to SAfAIDS by gender. Exposure to SAfAIDS varies between men and women (15.3% of men report exposure to at least one of the SAfAIDS variables as compared with 8.4% of women). SAfAIDS exposure also varies across geographic domains; Total exposure in rural, urban and border areas is 12.5%, 8.0% and 13.9%, respectively.

Figure 22: SAfAIDS exposure by sex and domain



The sampling plan for this evaluation included a program area domain corresponding to the districts in which SAfAIDS and Lusweti focused program activities. No statistically significant differences in exposure to SAfAIDS activities were noted across program and non-program areas (10.6% as compared with 12.5%, respectively, Figure 23). Participation in a community dialogue, the *Changing the River's Flow* program and in exposure to a SAfAIDS volunteer was low even in program areas.

Figure 23: SAfAIDS exposure by program areas

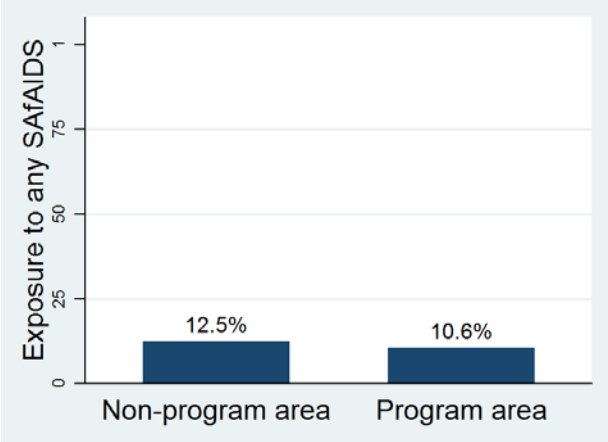


Table 43: Exposure to SAfAIDS by gender and domain

	Men N=1976	Women N=1996	Women 15-24 N=777	Border N=1332	Urban N=1301	Rural N=1339	Program Area N=2622	Total N=3972
Any SAfAIDS exposure	15.6%	8.4%	7.1%	13.9%	8.0%	12.4%	10.6%	11.9%
Know: SAfAIDS Logo	5.9%	5.4%	3.3%	5.6%	4.9%	5.9%	5.3%	5.6%
Read: SAfAIDS Newspaper column	4.9%	2.3%	1.4%	3.2%	3.1%	3.8%	2.5%	3.5%
Received/read: SAfAIDS HIV materials in past two years	1.9%	1.0%	1.0%	1.8%	1.4%	0.5%	1.1%	1.5%
- Received/read: Flipchart	33.0%	4.4%	0.0%	14.8%	28.9%	32.9%	26.7%	24.3%
- Received/read: Poster	87.7%	61.1%	60.3%	83.7%	87.1%	67.3%	56.4%	79.6%
- Received/read: Toolkit (Children and HIV Treatment Literacy)	63.2%	46.7%	38.2%	56.0%	65.8%	54.1%	54.0%	58.2%
- Received/read: How-to card	43.0%	26.1%	30.4%	23.8%	51.5%	44.4%	45.6%	37.9%
- Received/read: Newsletter	43.4%	61.1%	75.9%	33.7%	56.9%	61.5%	50.1%	48.7%
- Received/read: Fact sheet	27.0%	37.7%	30.6%	32.4%	24.1%	32.9%	37.2%	30.2%
- Received/read: ART literacy Toolkit	1.2%	0.2%	0.3%	0.7%	1.5%	0.4%	0.6%	0.7%
- Received/read: GBV toolkit	1.2%	0.6%	0.9%	0.9%	1.1%	0.8%	1.0%	0.9%
Received HIV information from CBV	8.8%	1.9%	2.0%	6.5%	2.9%	5.5%	4.1%	5.2%
Participated in community dialogue	1.3%	0.1%	0.0%	0.5%	0.7%	0.7%	0.7%	0.6%
Participated in SAfAIDS community policy dialogue	0.7%	0.2%	0.1%	0.6%	0.7%	0.2%	0.3%	0.4%
Heard of Changing the River's Flow	1.1%	0.1%	0.0%	0.6%	1.1%	0.4%	0.7%	0.6%
Has seen Changing the River's Flow Logo	1.3%	0.7%	0.7%	1.4%	1.2%	0.8%	1.3%	1.0%
Has seen Changing the River's Flow bag	1.7%	0.4%	0.9%	1.3%	0.7%	1.0%	1.0%	1.0%
Participated in Changing the River's Flow	0.5%	0.1%	0.0%	0.1%	0.6%	0.3%	0.2%	0.3%

5.2 REACH

An estimated 62,727 people know of SAfAIDS (39,572 males and 22,976 females) and 29,883 people recognize the SAfAIDS logo (15,049 men and 14,834 women). The SAfAIDS intervention with the widest reach is the community-based volunteers as 27,712 (22,441 men and 5,271 women) people received HIV information from a community based volunteer. The most read SAfAIDS materials include the SAfAIDS

newspaper column (18,644 readers), GBV toolkit (4,611), and poster (4,178). Approximately 2,175 people participated in a community dialogue organized by SAfAIDS in the past two years.

The results indicate that 3,071 people had heard of *Changing the River's Flow* but 5,437 recognized the logo and 5,451 recognized a picture of the bag. An estimated 1,676 people participated in *Changing the River's Flow* program.

5.3 RESULTS FOR GENERAL POPULATION (TOTAL, MALE, FEMALE)

This next section presents the results for exposure to SAfAIDS on health outcomes important to this evaluation. With the exception of the gender-based violence outcomes, the tables below present only significant outcomes. The full results can be found in Appendices G and H.

5.3.1 MULTIPLE PARTNERSHIPS

Exposure to SAfAIDS does not seem to positively affect key behaviors relating to multiple partnerships (Table 44). For example, 24.8% of respondents exposed to the program report having multiple partners in the past 12 months as compared with 15.4% of the unexposed group. This effect is also observed among women, for whom the difference between the exposed and unexposed is 7.9 percentage points. It is also observed that 52.7% of women exposed to SAfAIDS report receiving gifts or money in exchange for sex with their last sexual partner as compared with 37.6% of unexposed women. A lower percentage of respondents exposed to SAfAIDS disagree with the statement *most of my friends feel that men have the right to have sex with a female if they buy them gifts*, 72.4% versus 82.4%.

There is a positive treatment effect of SAfAIDS exposure on two indicators measuring community norms. A higher percentage of exposed respondents report that they often or sometimes have heard a village head or community leader discourage married men from having multiple partners (12.2 percentage point difference); this finding is confirmed in the PSM results. This difference (26.4 percentage points) is even greater among men. The PSM results also indicate that there is a positive treatment effect of SAfAIDS exposure on the percentage of respondents who report hearing community leaders discourage men from having younger sexual partners. This is also true among men, 65.4% for exposed men as compared with 54.2% of unexposed men.

Table 44: Summary of multivariate results of SAfAIDS exposure and MCP

	Total			Males		Female	
	Unexposed	Exposed	PSM	Unexposed	Exposed	Unexposed	Exposed
Exposure to Any SAfAIDS (versus none)							
Multiple partners (past 12 months)	15.4%	24.8%**	NS	28.2%	39.3%	5.9%	13.8%**
Received gifts or money in exchange for sex with last partner	30.2%	31.3%	NS	20.7%	13.3%	37.6%	52.7%*
Received gifts or money in exchange for sex with last casual partner	33.7%	38.9%	NS	23.9%	21.0%	42.2%	64.5%*
Most married men faithful to wives (%Agree)	21.4%	17.6%	-	34.8%	29.7%	9.2%	10.0%
Men have right to get sex for gifts (%Disagree)	82.4%	72.4%*	NS	74.8%	66.6%	88.6%	83.0%
Leaders speak out about risk of HIV if MP (%Strongly agree/agree)	68.6%	76.8%*	+	70.7%	87.3%**	66.5%	61.3%
Leaders discourage multiple partners (%Very often/sometimes)	42.3%	54.5%*	+	43.0%	69.5%**	41.6%	31.4%
Leaders discourage men from having younger partners (%Very often/sometimes)	48.3%	54.7%	+	54.2%	65.4%*	43.0%	42.4%
Age at first sex	18.6	19.1	+	19.3	19.8	18.2	18.5

*=p<0.05 **=p<0.01

PSM: + significant/increasing ; - significant/decreasing ;NS not significant

5.3.2 OTHER HIV RISK FACTORS

A negative treatment effect is observed for exposure to SAfAIDS for two HIV risk perception outcomes. For example, 41.1% of exposed respondents report being worried about becoming infected with HIV as compared with 48.9% of the unexposed. This difference is greater among men - 34.7% of the exposed versus 48.0% of the unexposed. It is also observed that a lower percentage of men exposed to SAfAIDS agree that they may be infected now (-6.3 percentage points). Exposed men are also less likely to know the statement *TB can't be cured if you are HIV+* is false (49.8% versus 59.9%).

