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PREDICTORS OF BEHAVIOUR CHANGE AMONG FEMALE SEX WORKERS PARTICIPATING IN AMREF'S MAANISHA PROGRAMME, KENYA

Josephat Nyagero[*]

Samwel Wangila[**]

Vincent Kutai[‡]

Susan Olango[§]

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[*] Josephat Nyagero (MA, Population Studies) is a Researcher based at AMREF Headquarters and currently coordinates activities in the Research Unit, Health Programme Development Directorate

[**] Samwel Wangila (MSc, Population Studies) is the Knowledge Management Manager, Maanisha Programme, AMREF Kenya Country Office

[‡] Vincent Kutai (MPH) is a Field Co-ordinator, Maanisha Programme Western Region, AMREF Kenya

[§] Susan Olang (BA Sociology) is a Field Co-ordinator, Maanisha Programme, Nyanza North Region, AMREF Kenya

The African Medical and Research Foundation (AMREF)
PO Box 27691 – 00506, Nairobi, Kenya
Tel: +254 20 6993000
Fax: +254 20 609518
Email: **info@amref.org**
Website: **www.amref.org**

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ABBREVIATIONS & ACRONYMS

AIDS	Acquired Immune Deficiency Syndrome
AMREF	African Medical and Research Foundation
CBO	Community-Based Organisation
CI	Confidence Interval
CSO	Civil Society Organisation
CSW	Commercial Sex Worker
DfID	Department for International Development
DRC	Democratic Republic of Congo
ESRC	Ethics and Scientific Review Committee
FBO	Faith-Based Organisations
FGD	Focused Group Discussion
FHI	Family Health International
FSW	Female Sex Worker
HBM	Health Belief Model
HCBC	Home and Community Based Care
HIV	Human Immunodeficiency virus
HTA	High Transmission Area
IDU	Injecting Drug User
IGA	Income Generating Activity
KCHDP	Kawempe Community Health Development Programme
MARPS	Most-At-Risk Populations
MOH	Ministry of Health
MSM	Men who have Sex with Men
NACC	National AIDS Control Council
NGO	Non-Governmental Organisation
NHSSP	National Health Sector Strategic Plan
ODSS	Organisational Development and Systems Strengthening
OR	Odds Ratio
OVCs	Orphaned and Vulnerable Children
PHE	Peer Health Educator
PLWHIV	People Living With HIV
PMTCT	Prevention of Mother-To-Child Transmission
PSI	Population Services International
PSO	Private Sector Organisation
PwPs	Prevention with Positives
RH	Reproductive Health
Sida	Swedish International Development Co-operation Agency
STD	Sexually Transmitted Disease
STI	Sexually Transmitted Infection
UNAIDS	The Joint United Nations Programme on HIV/AIDS
VCT	Voluntary Counselling and Testing
WHO	World Health Organisation

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ABSTRACT

HIV prevention remains one of the most efficacious strategies for tackling the pandemic, especially owing to the fact that there is still no known cure for AIDS. Initiatives aimed at targeting most-at-risk populations (MARPS) such as commercial sex workers are key in arresting the transmission of HIV among the general population. The purpose of this paper was to understand the predictors of behaviour change among female sex workers participating in the Maanisha Programme through CSOs in Kenya.

This was a cross-sectional study conducted between June and July 2010 in Western and Nyanza provinces. Snowball sampling was used to contact and interview 156 female sex workers. Additionally, six focus group discussions for FSWs were conducted. Binary logistic regression was used to analyse the quantitative data. Qualitative data was categorised and summarised thematically.

Results revealed 59.1% of the FSWs had undergone behaviour change. The multivariate regression model found that good behaviour change was associated with the level of education (p=0.035, adj. OR 2.23, CI=1.06-4.69), religious affiliation (p=0.001, adj. OR=4.61, CI=1.95-13.16), number of years involved in sex work (p=0.025, adj. OR 2.36, CI=1.12-5.00), and knowledge on prevention of HIV (p=0.020, adj. OR 4.37, CI=1.26-15.11). Engagement in alternative income generating activities (IGAs) was almost statistically significant (P=0.054, adj. OR=2.30, CI=0.98-5.38).