Table 45: Summary of multivariate results of SAfAIDS exposure and other HIV risk factors

	Total			Males		Female	
	Unexposed	Exposed	PSM	Unexposed	Exposed	Unexposed	Exposed
Exposure to Any SAfAIDS (versus none)							
Worried about becoming HIV infected (%Worried)	48.9%	41.0%*	-	48.0%	34.7%**	49.5%	53.3%
Likely to be infected now (%Agree)	22.2%	15.8%	-	14.4%	8.2%*	29.2%	26.5%
TB can't be cured if HIV+ (%False)	59.0%	56.3%	NS	59.9%	49.8%*	58.0%	68.3%

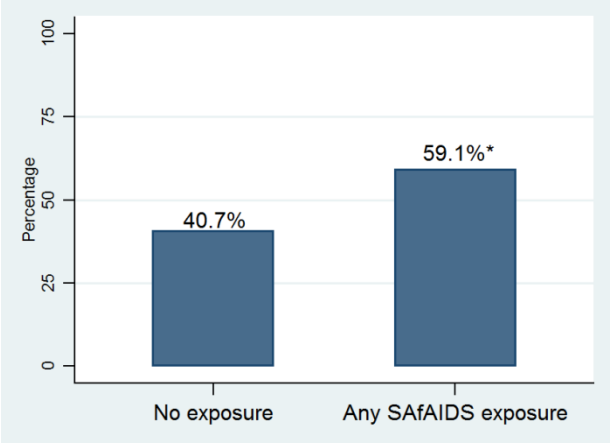
*=p<0.05 **=p<0.01

	Total			Males		Female	
	Unexposed	Exposed	PSM	Unexposed	Exposed	Unexposed	Exposed
PSM: + significant/increasing ; - significant/decreasing ;NS not significant							

5.3.3 HIV COMMUNICATION AND CONDOM USE

There are two positive and significant effects of SAfAIDS exposure on HIV communication. First, 59.1% of men exposed to SAfAIDS report that they have discussed HIV/AIDS with their children as compared with 40.7% of unexposed men; this is not significant for the total population or for women (Figure 24).

Figure 24: SAfAIDS exposure and discussing HIV/AIDS with children, men



Second, there is a 3 percentage point difference in the hypothesized direction between exposed and unexposed respondents who agree that your sex life can improve if you communicate with your partner. However, a lower percentage of exposed respondents report discussing sexual dissatisfaction with their spouse or cohabitating partner (-24 percentage point difference for the total population and -31.9 percentage point difference among men). Exposure to SAfAIDS is significantly associated with only one condom use outcome, but in the opposite of the hypothesized direction. It is observed that 46.0% of the population who report having multiple partners report using a condom at last sex with a regular partner as compared with 62.9% of the unexposed population. This finding is confirmed by the PSM results.

Table 46: Summary of multivariate results of SAfAIDS exposure and HIV communication and condom use

	Total			Males		Female	
	Unexposed	Exposed	PSM	Unexposed	Exposed	Unexposed	Exposed
Exposure to Any SAfAIDS (versus none)							
Discussed HIV/AIDS with children	52.1%	64.2%	NS	40.7%	59.1%*	57.8%	68.2%
Sex life improves with communication with partner (%Agree)	92.3%	95.6%**	NS	90.2%	94.5%	94.1%	95.6%

	Total			Males		Female	
	Unexposed	Exposed	PSM	Unexposed	Exposed	Unexposed	Exposed
Percentage who have discussed sexual dissatisfaction with spouse/regular cohabitating partner	70.7%	46.6*	NS	75.2%	43.3%**	65.4%	82.0%
Condom use at last sex with a regular partner, among those with multiple partners	62.9%	46.0%*	-	60.6%	47.6%		

*=p<0.05 **=p<0.01

PSM: + significant/increasing ; - significant/decreasing ;NS not significant

5.3.4 HIV TESTING

The PSM results indicate that there is a positive and significant treatment effect of SAfAIDS exposure on HIV testing behaviors. Although not significant in the multivariate regression, the estimates for exposed individuals are higher. It is observed that 69.4% of exposed individuals report being tested for HIV in their lifetime as compared with 66.2% of unexposed individuals. The average number of times a respondent was tested for HIV is higher among the exposed than the unexposed and this is particularly true among women, 3.7 tests as compared with 2.7. Testing in the last 12 months is also higher among exposed individuals, 54.5% versus 49.7%. These differences are not significant when examined separately by gender. However, a slightly lower percentage of individuals who have been tested for HIV and exposed to SAfAIDS received their test results.

Table 47: Summary of multivariate results of SAfAIDS exposure and HIV testing

	Total			Males		Female	
	Unexposed	Exposed	PSM	Unexposed	Exposed	Unexposed	Exposed
Exposure to Any SAfAIDS (versus none)							
Ever tested for HIV	66.2%	69.4%	+	52.2%	54.3%	78.7%	83.3%
HIV test in the last 12 months	49.7%	54.5%	+	39.8%	46.0%	58.4%	63.0%
Received results of most recent HIV test	97.7%	94.9%*	NS	96.8%	92.2%*	98.1%	97.7%
Leaders encourage HIV testing (%Strongly agree/agree)	65.6%	75.2%*	+	67.0%	80.2%**	64.3%	66.8%
Number of times tested for HIV	2.1	2.7*	+	1.5	1.8	2.7	3.7**

*=p<0.05 **=p<0.01

PSM: + significant/increasing ; - significant/decreasing ;NS not significant

There is a 10 percentage point difference between the exposed and unexposed in the percentage of respondents who agree or strongly agree that leaders in their communities encourage people to get

tested for HIV. This difference, 13.2 percentage points, is higher among men but not significant among women (Figure 25).

Figure 25: SAfAIDS exposure on perceptions that leaders encourage people to get tested for HIV

5.3.5 HIV TREATMENT

Exposure to SAfAIDS has a positive effect on several outcomes related to HIV treatment including knowledge of MCT, community norms, and receiving support while on ARVs. The increased knowledge about ARVs and prevention of MCT is particularly strong among men. For example, 79.6% of exposed know that ARVs can prevent MCT during pregnancy as compared with 64.5% of unexposed men. The difference is 10 percentage points for knowledge that ARVs prevent MCT during childbirth and 15 percentage points for knowledge that ARVs can also prevent HIV transmission during breastfeeding. Further, people exposed to SAfAIDS are more likely to say that leaders in their community encourage HIV positive people to get treatment, 78.3% versus 66.7%; again, this difference is greater for men, among whom 84.1% of exposed men agree with this statement as compared with 67.9% of the unexposed. According to the PSM results, exposed individuals are more likely to report having taken care of someone who was on ARTs in the past, but a lower percentage of exposed respondents report a willingness to care for someone on ARTs, 82.1% versus 91.4%. This could be because people who have taken care for someone in the past know how difficult it can be and that may influence their willingness to do so again. Finally, there is a positive treatment effect on having received support from an ARV treatment buddy or community volunteer among women who have taken ARVS, 65.8% versus 43.3%.

Table 48: Summary of multivariate results of SAfAIDS exposure and HIV treatment

	Total			Males		Female	
	Unexposed	Exposed	PSM	Unexposed	Exposed	Unexposed	Exposed
Exposure to Any SAfAIDS (versus none)							
Cared for someone on ART	19.0%	21.1%	+	13.0%	16.9%	24.2%	23.7%
Willing to care for someone on ART	91.4%	82.1%*	-	88.4%	71.7%**	93.8%	94.8%
ARVs prevent MCT during pregnancy	76.4%	82.3%	+	64.5%	79.6%**	86.7%	80.2%
ARVs prevent MCT during childbirth	72.5%	80.2%*	NS	57.6%	78.0%**	85.1%	78.8%
ARVs prevent MCT during breastfeeding	69.9%	74.0%	NS	55.5%	70.8%**	82.3%	72.3%
Leaders encourage HIV treatment (%Strongly agree/agree)	66.8%	78.3%**	+	67.9%	84.1%**	65.7%	68.9%
Received support from an ARV treatment buddy or CBV, if taken ARVs	49.2%	58.9%	NS			43.3%	65.8%*

*=p<0.05 **=p<0.01

PSM: + significant/increasing ; - significant/decreasing ;NS not significant

5.3.6 HIV STIGMA

Exposure to SAfAIDS yields some mixed results when it comes to HIV stigma related outcomes. On the one hand, women exposed to SAfAIDS are more likely to disagree that your life is over if you are HIV+ (97.3% versus 93.9%). On the other, exposed women are less likely to disagree with the statement that telling people you are HIV + does not help (50.1% exposed versus 65.1% unexposed). There are no significant results for these outcomes for the total population or among men. But it is observed that there is 6 percentage point difference, in the negative direction, between the exposed and unexposed on the percentage who disagree with the statement *HV/AIDS is a punishment for sinning*. This difference is 8 percentage points among men, also in the negative direction. Despite these results, there is a positive treatment effect of exposure to SAfAIDS on community support of people living with HIV. It is observed that 68.2% of respondents exposed agree or strongly agree that people in their communities join together to help PLHIV compared with 59.8% of the unexposed. PSM analysis confirms these results for the total population. This treatment effect is also observed among men, 71.3% versus 60.6%.