Re-orientation of the peer education programme to focus on HIV preventive measures beyond use of condoms is recommended. The Maanisha Programme should initiate distribution of female condoms. This will enhance the female sex workers' ability to ensure safer sex. Prevention of re-infection by integrating treatment and adherence into the programme will strengthen prevention among those already infected. A strengthened access to alternative sources of income is likely to result in positive behaviour change among FSWs in the Maanisha Programme.

1. BACKGROUND

1.1 Introduction

The role of female commercial sex workers in facilitating transmission of sexually transmitted infections (STIs) including HIV and AIDS is a subject of continued interest (Seib *et al*, 2009). Commercial sex workers (CSWs) and injecting drug users (IDUs) are often categorised as two of the four populations "most-at-risk" of becoming infected with HIV due to behaviours that heighten their vulnerability to the virus (Beard *et al*, 2010). According to the Joint United Nations Programme on HIV and AIDS, the term "most-at-risk populations" (MARPS) refers to men who have sex with men (MSM), injecting drug users, sex workers and their clients (UNAIDS/FHI, 2003). Previous studies (Ngugi *et al*, 1988; Nzyuko *et al*, 1991) consistently identified certain lifestyles as predisposing individuals to higher risk of acquiring HIV infection in Eastern and Central Africa. Some of these lifestyles included long distance truck driving, working in bars and hotels and engaging in commercial sex work as a source of income.

Over time, the African Medical and Research Foundation (AMREF) has initiated interventions in Kenya, Tanzania and Uganda which aim at fostering behaviour change among MARPS. These entail peer education including promotion of condom use and appropriate STD health-seeking behaviour among CSWs. This paper presents an assessment of how FSWs participating in AMREF's Maanisha Programme have engaged in positive health behaviour change.

1.2 Historical perspective of AMREF's CSW interventions

AMREF's interventions targeting CSWs dates back to the late 1980s when the Truck Drivers' Projects in Kenya and Tanzania were designed. This was followed by the Kawempe Community Health and Development Project in Uganda and lastly the Maanisha initiative in Kenya. Generally, these interventions aimed at promoting behaviour change and specifically preventing transmission of HIV from the CSWs (seen as "core transmission groups") to the general population.

Truck Drivers' Project in Kenya

The two-year Truck Drivers' AIDS Project implemented along the Trans-Africa Highway in Kenya was started in 1989. The long distance truck drivers were believed to be at high risk of contracting and transmitting AIDS. This was partially because they stayed away from their

families for a long time yet they had a lot of disposable income to spend and access to multiple sex partners such as barmaids and prostitutes located at several truck stops along the route (Nzyuko *et al,* 1991). The purpose of the project was to identify strategies for behavioural change which would motivate this high risk group (truck drivers and their sexual partners) to adopt "safe sex" practices. The key project interventions included use of peer education for promotion of desired behaviour change including use of condoms, and adoption of one sexual partner or at least the limitation of number of sexual partners (Nzyuko *et al*, 1991).

The project was based at two principle truck stops – Simba and Mashinari – located east of Nairobi along the Nairobi-Mombasa highway. The two centres were adopted as truck stops due to availability of amenities such as bars, hotels, CSWs, cheap accommodation, security, and preferred foods, especially roasted goat meat. The project interventions comprised sustained health education and initiatives promoting behaviour change. The project took cognisance of the fact that truck drivers and their sex partners had relatively low levels of formal education. Subsequently, a verbal behaviour change and communication approach including focus group discussions and training of peer educators to promote AIDS education through personal communication was adopted. The key output of the project were increased knowledge on the modes of transmission and prevention of HIV, better access to and use of condoms, and reduced incidences of STIs among participating FSWs and their clients (Nzyuko *et al*, 1991).

Truck Drivers' Project in Tanzania

In Tanzania, AMREF's Truck Drivers' Project aimed to induce behaviour change for risk reduction, via greater condom use and appropriate STD health-seeking behaviour of long distance truck drivers, their assistants and sexual partners (AMREF, 1995). The project used a peer education approach to implement activities. The basic concept of peer health education was that people with common experiences, interests and life styles were more effective teachers within that group than outsiders. Thus, since peer health educators (PHEs) share concerns, values and norms of the target group, it was believed that they would be more credible, trusted and gain better access to the target population. In addition, the PHEs' personal qualities such as interactive skills, communication skills, honesty and trust. In 1993 the Truck Drivers' Project evolved to provide STD services to those living at the truck stops, targeting female sex workers in

particular. An intervention to improve the management of STDs using the syndromic approach was adopted and was found to shorten the period of infectivity (Grosskurth *et al*, 1995).

From the beginning of 1995, STD services were introduced stepwise to 21 truck stops covered in the project. Three categories of services were provided: i) STD services delivered to women and their sexual partners, offered outside the normal facility and official working hours as an avenue to reach communities in high transmission areas (HTAs), ii) STD services were integrated into the regular activities of the local health facility offered by clinicians. This set of services was supported and promoted by a local infrastructure which was established and comprised PHEs, a Patron/Matron, AIDS Advisory Committees and Women Health Groups. The comprehensive implementation package included: condom promotion and distribution, health education, active referral to the local STD service, STD management using the syndromic approach, risk assessment and partner referral. All activities were supervised and supported through project staff and regional/district health authorities.

Results for surveys undertaken in 1993, 1994 and 1996 in the Truck Drivers' Project indicated that there was a reduction in the prevalence of *T. vaginalis* and syphilis. Overall, *T. vaginalis* prevalence was 35%, 30% and 20% in 1993, 1994 and 1996 respectively. Prevalence of syphilis was 30%, 28% and 18% in 1993, 1994 and 1996 respectively. HIV prevalence was reported to remain almost stable during the three surveys (Nyamuryekung'e *et al*, 1997). A set of additional indicators were observed to measure behaviour change that could be partially attributed to the intervention in Tanzania. In response to preventive measures against STD, 97 (39%) of the women who used project services compared to 411 (33%) of those who did not use project services reported sticking to one sexual partner. Additionally, 74 (29%) of those who used project services compared to 307 (25%) who did not, used condoms. This was in comparison to 64 (25%) of those who used project services as opposed to 382 (31%) who did not use the services and did nothing to protect themselves from STDs – P = 0.06 (AMREF, 1995). All these indicators implicitly demonstrate clear evidence that there was a positive change in health seeking behaviour and practices among the CSWs targeted in the Truck Drivers' Project in Tanzania, although it was not significant.

Kawempe Community Health and Development Project in Uganda

AMREF in Uganda initiated the Kawempe Community Health and Development Project (KCHDP) in 1999 as a response to the socio-economic needs of commercial sex workers. The project is located in Kampala's Makerere III and Bwaise II parishes of Kawempe Division. The purpose of the initiative was to improve the health of sex workers and communities living in slum areas and, more specifically, to reduce the spread of HIV and other STIs. Activities implemented to achieve this included improving awareness of HIV prevention among sex workers; improving diagnosis and management of STIs for sex workers; encouraging uptake of voluntary counselling and testing (VCT) and use of family planning by sex workers and the wider community; providing sex workers with alternative livelihood skills and supporting people living with HIV and AIDS. This was done through innovative art and drama education that increased awareness and reduced high-risk sexual behaviour amongst the out-of-school youth and CSWs. Further, it strengthened community networks for reduced stigmatisation and discrimination caused by traditional practices. This partly formed the basis upon which the Maanisha CSW component in Kenya was designed.

Through KCHDP, the training of community health volunteers and health facility staff improved awareness and demand for services and improved the quality of services provided. The evaluation (Jitta & Okello, 2010) showed an increase in demand for condoms and for VCT and an increase in early treatment seeking for STIs among sex workers. There was also evidence of reduced incidence of HIV and other STIs among sex workers, compared with neighbouring non-intervention parishes. Further, there were indications of behaviour change among the sex workers in terms of increased demand for safe sex practices, reduced unplanned pregnancies, and increased quality of life. All these were partially attributed to the change in behaviour and lifestyle of the sex workers participating in the initiative. Many of the CSWs had adopted consistent use of condoms, regularly seeking for STI services, reduced the sex partners and some quit the trade altogether in favour of other income generating activities such as tailoring and hairdressing (Jitta & Okello, 2010).