Table 49: Summary of multivariate results of SAfAIDS exposure and HIV stigma

	Total			Males		Female	
	Unexposed	Exposed	PSM	Unexposed	Exposed	Unexposed	Exposed
Exposure to Any SAfAIDS (versus none)							
When learn that you are HIV+, life is over (%Disagree)	94.3%	95.6%	NS	94.5%	94.8%	93.9%	97.3%*
Telling people you are HIV+ doesn't help (%Disagree)	65.0%	62.2%	NS	65.0%	68.8%	65.1%	50.1%*
HIV is punishment for sinning (%Disagree)	81.7%	75.2%**	NS	82.4%	74.1%*	81.0%	77.2%
People in the community join together to help PLHIV (%Strongly agree/agree)	59.8%	68.2%*	+	60.6%	71.3%*	59.1%	63.1%

*=p<0.05 **=p<0.01

PSM: + significant/increasing ; - significant/decreasing ;NS not significant

5.3.7 FORCED SEX AND PHYSICAL VIOLENCE

As was described previously in the Lusweti section of this report, the prevalence of forced sex is low in Swaziland and there are not significant differences in the proportion who report forced in the last 12 months between those exposed to SAfAIDS versus those who have not been exposed. The same can be said for reports of experiencing physical violence in the last 12 months. The low sample size does not allow for reporting of forced sex to be included in the multivariate or PSM analysis. There is a positive effect of exposure on reporting physical violence to anyone, 85.3% for the exposed versus 64.1% for the unexposed (Table 50). The differences are not significant when examined by the type of person to whom this violence was reported, but it is encouraging that more exposed individuals reported it. Finally, while not significant among women, the PSM results indicate a positive effect on the percentage of respondents who agree or strongly agree that leaders in their communities speak out against gender-based violence. This is also true among men where 79.5% of the exposed agree with this compared with 69.8% of the unexposed.

Table 50: Summary of multivariate results of SAfAIDS exposure and HIV stigma

	Total			Males		Female	
	Unexposed	Exposed	PSM	Unexposed	Exposed	Unexposed	Exposed
Exposure to Any SAfAIDS (versus none)							
Forced sex in the last 12 months	2.8%	4.9%	NS	1.3%	2.5%	4.1%	7.6%
Physical GBV in the last 12 months	6.3%	6.3%	NS	4.1%	5.7%	8.3%	4.9%
Reported physical violence to authorities	64.1%	85.3%*	+			63.6%	86.2%

	Total			Males		Female	
	Unexposed	Exposed	PSM	Unexposed	Exposed	Unexposed	Exposed
Report violence to family, friend, or community member	74.1%	68.7%	NS				
Report violence to police or authority	40.5%	36.7%	NS				
Leaders speak out against GBV (%Strongly agree/agree)	65.8%	69.2%	+	69.8%	79.5%*	62.1%	56.4%

*=p<0.05 **=p<0.01

PSM: + significant/increasing ; - significant/decreasing ;NS not significant

5.4 RESULTS FOR VULNERABLE POPULATIONS

5.4.1 YOUNG WOMEN AGED 15-24

The results found for the sub-sample of females aged 15 to 24 years are shown in Table 51. There are numerous observed associations between exposure to SAfAIDS and variables related to having multiple partners; however, the majority of these associations are in discouraging directions. SAfAIDS is positively associated with having the knowledge that multiple sexual partners increase HIV risk. But, 26.4% of exposed respondents who are also sexually experienced report that they have had multiple partners in the last year, as compared with 8.1% of unexposed and sexually experienced respondents. Similarly, 15.9% of the exposed report having more than one partner in the last three months, as compared with 5.6% of the unexposed. Finally, those exposed are more likely to believe that their last partner had other sexual partners (84.4% versus 51.4%).

The only significant association found related to other HIV risk factors and SAfAIDS materials was also in an unexpected direction: 76.7% of the exposed population know where to get information about HIV/AIDS as compared with 91.6% of the unexposed population. Similarly, regarding condom use, the unexposed are actually more likely to agree that condom use in marriage is accepted than those exposed to SAfAIDS. The only other significantly associated condom use variable is encouraging, where 57.9% of those exposed agree that women can ask a casual partner to wear a condom, compared to 39.1% of the unexposed.

No statistically significant associations exist between SAfAIDS and HIV testing. However, there are two associations with HIV treatment. Surprisingly, for this population these two variables are not in the desirable direction. Those exposed are less likely to agree that ARVs prevent MCT during childbirth (65.5% versus 79.7%) and that people on ART have to stay on treatment for the rest of their lives (76.9% versus 89.5%), suggesting that the exposed young women are not as knowledgeable about HIV

treatment as the unexposed women. Finally, there are no significant associations between SAfAIDS and GBV or HIV stigma variables.

Table 51: Summary of multivariate results for SAfAIDS exposure and health outcomes-women 15-24

SAfAIDS	Unexposed	Exposed
Multiple Partners		
Multiple partners (past 12 months)	8.1%	26.4%**
10+ year age difference between respondent and last sexual partner	9.9%	34.8%**
Thinks that last partner had other sexual partners	51.4%	84.4%**
Gave gifts or money in exchange for sex with last partner, if casual	18.8%	39.9%**
Multiple sexual partners increase HIV risk (%True)	91.2%	99.0%**
Other HIV Risk Factors		
Knows where to get information about HIV/AIDS	91.6%	76.7%*
Condom Use		
Condom use at last sex with regular partner	66.1%	54.7%
Condom use in marriage accepted (%Strongly agree/agree)	69.2%	48.0%*
Women can ask casual partner to use condom (%Strongly agree/agree)	39.1%	57.9%*
HIV Testing		
Ever tested for HIV	64.0%	65.6%
Tested for HIV in last 12 months	55.8%	62.2%
HIV Treatment		
ARVs prevent MCT during childbirth	79.7%	65.5%*
People on ART have to stay on treatment for rest of lives	89.5%	76.9%*
GBV		
Forced sex in the last 12 months	2.7%	6.3%
Physical GBV in the last 12 months	8.3%	3.7%
Leaders speak out against GBV (%Strongly agree/agree)	59.5%	53.9%
*=p<0.05 **=p<0.01		
PSM: + significant/increasing ; - significant/decreasing ;NS not significant		

5.4.2 BORDER POPULATIONS

Multiple associations between exposure to SAfAIDS and variables related to having multiple partners are observed (Table 52). SAfAIDS is found to have positive associations with having the knowledge that multiple sexual partners increase HIV risk (99.3% versus 94.2%), reporting that leaders discourage multiple partners (56.5% versus 42.8%), and an increase in age at first sex (19.5 versus 18.5). However, discouraging effects were found, such as 35.9% of exposed respondents who are also sexually experienced reporting that they have had multiple partners in the last year, as compared with 14.5% of unexposed and sexually experienced respondents. Similarly, 23.3% of the exposed reported having

more than one partner in the last three months, as compared with 9.1% of the unexposed. Exposed individuals are more likely to report dissatisfaction when having sex with their spouse or regular cohabitating partner (30.0% versus 15.8%).

There are no statistically significant associations between exposure to SAfAIDS and condom use; however there are three significant effects related to HIV testing and treatment. Those exposed are more likely to agree that pregnant women should test for HIV. The exposed are also more likely to report that their leaders encourage HIV treatment. But surprisingly, 83.4% of the exposed are willing to care for someone on ART, as compared with 94.4% of the unexposed.

Related to HIV stigma, those exposed to SAfAIDS are significantly less likely to disagree with the statement that HIV is a punishment for sinning than those who were unexposed. Only one gender-based violence variable is found to be statistically significant within the border population; 73.4% of the exposed population agree that their leaders speak out against GBV, while just 62.6% of the unexposed agree.