Maanisha Community Focused Initiatives in Kenya

The Maanisha Programme in Kenya is the focus of this paper. The initiative was launched in 2004 by AMREF and its current phase is expected to end in September 2012. The project targets people living with HIV and AIDS, female sex workers (FSWs), orphans and vulnerable children (OVC), men who have sex with men (MSM), youth, injecting drug users, widows and widowers and the general population. In reaching these population subsets, the programme works with civil society organisations and private sector organisations as well as the Government of Kenya structures. This paper focuses on the activities of the FSWs.

The goal of the project is to contribute to a sustained reduction in the prevalence of HIV, AIDS and STIs in Kenya. Maanisha is currently being implemented in the whole of Nyanza (23 districts), Western (24 districts) and Eastern Provinces (28 districts) and parts of the Lake Victoria Basin Districts of Rift Valley Province (17 districts). The list of the districts covered by the project is presented in Appendix 1. Two approaches are used in implementation of the project: eligible CSOs and PSOs are given grants to implement HIV interventions, and capacity building of these organisations is undertaken through the organisational development and systems strengthening (ODSS) approach.

The HIV and AIDS activities under the Maanisha Programme range from promotion of behaviour change communication strategies including prevention with positives (PwPs) to treatment, care, support and advocacy. The programme aims at sustained reduction in the incidence of HIV in Kenya. It embraces the overall paradigm shift in AMREF's approach of recognising the community as the basic level of health care. Strengthening of community structures with the rest of the health system is central in the project. This is in tandem with the Ministry of Health vision as stipulated in the second National Health Sector Strategic Plan (NHSSP II). The project's key activities focusing on FSWs include: i) continuous recruitment of barmaids who also serve as commercial sex workers through snowball sampling approach. This entails encouraging each recruited and trained FSW (peer educator) to recruit 15-20 other FSWs that will then form a cluster/support group, ii) sensitization of other key stakeholders such as the police on issues of harassment of FSWs and violation of sex workers' human rights, and iii) provision of home and community-based care (HCBC) services by the CSOs to both infected and non-infected sex workers.

From the foregoing, it is clear that AMREF has been consistent in its approach to implementing interventions targeting commercial sex workers in the three countries of operation. All the projects embrace the overall AMREF approaches of community partnering and capacity building by consistently recognising the community as the basic level of health care. Collaboration with the ministries of health and other stakeholders has also been embraced. This approach is pivotal in contributing to the success and sustainability of AMREF's interventions upon their completion. However, it is important that a detailed assessment on the initiatives' contribution in behaviour change among participating CSWs is made. This paper is a deliberate effort to describe the level and predictors of behaviour change among FSWs participating in the Maanisha Programme in Kenya as a case study.

1.3 Problem statement

AMREF started implementing interventions targeting behaviour change of commercial sex workers in the late 1980s. The first of such projects was initiated in Kenya, followed by Tanzania and later Uganda. The supply side of the trade in sex is precipitated and perpetuated by the rising poverty levels. This is a critical underlying cause of the upsurge in sex work (Nyzuko *et al*, 1991; Tekola, 2007). The limited economic opportunity in the region is contributing to what is forcing many women and girls into participating in transactional sex so as to meet basic living expenses. Sex workers in Africa are often very young and mainly practise unsafe sex. The demand side for commercial sex is reinforced by the male migratory and circulatory practices and patterns while looking for employment. For example, truck drivers are on the road for several days and tend to maintain (sometimes regular) sex partners in almost all truck stops (Nyzuko *et al*, 1991). Further, males in Africa tend to move to the urban centres in search of employment, leaving their wives in their rural homes. The HIV prevalence among the sex workers who have been tested is high. For example the prevalence was estimated at 46.7% in the AMREF project site in Tanzania (Nyamuryekung'e *et al*, 1997), and between 24.4% and 38.8% in the Kawempe project (AMREF, 2005).