Table 52: Summary of multivariate results for SAfAIDS exposure and health outcomes-border

	Unexposed	Exposed
Multiple Partners		
Multiple partners (past 12 months)	14.5%	35.9%**
Multiple partners (past month)	4.5%	4.8%
More than one partner within 3 months period (past 12 months)	9.1%	23.3%**
Reports currently (3mths) having more than one partner	7.4%	17.0%*
Multiple sexual partners increase HIV risk (%True)	94.2%	99.3%**
Leaders discourage multiple partners (%Very often/sometimes)	42.8%	56.5%*
Age at first sex	18.5	19.5*
HIV Communication		
Percentage who are dissatisfied when having sex with spouse/regular cohabitating	15.8%	30.0%*
Condom Use		
Condom use at last sex with regular partner	51.2%	61.2%
Condom at last sex among those with multiple partners	70.7%	65.2%
HIV testing		
Ever tested for HIV	67.8%	71.6%
HIV test in the last 12 months	50.5%	53.9%
Pregnant woman should test for HIV (%True)	96.6%	99.2%*
HIV Treatment		
Willing to care for someone on ART	94.4%	83.4%**
Leaders encourage HIV treatment (%Strongly agree/agree)	58.3%	70.4%*
HIV Stigma		
HIV is punishment for sinning (%Disagree)	81.1%	68.4%**
GBV		

	Unexposed	Exposed
Physical GBV in the last 12 months	6.7%	7.3%
Leaders speak out against GBV (%Strongly agree/agree)	62.6%	73.4%*

*=p<0.05 **=p<0.01

PSM: + significant/increasing ; - significant/decreasing ;NS not significant

CHAPTER 6: MARGINAL AND CUMULATIVE EFFECTS

As noted by West (2010), a key issue in this evaluation is distinguishing the impact of the current three-year program of partner activities from prior program activities and from the programs of other donors. This is referred to by West as the marginal impact, "the additional reach and effect of further rounds of BCC in an environment where multiple sources of information exist and where many exposed to BCC programs may have had previous exposure" (West, p. 7). Marginal impact is held to be distinct from cumulative impact, the effects of exposure to program activities over multiple rounds of funding.

Ideally, the marginal impact of the program would be calculated as the change in mean outcomes from baseline to endline for those exposed to the program relative to those not exposed, controlling at the same time for exposure to other programs. This would address the issue of cumulative exposure, as the influence of previous programs would already be determined in baseline outcomes, and changes across time for sampled respondents would reflect only the effects of recent programs (using suitable controls for other programs).

However, the baseline data collected in 2007 had several drawbacks which limited their usefulness, namely insufficient comparability - at least for many of the indicators being examined here – and questions about overall data quality. Further, many of the key data – including measures of exposure to other programs – were collected using open-ended responses, which had not been fully coded. Hence, we sought a compromise that attempted to distinguish between current exposure and prior exposure using this single wave of data.

The compromise involved inserting several questions into the survey instrument about the timing of first exposure to Lusweti and SAfAIDS interventions. Specifically, respondents in Swaziland were asked:

- If they had ever heard of Lusweti and, if so, when they first heard of it;
- If they had ever seen the Lusweti logo and, if so, when they first saw it;
- If they had ever listened to a Lusweti radio drama and, if so, when they first heard it;
- If they had ever watched a Lusweti television show and, if so, when they first saw it;
- If they had ever seen the SAfAIDS logo and, if so, when they first saw it;
- If they had ever read informational materials on HIV&AIDS produced by SAfAIDS and, if so, when

Coded responses included time periods that distinguished between recent exposure (either in the past year or past 12-36 months) from earlier exposure (more than 36 months ago) and from no exposure.

Measures of intensity of exposure (e.g., number of episodes watched or radio programs listened to) during each of these time periods were not included in the questionnaire as they were considered to be too prone to error and recall bias. For similar reasons, a timeline of exposure (e.g., "Were you exposed to a Lusweti radio drama in 2008? 2009? 2010? 2011?") was also omitted.

To address the issue of marginal versus cumulative effect, we distinguish between two types of marginal effects: (1) the marginal effect of exposure to program interventions for those exposed *only during the most recent three years* of program activities (relative to those not exposed at all) and (2) the marginal effect for those first exposed *prior to the most recent three years* netting out the effects of previous exposure.

For those exposed only during the most recent three years, our counterfactual is straightforward. We use as a comparison group the sample of respondents not exposed to program activities during the current period (nor in prior periods), and then examine differences in mean outcomes through bivariate and multivariate analyses that control for observable differences in these two groups.

For those with prior exposure, the comparison is less straightforward. Ideally we would use as the counterfactual the group of respondents who report exposure to program activities in previous periods but not the current period. This group – it is assumed – represents what would have happened to those who continued to be exposed had they not in fact been exposed further, i.e., their baseline outcomes. The pattern of exposure to OneLove programs in Swaziland disallows for this comparison as most respondents who were exposed previously continued to be exposed during the current period. Therefore, only the cumulatively exposed group (respondents exposed previously and currently) can be compared to the unexposed group, which does not allow for the effects of previous exposure to be teased out. Where relevant, it is determined if the magnitude of the effect of recent exposure is significantly different than the magnitude of the effect of cumulative exposure, which would indicate an additive effect of previous exposure.

The marginal and cumulative analysis focuses on exposure to Lusweti/OneLove radio and television programs. The samples that correspond to exposure to the SAfAIDS logo and informational materials are too small to conduct the analysis.

As described in the Lusweti/OneLove section above, a person was characterized as having current exposure to Lusweti radio activities if they reported listening to either the OneLove radio drama, OneLove talk show, or Champions advertisements. Prior exposure is determined from the question

about whether or not a person heard a Lusweti radio drama prior to the current round of activities. Current exposure to Lusweti/OneLove television programs was defined as exposure to any of the Love Stories film series, Untold drama series, Meet Joe advertisements, or Champions advertisements. Prior exposure is determined from the question about whether or not a person had watched a Lusweti television show. In both bivariate and multivariate analyses, we look at the differences in mean outcomes for three groups:

(1) Never Exposed: Those never exposed to Lusweti / OneLove radio or televisions programs in either the previous 36 months or earlier;
(2) Recently Exposed: Those who report exposure to Lusweti/OneLove radio or television only in the most recent three years but not prior;
(3) Previously Exposed: Those exposed to Lusweti radio drama or the Lusweti television show prior to three years ago who were also exposed during the current period. Ideally, this third category would be compared with a fourth category of individuals who were exposed previously, but no longer exposed during the current project period. The exposure distribution for the Swaziland data does not allow for this disaggregation (only 69 respondents had only been exposed previously to radio. Only 35 respondents had only been previously exposed to the television show. These observations were not included in the marginal and cumulative analysis)

For simplicity, the analysis is principally focused on whether there are statistically significant differences in mean outcomes (adjusted and unadjusted) between each of the exposed groups (based on the timing of exposure) relative to the never exposed group. Differences between the recently exposed (Group 2) and the never exposed (Group 1) would be an indication of significant recent marginal effects. Differences between those exposed during both the previous and current period (Group 3) and the never exposed (Group 1) would be indicative of significant cumulative effects. We then compare the effects for the recently exposed (Group 2) and the cumulatively exposed (Group 3). If they are similar, then that would be an indication that exposure in the most recent period would have had little impact amongst those previously exposed (except to the extent that current exposure prevented deterioration of effects). If mean outcomes for the cumulatively exposed (Group 3) are significantly better than those for the respondents exposed only in the current period (Group 2), then that would tend to indicate a significant contribution of the program even for those previously exposed.

The standard set of characteristics of respondents are controlled for in the multivariate probit regression models, as well as contemporaneous exposure to other programs. It is hypothesized that:

(1) The effect of cumulative exposure for the cumulatively exposed (Group 3) will exceed the marginal effect for the recently exposed (Group 2), reflecting the additive effect of multiple Lusweti programs across time.

(2) The marginal effect for the recently exposed (Group 2) will exceed that for the cumulatively exposed (Group 3), reflecting diminishing marginal returns for the latter group.

6.1 MULTIPLE AND CONCURRENT PARTNERSHIPS

The results for all of the outcomes can be found in Appendix I; the tables below present significant results as well as the key program outcomes outlined above. The results of radio and television exposure are presented for each set of health outcomes. There appears to be a significant cumulative effect of exposure to either radio or television during both time periods on having multiple partners in the past 12 months but no significant effects among those recently exposed. The differences present significant adjusted effects in the hypothesized direction; adjusted effects are -6.2 percentage points for radio and -7.8 percentage points for television. No significant differences are evident for having multiple partners in the last month or for currently reporting concurrent sexual partners. Significant cumulative exposure to radio program is also observed for the outcome *thinks that last partner had other sexual partners* (43.1% exposed in both time periods versus 52.5% for those never exposed to a radio program). Though significant effects are evident for both the recently exposed and the cumulatively exposed groups in terms of those who believe that leaders in their communities discourage men from having younger sexual partners, no significant differences are apparent between the magnitude of effect of those recently exposed and those cumulatively exposed (p=.0.467, not shown). This could either indicate that there is no additional benefit of recent exposure for those who were previously exposed, or that an effect of the program can be found as long as recent exposure has occurred. Recent radio exposure significantly affects two outcomes that relate to the actions of community leaders: speaking out about the increased risk of HIV from having multiple sexual partners (6.2 percentage point difference) and discouraging multiple partners (6.6 percentage point difference). There is also a significant marginal effect on the number of lifetime partners in the opposite direction to that hypothesized; respondents recently exposed have a higher average number of lifetime partners.

Table 53: Marginal and cumulative effects of radio and television programs on MCP

	Never Exposed	Recently Exposed	Exposed in both
Radio			
Multiple partners (past 12 months)	18.9%	16.7%	12.7%*
Multiple partners (past month)	7.1%	4.9%	4.0%
Reports currently having more than one partner	11.3%	7.5%	8.5%
Thinks that last partner had other sexual partners	52.5%	46.6%	43.1%*
Leaders speak out about risk of HIV if MP (%Strongly agree/agree)	64.4%	70.6%**	71.7%
Leaders discourage multiple partners (%Very often/sometimes)	38.8%	45.4%*	45.6%
Leaders discourage men from having younger partners (%Very often/sometimes)	42.8%	50.5%*	53.4%*
Number of lifetime partners	2.8	3.5*	3.3
Television			
Multiple partners (past 12 months)	15.6%	18.3%	7.8%*
Multiple partners (past month)	4.4%	6.7%	1.7%
Reports currently having more than one partner	7.3%	10.0%	5.0%
Agrees that wife/cohabitating partner has another partner	2.5%	4.2%	14.4%**
Agrees that husband/cohabitating partner has another wife	17.0%	21.4%	36.4%*
Gave gifts or money in exchange for sex with last regular partner	14.3%	18.0%	30.4%**
Men with many women are real men (%Disagree)	92.5%	96.3%*	98.4%**
Men have right to get sex for gifts (%Disagree)	77.0%	84.1%**	89.3%*

*=p<0.05 **=p<0.01

In terms of television exposure, there are two significant cumulative effects but again opposite to the hypothesized direction. Respondents exposed in both time periods are more likely to suspect that their husband or wife has another sexual partner than those who were never exposed to a television program. The difference is greater among women; 36.4% exposed during both time periods suspect their husband has another partner as compared with 17.0% of unexposed women. Significant effects are observed among the recently and cumulatively exposed on the percentage of respondents who disagree with the statements *men with many women are real men* and *men have the right to get sex for gifts*. However, no significant differences are evident between the magnitude of effect of those recently exposed and those cumulatively exposed (p=0.142 and p=0.202, respectively)

6.2 OTHER HIV RISK FACTORS

Recent and cumulative exposures to radio and television have significant effects on different health outcomes that fall under the grouping of other HIV risk factors. For example, significant cumulative and recent effects are observed for radio exposure on outcomes related to HIV risk perception. Both the

recently exposed and cumulatively exposed are more likely to report being worried about becoming HIV infected (5.8 percentage points higher for the recently exposed and 9.3 percentage points for the cumulatively exposed) and suspecting that they are currently infected with HIV (7.4 percentage points higher among the recently exposed and 10.6 percentage points among those exposed during both time periods). Again, no significant differences are evident in the magnitude of effect of those recently exposed and those cumulatively exposed. A significant effect of cumulative exposure is observed in the percentage of respondents who know that *STIs decrease HIV infection* is a false statement, 95.1% among those cumulatively exposed versus 89.3% of those never exposed.

Table 54: Marginal and cumulative effects of radio and television programs on other HIV risk factors

	Never Exposed	Recently Exposed	Exposed in both
Radio			
Worried about becoming HIV infected (%Worried)	42.8%	48.6%*	53.1%*
Likely to be infected now (%Agree)	15.5%	22.9%**	26.1%**
STIs decrease HIV infection (%False)	89.3%	92.6%	95.1%*
Television			
TB can't be cured if HIV+ (%False)	62.8%	53.7%*	51.5%*
Knows where to get information about HIV/AIDS	87.7%	95.1%**	96.9%**
*=p<0.05 **=p<0.01			

Cumulative and recent television exposures are significant for two outcomes. It is hypothesized that individuals exposed at either time periods would have higher levels of knowledge when it comes to HIV risk factors; however, it is observed that a lower percentage of respondents exposed at either time period knew that *TB can't be cured if you are HIV+* is a false statement. In fact, the percentage who know this is false is lowest among the cumulatively exposed (51.5%, versus 53.7% for recently exposed and 62.8% for those never exposed). However, the effect for knowing where to get information about HIV/AIDS is in the hypothesized direction and the difference is 7.4 percentage points for those recently exposed and 9.3 percentage points for those exposed during both time periods.

6.3 CONDOM USE

There are significant cumulative effects for both radio and television on two outcomes that measure community norms regarding condom use, although there is no effect on condom use behaviors (Table 55). Respondents cumulatively exposed to radio and television are more likely to agree that condom use is accepted in marriage and that a woman can ask a regular partner to use a condom. For exposure to radio, the differences for both outcomes is almost ten percentage points between those exposed in both time periods and those who have never been exposed.

Table 55: Marginal and cumulative effects of radio and television programs on condom use

	Never Exposed	Recently Exposed	Exposed in both
Radio			
Condom use at last sex with regular partner	57.2%	59.0%	66.0%
Condom use at last sex among those with multiple partners	74.7%	74.9%	78.8%
Condom use in marriage accepted (%Strongly agree/agree)	71.4%	73.5%	79.9%*
Women can ask regular partner to use condom (%Strongly agree/agree)	70.3%	71.0%	80.0%*
Television			
Condom use at last sex with regular partner	58.9%	59.6%	60.8%
Condom use at last sex among those with multiple partners	75.0%	74.8%	81.4%
Always uses condom with most recent partner	24.9%	29.4%	14.8%*
Condom use in marriage accepted (%Strongly agree/agree)	69.9%	76.2%*	84.1%**
Women can ask regular partner to use condom (%Strongly agree/agree)	67.7%	74.6%*	83.4%*

*=p<0.05 **=p<0.01

For television exposure, there are significant cumulative and marginal effects for both of the acceptability of condom use in marriage and women asking their regular partners to use a condom. For example, 76.2% of the recently exposed and 84.1% of those exposed in both time periods agree that condom use in marriage is accepted as compared with 69.9% for those who were never exposed. The magnitude of effect between those recently exposed and those exposed at both time periods was found to be significantly different (p= 0.024), indicating that there are additive effects of previous exposure to the program, beyond the marginal effects of recent exposure. A similar pattern is observed for the percentage that agree that women can ask a regular partner to use a condom; the difference between those cumulatively exposed and those never exposed is 15.6 percentage points and the difference between those cumulatively exposed and the recently exposed is 8.8 percentage points. This represents a statistically significant difference (p=0.0306). There is one significant cumulative effect but opposite of the hypothesize direction; 14.8% of respondents exposed during both time periods report always or usually using a condom with their most recent partner as compared with 24.9% of the respondents who were never exposed.

6.4 HIV COMMUNICATION

Cumulative exposure to radio has a significant effect on increased communication about HIV (Table 56). The difference among those with dual exposure is 14.1 percentage points higher than among those who

have never been exposed when it comes to discussing HIV with friends. A similar pattern, although the difference is not as great, is observed for the outcome *discussed HIV/AIDS with spouse, children, and or friends,* 91.2% compared with 81%. Significant cumulative and recent effects are observed on the percentage of respondents who agree that sex life improves with communication with your partner but the difference between recent and cumulative exposure is not significant (p=0.654).

Table 56: Marginal and cumulative effects of radio and television on HIV communication

	Never Exposed	Recently Exposed	Exposed in both
Radio			
Discussed HIV/AIDS with friends	74.4%	76.4%	88.5%**
Discussed HIV/AIDS with spouse, children, and/or friends	81.0%	82.9%	92.0%**
Sex life improves with communication with partner (%Agree)	90.0%	93.7%*	94.4%*
Television			
Percentage who have discussed sexual satisfaction with spouse/regular cohabitating partner	54.7%	66.9%*	74.8%*
*=p<0.05 **=p<0.01			

Only one outcome is significant for recent and cumulative television exposure. Respondents exposed are more likely to report having discussions with their spouse or cohabitating partner about sexual satisfaction than respondents who were never exposed. The difference is 12 percentage points higher for those who are recently exposed and 20 percentage points higher among those who were exposed during both time periods.

6.5 HIV TESTING

Several significant marginal effects are observed from exposure to Lusweti programs on HIV testing behaviors. People recently exposed to radio are more likely to have been tested for HIV in the last 12 months; this difference is 10 percentage points. Knowledge that the only way to know your HIV status is through a blood test is high in Swaziland (above 96% for all exposure groups) but there is still a significant cumulative effect. There is also a significant marginal effect of the percentage of respondents who agree that leaders in their communities encourage HIV testing, 67.9% versus 61.8% among the unexposed.