Governments, NGOs, development partners and communities are concerned with the rising numbers of people who are involved in commercial sex work and the subsequent high risk of

contracting HIV, AIDS and other STIs. In response to this scenario, a number of reproductive health behaviour change interventions have recently been implemented by NGOs, including AMREF, but their impact and contribution to good health seeking behaviour among sex workers is not adequately documented. The aim of AMREF's interventions targeting sex workers has been to make them agents of change by: 1) becoming safe sex practitioners, protecting themselves and clients from HIV and other STIs, 2) educating peers and 3) seeking prompt treatment when infected. The purpose of this paper is to understand the level and associated factors of behaviour change among FSWs participating in AMREF's Maanisha Programme. This will contribute to informed advocacy for policy change and promotion of better health practices for sex workers at project level.

1.4 Research questions

To what extent has behaviour change occurred among FSWs participating in AMREF's Maanisha Programme in Kenya? What factors are associated with the observed behaviour change?

1.5 Study objectives

The broad objective of this study was to understand the level and predictors of good health behaviour change among FSWs participating in AMREF's Maanisha Programme. The study specifically sought to:

1) Describe the level of behaviour change among FSWs participating in AMREF's Maanisha Programme in Kenya
2) Assess the influence of socio-demographic characteristics of FSWs on the level of behaviour change
3) Establish the relationship between HIV and AIDS knowledge partially gained through the peer education activities and behaviour change among FSWs
4) Determine the association between involvement in alternative economic activities and level of behaviour change.

1.6 Study justification

This study will help to determine whether Maanisha Programme inputs have translated into positive health behaviour changes among participating FSWs. Further, the results will be useful

to government ministries and NGOs interested in improving the health of the target population. The study therefore provides necessary information for planning the scale up and replication of similar interventions.

2. REVIEW OF LITERATURE

In this paper, commercial sex (also referred to as prostitution) is defined as the regular exchange of money or goods for sexual services. According to Overs (2002), this exchange involves a set of actors, including the sex worker, the client, and sometimes a third party. The *sex workers* refer to all those people who consciously see their supply of sexual services as an income-generating activity. The *clients* are people (usually men) who pay for sexual services, with cash or other resources, either explicitly or within an agreed package.

There is marked contrast between the CSWs in developed countries from those in the developing world. The Lapinski-Lafaive and Simpson study in Michigan (2004) states that use of male condoms is the main risk reduction strategy adopted by the CSWs. Use of drugs, mainly alcohol, cigarettes and heroin is prevalent among CSWs. Indeed, drug dependency is reported as one of the main initiate factors into commercial sex work and perpetuates its continuation in high-income countries. The study further found that a vast majority (98%) of the CSWs had been tested for HIV at some point in their lives with "just wanted to know" or "wanted peace of mind" as the main reasons for testing. In the developing countries, almost half of the CSWs engage in the trade mainly due to poverty and at very early ages (11-15 years). According to Dobe *et al* (2004), almost 70% of the CSWs in developing countries have contracted an STI with only 15% using condoms regularly while entertaining more than one client per day. Some entertain as many as five clients in a day. From the same study, it was evident that health knowledge is poor among the CSWs and that their health care seeking behaviour is neither informed nor scientific.

Commercial sex workers are known to be at high risk of contracting HIV and AIDS. Lapinski-Lafaive and Simpson (2004) reports that CSWs have a variety of concerns including; contracting of sexually transmitted diseases (STDs) and HIV/AIDS, asthma, high blood pressure, and dying or getting killed on the streets. There are many risk factors, including inconsistent condom use, presence of work-related violence (Cohan *et al*, 2006), younger age and presence of non-paying

sexual clients. In addition, years of engaging in commercial sex work has been associated with frequent acquisition of STIs.

According to Seib *et al* (2009), commercial sex workers are considered the core group for the transmission of HIV and other sexually transmitted infections. The regular partners or non-commercial partners of the female sex workers are another important risk group. There is growing evidence that interventions to reduce transmission levels of HIV among core groups can lead to successful risk reduction and decreased levels of infection. Such interventions provide best results when the packages and strategies to deliver them are tailored to different situations. According to studies (Alary *et al*, 2002; Ghys *et al*, 2002), the interventions that have been used as a response to commercial sex work include; development and dissemination of behaviour change messages, promotion of condoms and other barrier methods, accessible sexual health services, use of informal contacts, key informants, and "leaders" to access the population, peer health promotion and education, outreach activities, condom social marketing and distribution, and income generating activities among others.

Previous interventions targeting CSWs have yielded varied behaviour change across the world. In Ecuador (Solomon *et al*, 2008), prostitution is legal and its practice requires that CSWs carry a stamped permit booklet. To maintain the permit's validity, CSWs present themselves for STI screening every 15 days. This intervention has increased safety and decreased the risk of working in such establishments (Gutierrez *et al*, 2006). A recent study (Wang *et al*, 2007) reported that 95% of the CSWs in Senegal had undergone positive health behaviour change in comparison to the 40% level found in the Democratic Republic of Congo (Kayembe *et al*, 2007).

Previous studies have identified various determinants of behaviour change among CSWs. For example, a study by Sanjanthi *et al* (2008) identified knowledge and awareness of HIV and AIDS, perceived vulnerability, perceptions of outcomes including costs and benefits of condom use, social support, peer group comparison and condom use self-efficacy as key factors responsible for behaviour change among CSWs in India. Another study (PSI, 2006) reported population characteristics such as place of residence in the last two years, age, educational level and marital status as being important in determining the level of behaviour change. The

background characteristics (level of education, marital status and age) were similarly found to influence behaviour change among CSWs in north-western Tanzania (Mgalla & Pool, 1997) and Zambia (PSI, 2001). Another study in Malawi (Walden *et al*, 1999) found that the presence of sex worker peer educators led to increase in the use of condoms with paying clients.

3. METHODOLOGY

A combination of research methods were used to examine the extent to which AMREF's Maanisha Programme has fostered behaviour change and associated predictors among FSWs participating in the project. This section presents the theoretical framework, and methods of data collection and analysis employed in carrying out this study.

3.1 Theoretical framework[1]

The conceptualisation of the study was guided by the Health Belief Model (Rosenstock, 1966, 1974) and the Theory of Planned Behaviour (Fishbein & Ajzen, 1975; Ajzen & Fishbein, 1980) which are widely used to predict behaviour. The Health Belief Model (HBM) proposes that people are only motivated to carry out preventive health behaviours as a response to a perceived threat to their health. Two classes of variables: first, the psychological state of readiness to take specific action, and second, the extent to which a particular course of action is beneficial in reducing the threat are the pillars of the model. The Theory of Planned Behaviour presupposes that reasoned actions result from behavioural intentions that are largely based on one's attitudes and subjective norms (Rutter & Quine, 2002). Figure 1 summarizes the conceptualisation of the study.

The Maanisha Programme was designed to influence the behaviour of FSWs through a set of inputs such as peer education, condom distribution and income generating activities (IGAs), among others. The expected behaviour change is in terms of safe health practices (such as consistent use of condoms, reduced number of sex partners, non-sharing of sharps, regular seeking of STI medical checks and seeking of prompt STI treatment), and quitting the commercial sex work all together in favour of engagement in alternative sources of income. As proposed in the health belief model (HBM), the first group of variables highlighted in Figure 1

[1] The conceptual framework is based on Rosenstock's (1966, 1974) Health Belief Model and the Theory of Planned Behaviour (Fishbein and Ajzen, 1975 and Ajzen and Fishbein, 1980) which are widely used to predict behaviour.

focus on the psychological state of readiness to change behaviour considered in this study include; the CSWs' beliefs towards condom use, sharing of sharps, having multiple sex partners, regular STI medical check, prompt STI treatment and engagement in alternative income generating activities (Figure 1).