Table 57: Marginal and cumulative effects of radio and television programs on HIV testing

	Never Exposed	Recently Exposed	Exposed in both
Radio			
Ever tested for HIV	66.0%	65.8%	68.3%
HIV test in the last 12 months	42.1%	52.4%**	50.3%
Only way to know status is by blood test (%Agree)	96.9%	98.5%	99.4%*
Leaders encourage HIV testing (%Strongly agree/agree)	61.8%	67.9%*	68.4%
Television			
Ever tested for HIV	63.2%	69.9%**	67.4%
HIV test in the last 12 months	44.6%	55.9%**	58.5%
Received results of most recent HIV test	97.2%	97.7%	99.0%
Pregnant woman should test for HIV (%True)	94.4%	94.7%	98.3%*
It is important to know your HIV status (%Agree)	96.7%	98.6%**	98.9%*
Leaders encourage HIV testing (%Strongly agree/agree)	68.8%	63.1%*	69.8%

As was seen above, the marginal and cumulative results indicate that there is a marginal effect on ever being tested for HIV and having been tested for HIV in the last 12 months. The difference is 6 percentage points for ever being tested. This effect - 11 percentage points – is larger for being tested in the last 12 months. A negative but significant marginal effect is observed in the percentage of respondents who agree that leaders encourage HIV testing; 63.1% of recently exposed respondents agree with this statement as compared with 68.8% of never exposed respondents. Again, a high percentage of all respondents agree that it is important to know your HIV status and to know that a pregnant woman should be tested for HIV, but the difference (two percentage points and almost four percentage points, respectively) between the cumulatively exposed and the never exposed is still significant.

6.6 HIV TREATMENT

Significant cumulative and marginal effects of radio exposure are observed for willingness to care for someone on ART. The adjusted effects between recently exposed and the never exposed group is 6.2 percentage points and 10 percentage points between the cumulative exposed and the never exposed. However, there is no significant difference between the recently exposed and the cumulatively exposed (p=0.092). Significant cumulative and marginal effects are found for knowing that ARVs prevent MCT during childbirth (67.7% never exposed, 75.3% recently exposed, and 77.1% exposed in both periods) but again the difference between recent and dual exposure is not significant. A significant marginal effect is observed on knowing that ARVS can prevent MCT during breastfeeding (6 percentage point difference between recently exposed and the unexposed). There is a significant cumulative effect on receiving support from an ARV treatment buddy but this indicator is only relevant to respondents who have taken ARVs (299 in this sample) so caution should be used when interpreting this result.

Table 58: Marginal and cumulative effects of radio and television programs on HIV treatment

	Never Exposed	Recently Exposed	Exposed in both
Radio			
Willing to care for someone on ART	85.3%	91.5%**	95.0%**
ARVs prevent MCT during childbirth	67.7%	75.3%*	77.1%**
ARVs prevent MCT during breastfeeding	65.9%	71.9%*	74.2%
Received support from an ARV treatment buddy or CBV, if taken ARVs	45.1%	46.1%	78.1%*
Television			
Willing to care for someone on ART	88.7%	91.4%	95.9%*
PLHIV does not need to use condoms because cannot transmit HIV (% False)	94.1%	94.0%	86.7%**
ARVs prevent MCT during pregnancy	73.8%	81.4%*	78.2%
People on ART have to stay on treatment for rest of lives	93.6%	90.6%*	96.5%
Participated in a PMTCT program	32.6%	18.0%**	15.5%**

*=p<0.05 **=p<0.01

The marginal and cumulative effects analysis for television exposure resulted in some mixed findings, particularly for knowledge outcomes. As with the radio analysis described above, a significant cumulative effect is observed on willingness to care for someone on ART (95.9% versus 88.7%). However, a significant negative effect is also found among those cumulatively exposed and knowing that *PLHIV do not need to use condoms because they can no longer transmit HIV* is false; the adjusted proportion for respondents exposed during both time periods is 7 percentage points lower than the adjusted proportion of those who were never exposed. It is also observed that 90.6% of the recently exposed know that people on ART have to stay on treatment for the rest of their lives as compared with 93.6% of those never exposed. However, a higher percentage (7.6 percentage points) of recently exposed respondents know that ARVs prevent MCT during pregnancy. Finally, women exposed recently and in both periods are less likely to report having participated in a PMTCT program when they were pregnant (17.9%, 15.5%, and 32.6%, respectively). The difference between the recently exposed and the cumulatively exposed is not significant.

6.7 HIV STIGMA

Cumulative exposure to both radio and television programs appears to have a significant effect on the percentage of respondents who disagree with the statement that only promiscuous people get HIV (4.5 percentage points for radio exposure and 9.7 percentage points for television exposure). The adjusted percentages for those who disagree that learning you are HIV positive means your life is over are 91.7% among those unexposed, 94.9% among those recently exposed, and 96.1% among those cumulatively exposed. These adjusted proportions are significant when making comparisons between the exposed

groups against the unexposed group, however, there is no significant difference between the recently exposed and the cumulatively exposed

Table 59: Marginal and cumulative effects of radio and television programs on HIV stigma

	Never Exposed	Recently Exposed	Exposed in both
Radio			
When learn that you are HIV+, life is over (%Disagree)	91.7%	94.9%**	96.1%**
Only promiscuous people get HIV (%Disagree)	76.8%	77.1%	88.2%**
Television			
Telling people you are HIV+ doesn't help (%Disagree)	69.5%	59.8%**	52.3%*
Only promiscuous people get HIV (%Disagree)	77.5%	78.4%	87.2%*
*=p<0.05 **=p<0.01			

Finally, there is a significant cumulative and marginal effect in opposite of the hypothesized direction. It is expected the stigma-related indicators would improve with exposure to the various interventions. However, it is observed that 59.8% of the recently exposed and 52.2% of the cumulatively exposed disagree that telling people you are HIV positive does not help as compared with 69.5% of respondents who were never exposed. The difference between the recently exposed and those exposed in both time periods is not significant (p=0.254).

6.8 FORCED SEX AND PHYSICAL VIOLENCE

Only two outcomes were found to be significant in both of the marginal and cumulative analysis. A marginal effect of recent exposure to a radio intervention is evident for the outcome capturing whether respondents agree with the statement *Leaders speak out against gender-based violence,* 69.3% of the recently exposed compared with 59.6% agree with this statement. No other significant marginal or cumulative effects of radio exposure were found on the other forced sex and physical violence outcomes.

Table 60: Marginal and cumulative effects of radio and television programs on forced-sex and physical violence

	Never Exposed	Recently Exposed	Exposed in both
Radio			
Forced sex in the last 12 months	2.9%	2.7%	4.5%
Physical GBV in the last 12 months	6.2%	5.8%	7.8%
Reported physical violence to authorities	68.5%	63.6%	74.0%
Report violence to family, friend, or community member	68.0%	76.0%	72.9%
Report violence to police or authority	39.1%	35.6%	52.8%

	Never Exposed	Recently Exposed	Exposed in both
Leaders speak out against GBV (%Strongly agree/agree)	59.60%	69.3%**	63.10%
Television			
Forced sex in the last 12 months	2.00%	4.2%*	6.0%*
Physical GBV in the last 12 months	5.4%	7.1%	8.5%
Reported physical violence to authorities	59.6%	75.3%	52.4%
Report violence to family, friend, or community member	72.5%	76.3%	49.9%
Report violence to police or authority	46.6%	33.3%	55.0%
Leaders speak out against GBV (%Strongly agree/agree)	66.1%	66.3%	66.8%
*=p<0.05 **=p<0.01			

In terms of recent and cumulative television exposure, it is observed that both the recently exposed (4.2%) and those exposed in both time periods (6.0%) are more likely to report forced sex as compared with 2.0% of the never exposed group. As mentioned in a previous section, the percentage of respondents reporting forced sex in the last 12 months is low, so again, caution should be taken when interpreting these results. No other significant marginal or cumulative effects of television exposure were found on the other forced sex and physical violence outcomes.

CHAPTER 7: VALUE-ADDED OF THE REGIONAL PROGRAM PARTNERS

A key objective of this evaluation is to assess the value-added of the combined interventions of the two Regional Program partners. This objective intends to measure whether greater health benefits are gained through the combination of Regional Program partner interventions relative to independent, stand-alone interventions. The rationale for this assumes that synergies exist between the interventions of the two partners and that these synergies amplify the potential effects of exposure. The post-only evaluation design allows for the examination of the effects of different exposure patterns by categorizing respondents based on their exposure to the two partners, and then examining differences in mean outcomes through bivariate and multivariate analyses that control for observable differences between the groups.