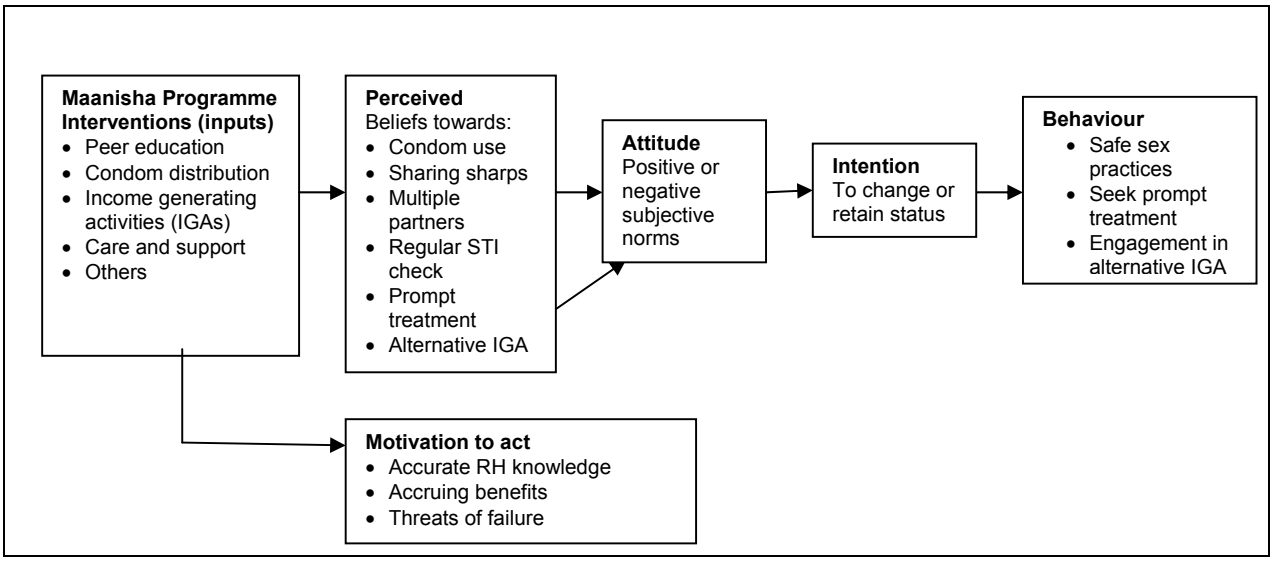

Fig 1: Theoretical framework of the study

In the second set of variables, this study presumes that behaviour change can be motivated through the provision of clear messages on the benefits accruing from the desired behaviour change being promoted and the threats of failure to adopt the change. The assumption here is that the resultant behaviour is based on positive attitudes and subjective norms whose formation may be significantly attributed to the set of AMREF project inputs and activities. Examples of expected benefits associated with motivation to act may include better health status and improved living standards for the FSWs. These factors assist in shaping attitudes and subjective norms resulting in shaping of intentions on decisions for behaviour change or retention of the status quo.

This study tested whether behaviour change towards good health practices (dependent variable) among participating FSWs was influenced by their socio-demographic characteristics (age, level of education, religion, marital status, having children, duration in sex work and participation in AMREF project), the level of knowledge on reproductive health, HIV and AIDS, and

participation in alternative economic activities. Figure 2 schematically illustrates this relationship.