As was presented in the previous Lusweti and SAfAIDS sections, the effect of exposure to a single type of media or partner intervention involves a straightforward comparison of those exposed with those unexposed to that media. When looking at combined interventions, numerous comparisons are possible and multiple counterfactuals can be isolated. In the case of Swaziland, it becomes necessary to isolate the sample of respondents who: 1) remained unexposed to any of the partner's interventions; 2) were exposed to only one of the partner's interventions, but not the other; or 3) were exposed to both interventions. However, only 23 respondents were exposed to SAfAIDS only, so the approach taken was to create an interaction term between exposure to any Lusweti programs and any SAfAIDS programs and then to estimate the multivariate models using the individual partner exposure variables and the interaction term (as well as the other control variables). The coefficient of the interaction term represents the value-added of exposure to the combination of SAfAIDS and Lusweti interventions on a specific health outcome, controlling for other potential confounding factors. A total of 403 (10.4% of the total sample) individuals were exposed to both Lusweti and SAfAIDS.

The limitations of this design are that: 1) it is not possible to determine whether any additive effects of exposure to combined interventions are due to the synergies between the partners or simply a greater intensity of exposure; and 2) the feasibility of the analysis relies heavily on the existing exposure patterns within the data. Results for this analysis are presented below.

7.1 MULTIPLE PARTNERS

The first table in this section presents the results of the value-added analysis on outcomes relating to multiple partnerships and sexual behavior. The results are mixed in terms of the value-added of exposure to both interventions. In some cases, the interaction of exposure to both programs is significant in the hypothesized direction while in others, it is opposite to the hypothesized direction. For example, individuals exposed to both programs are less likely to agree that their husband or cohabitating partner has another sex partner, although this effect is of little measurable size (i.e., the coefficient=0.0000). In addition, less than 1 percent of respondents exposed to both programs report giving gifts or money in exchange for sex with their last partner as compared with 12.4% of the unexposed and 17.3% of those exposed to Lusweti only. There is also a significant effect on the percentage of respondents who agree that they can resist the temptation of having sex with someone other than their main partner, 97.7% exposed to both, as compared with 80.1% of unexposed and 82.7% of those exposed to Lusweti only.

Table 61: Value-added of Lusweti and SAfAIDS on MCP

	No exposure	Any Lusweti	Any SAfAIDS	Lusweti*SAfAIDS
Multiple partners (past 12 months)	12.9%	15.9%	33.8%**	6.3%
Multiple partners (past month)	5.0%	5.1%	10.0%	2.3%
More than one partner within 3 months period (past 12 months)	4.8%	11.7%**	9.2%	3.9%
Reports currently having more than one partner	10.5%	7.5%	7.6%	19.9%
Agrees that husband/cohabitating partner has another sex partner who is not a wife	21.0%	28.8%	100.0%	0.0%**
Gave gifts or money in exchange for sex with last regular partner	12.4%	17.3%	56.6%**	0.6%**
Can resist temptation of sex with person besides main partner (%Agree)	80.1%	82.7%	39.6%**	97.7%**
Leaders speak out about risk of HIV if MP (%Strongly agree/agree)	66.3%	69.1%	95.1%**	26.8%**
Leaders discourage multiple partners (%Very often/sometimes)	38.0%	43.1%	71.4%**	18.3%*

However, there appears to be a negative additive effect of exposure to both programs on two community norms indicators. Respondents are asked how much they agree that leaders in their communities speak out about the increased risk of HIV with having multiple sexual partners and if they feel that community leaders discourage people from having multiple partners. For both of these outcomes, individuals exposed to both programs are less likely to agree with these statements than

individuals in other categories; 26.8% exposed to both agree that leaders openly discuss the HIV risks of having multiple partners as compared with 66.3% of unexposed and 69.1% of individuals exposed to Lusweti only. Approximately 18.3% of respondents exposed to both report that community leaders discourage multiple partners as compared with 37.9% of the unexposed group and 43.1% of the Lusweti only. Finally, there is no significant additive effect of exposure to both programs on multiple partnerships in the last year, in the last month, or in the proportion of respondents who report currently having more than one sexual partner.

7.2 OTHER HIV RISK FACTORS

There are significant value-added results on three outcomes related to other HIV/AIDS risk factors (Table 62). It is hypothesized that increased exposure would result in people being more concerned about the risk of contracting HIV than people who had not been exposed to any of the interventions. There is a very strong additive effect of exposure to both programs on being worried about becoming infected with HIV (82.1% versus 41.2% unexposed and 50.4% exposed to Lusweti only). There is also a significant effect of dual exposure on knowing that the statement *TB can't be cured if you are HIV+* is false (84.5% versus 63.5% unexposed and 58.1% exposed to Lusweti only). There is one negative and significant finding; people exposed to both programs are less likely to report knowing where to get information about HIV/AIDS. This is contrary to what is expected as it is assumed that increased exposure would lead to increased knowledge about where to get information.

Table 62: Value-added of Lusweti and SAfAIDS on other HIV risk factors

	No exposure	Any Lusweti	Any SAfAIDS	Lusweti*SAfAIDS
Worried about becoming HIV infected (%Worried)	41.2%	50.4%	6.1%	82.1%**
Likely to be infected now (%Agree)	15.6%	23.5%**	7.0%	21.4%
TB can't be cured if HIV+ (%False)	63.5%	58.1%	36.0%	84.5%*
Knows where to get information about HIV/AIDS	84.6%	91.9%**	100.0%	0.0%*

7.3 HIV COMMUNICATION AND CONDOM USE

In terms of HIV communication, it is expected that program exposure would lead to increased communication between sexual partners, which is considered a precursor to other behaviors such as increased condom use. However, people exposed to both interventions are less likely to have discussed either sexual dissatisfaction or satisfaction with their spouse or regular cohabitating partner (Table 63).

For example, less than 1 percent of respondents exposed to both programs report discussing sexual dissatisfaction with their partner as compared with 68.2% of the unexposed group and 58.5% of the group exposed to Lusweti only. The interaction term is also significant, in the opposite direction, when it comes to the percentage of respondents who report being satisfied when they have sex with their spouse or cohabitating partner.

Table 63: Value-added of Lusweti and SAfAIDS on HIV communication and condom use

	No exposure	Any Lusweti	Any SAfAIDS	Lusweti*SAfAIDS
HIV Communication				
Sex life improves with communication with partner (%Agree)	89.0%	93.1%**	89.7%	93.1%
Percentage who have discussed sexual dissatisfaction with spouse/regular cohabitating partner	74.9%	69.8%	99.9%**	0.1%**
Percentage who are satisfied when having sex with spouse/regular cohabitating partner	87.8%	91.7%	100.0%**	0.2%**
Condom use				
Condom use at last sex with regular partner	53.4%	60.8%	18.3%	84.9%
Condom use at last sex among those with multiple partners	71.6%	77.7%	46.9%	85.0%
Condom use in marriage accepted (%Strongly agree/agree)	64.4%	75.4%**	75.3%	52.8%
Women can ask regular partner to use condom (%Strongly agree/agree)	63.6%	73.6%**	73.8%	49.2%

While there is a positive effect of being exposed to any Lusweti programs on two community norms regarding condom use (condom use in marriage is accepted and women can ask a regular partner to use a condom), there is no additive effect of being exposed to both interventions on either of these outcomes. There are also no significant additive effects of exposure to both programs on condom use at last sex with a regular partner or among those who report having multiple partners.

7.4 HIV TESTING AND TREATMENT

This next section presents the results of the value-added analysis on HIV testing and treatment behaviors. In general, the results are not in the desired direction. There are no significant effects of being exposed to both programs on having ever been tested for HIV or getting an HIV test in the last 12 months. However, the interaction terms for both receiving the results of the most recent HIV test and agreeing that it is important to know your HIV status are significant but they indicate a negative additive

effect of exposure to both interventions. For example, while 97.6% of the unexposed who had been tested for HIV had received the results of their most recent HIV test but the percentage was only 1% for those exposed to both (Table 64).

Table 64: Value-added of Lusweti and SAfAIDS on HIV testing and treatment

	No exposure	Any Lusweti	Any SAfAIDS	Lusweti*SAfAIDS
HIV Testing				
Ever tested for HIV	57.6%	67.9%	56.7%	61.4%
HIV test in the last 12 months	37.7%	52.1%**	24.3%	57.3%
Received results of most recent HIV test	97.3%	97.8%	100.0%	1.0%**
It is important to know your HIV status	97.6%	97.7%	100.0%**	2.7%**
HIV Treatment				
Willing to care for someone on ART	86.1%	92.5%**	41.9%	97.5%
ARVs prevent MCT during pregnancy	72.0%	77.4%*	95.0%	37.4%*

The results of the value-added analysis are not any more promising when looking at the treatment outcomes. Although the 97.5% of respondents exposed to both programs are willing to care for someone on ART as compared with 86.1% of the unexposed and 92.5% of those exposed to Lusweti only, this difference is not significant (p=0.0648). There is a significant effect of exposure to both programs on the percentage of respondents who know that ARVs prevent MCT during pregnancy, but again not in hypothesized direction. It is expected that being exposed to both programs would lead to more knowledge of HIV transmission, but this is not the case for this outcome.

7.5 STIGMA AND FORCED SEX AND PHYSICAL VIOLENCE

There is only one significant value-added effect of being exposed to both interventions on the stigma outcomes (Table 65). It is observed that 80.7% of the individuals exposed to both programs disagree with the statement *telling people you are HIV positive doesn't help* compared with 64.7% of the unexposed and 65.2% of the respondents exposed to Lusweti only.

Table 65: Value-added of Lusweti and SAfAIDS on stigma and forced sex and physical violence

	No exposure	Any Lusweti	Any SAfAIDS	Lusweti*SAfAIDS
Stigma				
Telling people you are HIV+ doesn't help (%Disagree)	64.7%	65.2%	43.2%	80.7%*
Forced Sex and Physical Violence				
Forced sex in the last 12 months	1.8%	3.0%	10.8%	0.3%
Physical GBV in the last 12 months	6.5%	6.3%	2.8%	13.6%

	No exposure	Any Lusweti	Any SAfAIDS	Lusweti*SAfAIDS
Reported physical violence	68.2%	63.4%	1.0%**	0.4%**
Report violence to family, friend, or community member	68.1%	76.4%	1.0%**	0.0%**
Report violence to police or authority	41.8%	40.0%	0.31%**	99.6%**

There are no observed significant effects of exposure to both programs on either experiencing forced sex or physical violence in the last 12 months. However, there are negative and significant effects on reporting physical violence to anyone and reporting it to either a family, friend, or community member (among those who experienced physical violence in the last 12 months). There is a significant additive effect from exposure to both Lusweti and SAfAIDS on reporting physical violence (experienced in the last 12 months) to the police or other traditional authorities (99.6% versus 41.8% of the unexposed, and 40.0% of those exposed to Lusweti only). As previously mentioned, sample sizes are small so caution needs to be take when interpreting these results.

WORKS CITED

Becker, S. and M. Caliendo. 2007. --Sensitivity Analysis for Average Treatment Effects. Institute for the Study of Labor. Bonn, Germany.

Becker, S. and A. Ichino. 2002. Estimation of average treatment effects based on propensity scores. *The Stata Journal* 2, no. 4: 605-34.

Boesten, K. and Z. Chalabi. 2006. Optimization of Household Survey Sampling Without Sample Frames. *International Journal of Epidemiology 35 (3): 751-5.*

Bollen, K. A. 2002. Latent variables in psychology and the social sciences. *Annual Review of Psychology* 53: 605-34.

Bollen, K. A., and W. R. Davis. 2009. Two Rules of Identification for Structural Equation Models-Introduction. *Two Rules of Identification for Structural Equation Models* 16, no. 3: 523-36.

Bollen, K. A., and J. S. Long. 1992. Tests for Structural Equation Models - Introduction. *Sociological Methods & Research* 21, no. 2: 123-31.

Brogan, D. et al. 1994. Increasing the Accuracy of the Expanded Programme on Immunization's Cluster Survey Design. 1994. *Ann Epidemiology* 4(4): 302-11.

Central Statistical Office [Swaziland] and Macro International Inc., 2008. *Swaziland Demographic and Health Survey, 2006-7,* Mbabane, Swaziland and Calverton, MD.

Department of Education. 2004 and 2008. Life Skills Curriculum.

Filmer, D., and L. Pritchett. 2001. Estimating wealth effects without expenditure data--or tears: an application to educational enrollments in states of India. *Demography* 38, no. 1: 115-32.

Grais, R.F. et al. 2007. Don't Spin the Pen: Two Alternative Methods for Second-stage Sampling in Urban Cluster Surveys. *Emerging Themes in Epidemiology* 4: 8.

Greene, W. H. *Econometric Analysis*. 2002. New York: Prentice-Hall.

Green, S.E. 1991. How many subjects does it take to do a regression analysis? *Multivariate Behavioral Research* 26:3 499-510.

Guilkey, D. K., P. Hutchinson, and et al. 2006. Cost-effectiveness analysis for health communication programs. *Journal of Health Communication* 11, no. Supp 2: 47-67.

Hall, James. 2011. AIDS Info Dissemination Expands in Swaziland. The Swazi Observer, July 20, 2011. [http://www.observer.org.sz/index.php?news=27604; accessed May 16, 2012].

Henderson, R. H., and T. Sundaresan. 1982. Cluster sampling to assess immunization coverage: a review of experience with a simplified sampling method.. 60 (2): 253-60 (1982). *Bulletin of the World Health Organization* 253-260.

Hudson, C. P. 2010. Measuring concurrent partnerships . *The Lancet* 375: 1868-69.

Hutchinson, Paul, and Jennifer Wheeler. 2006. Advanced methods for evaluating the impact of family planning communication programs: evidence from Tanzania and Nepal. *Studies in Family Planning* 37, no. 3: 169-86.

Kincaid, D. L., and W. Parker. 2008. *National AIDS Communication Programmes, HIV Prevention Behaviour, and HIV Infections Averted in South Africa*, JHHESA, Pretoria .

Kirby, J. B., and K. A. Bollen. 2009. Using Instrumental Variable Tests to Evaluate Model Specification in Latent Variable Structural Equation Models. *Sociological Methodology* 39: 327-55.

Leuven, E., and B. Sianesi. 2003. *PSMATCH2: Stata Module to Perform Full Mahalanobis and Propensity Score Matching, Common Support Graphing and Covariate Imbalance Testing.*

Lu, B., E. Zanutto, and et al. 2001. Matching with doses in an observational study of a media campaign against drug abuse. *Journal of the American Statistical Association* 96, no. 456: 1245-53.

Lusweti. 2009. Summary Evaluation of the Lusweti Multimedia Programmes, 2002-2007. Manzini: Lusweti/Institute for Health Development Communication.

Lusweti. 2012. Lusweti – Institute for Health Development Communication. http://www.lusweti.org.sz/ [Accessed 6/9/2012].

Mamba, A. 2011. Why Neglect Our Own? *The Swazi Observer*, March 26, 2011 [http://www.observer.org.sz/index.php?news=22858; accessed June 26, 2012].

Mojapele, Maserame. S.d. The Role of Changing the River's Flow Programme in Turning the Tide. www.safaids.net [Accessed 5/16/2012].

Posner, M. A., A. S. Ash, and et al. 2001. Comparing Standard Regression, Propensity Score Matching, and Instrumental Variables Methods for Determining the Influence of Mammography on Stage of Diagnosis. *Health Services and Outcomes Research Methodology* 2, no. 3-4: 279-90.

Reza, A. et al. 2009. Sexual violence and its health consequences for female children in Swaziland: a cluster survey study. *The Lancet:* 373, *1*966 - 1972.

Rogers, Everett. 1962. *Diffusion of Innovations* . Glencoe, Illinois: Free Press.

Roodman, D. (2009). Estimating Fully Observed Recursive Mixed-Process Models with *cmp*. Washington, D.C., Center for Global Development.

Rosenbaum, P. R. 1984. The consequences of adjustment for a concomitant variable that has been affected by treatment. *Journal of the Royal Statistical Association, Series A* 147, no. 5: 656-66.

Rosenbaum, P. R., and D. B. Rubin. 1983. The central role of the propensity score in observational studies for causal effects. *Biometrika* 70: 41-55.

SAfAIDS. 2012. Changing the River's Flow. Challenging Gender Dynamics in a Cultural Context to Address HIV. http://www.safaids.net/programme/ctrf [Accessed 5/16/2012].

SAfAIDS. 2011. Best Practices on Challenging Gender Dynamics in Cultural Contexts. SWANNEPHA and NATICC Implementing the 'Changing the River's Flow' Programme in Swaziland. Pretoria: SAfAIDS Regional Office.

Soul City. 2012. About Lusweti – Swaziland. http://www.soulcity.org.za/projects/regional-project/swaziland [Accessed 6/8/2012].

Soul City. 2010. *The Making of OneLove_Draft_3.*

Stata Corp. 2011. *Survey Data Reference Manual*, Stata Press, College Station, TX.

United States Census Bureau. 2012. International Data Base. http://www.census.gov/population/international/data/idb/region.php [Accessed 6/21/2012].

Wooldridge, J.M. 2009. *Introductory Econometrics: A Modern Approach*, 4th Edition, Mason, Ohio: South-Western