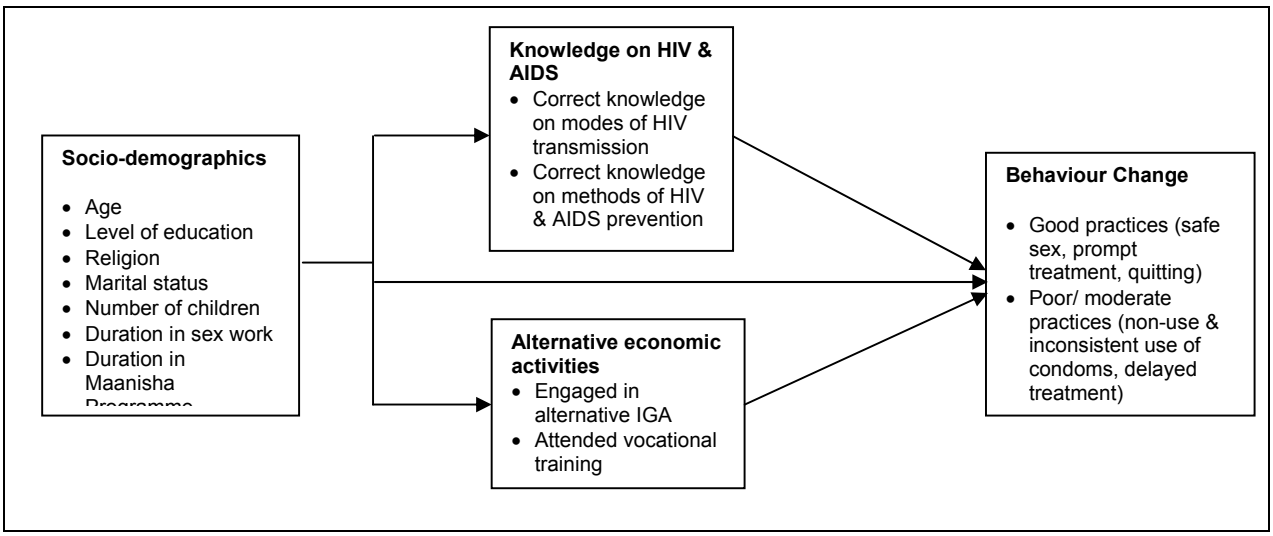

Fig 2: Conceptualisation framework of the study

The logistic regression model is the most appropriate in analysing the relationships of variables included in the study conceptual framework (Figure 2). This model relates the log odds (logits) to a set of variables and is often expressed in terms of logits. The ratio that a female sex worker will adopt good behaviour change (P_x), to the probability that she will not adopt desired behaviour change (q_x), is called the odds. Therefore, in this study the odds ratio simply refers to the probability that a FSW adopts the desired good behaviour to the probability that she does not. Thus, when we talk of a logit, we are simply referring to the natural logarithm of the odds. The logistic regression model can mathematically be expressed as:

$$\text{Ln}\,(P_x / q_x) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \ldots + \beta_n x_n + \gamma \qquad \ldots\textbf{\textit{Equation 1}}$$

Where, P_x = probability that an event will occur (in our case, is the probability that a FSW will adopt the desired good behaviour change),

q_x = Probability that an event will not occur (in our case, the probability that a FSW has not yet adopted the desired good behaviour change after the project intervention),

ln = natural log which is approximately equal to 2.71828.

β_0 to βn = are logistic regression coefficients. They represent unknown parameters that have to be estimated based on data obtained on the independent variable ($x_{1,\ldots}$ x_n)

$x_{1\ldots}+ x_n$ = are dichotomous/ interval independent or predictor variables which are basically expressed as a series of dichotomised variables, and;

γ = the error term.

Expressed in terms of logits as shown in equation 1, a unit change in the variable x_1, changes the logit of risk Ln (P_x /q_x) by an amount βn. The logit model is a linear function of the variables $x_{1\ldots}+ x_n$ indicating that the effect of x_1 does not depend on the values of the other variables.

Each β_1 measures the change in the logit of risk resulting from a change of one standard deviation in the variable x_1. In interpreting the logistic regression, the odds of an event occurring are mostly used. The odds of an event occurring are defined as the ratio of the probability that an event occurs to the probability that it will not. In order to use the odds, the logistic regression model is rearranged and rewritten in terms of the log of the odds, which is called a logit. This is as shown below:

$$\text{Log } \{\text{prob. (event)}\} \quad \text{Prob. (no event)} = b_0 + b_1x_1 + \ldots + b_px_p \qquad \ldots\textbf{\textit{Equation 2}}$$

From the above equation, it is clear that the logistic coefficient can be interpreted as the change in the log odds associated with one unit change in the independent variable. But it is easier to think of odds rather than log odds. Thus the logit model can be written as:

$$\frac{\text{Prob. (event)}}{\text{Prob. (no event)}} = e^{(b0 - b1X1 - \ldots - bpXp)} \qquad \ldots\textbf{\textit{Equation 3}}$$

The e raised to the power b1 is the factor by which the odds change when the i^{th} independent variable increases by one unit. If b is positive, this factor will be greater than 1, which means that the odds are increased: If b is negative, the factor will be less than 1, which means that the odds are decreased. When b is 0, the factor equals 1, which leaves the odds unchanged.

In our case, the probability of adopting the desired good behaviour change in a FSW is predicted to be dependent upon the selected independent characteristics of FSWs such as the age of the woman, their level of education, marital status, duration in commercial sex work, knowledge of HIV, religious affiliation and whether or not they were engaged in an alternative income generating activity.

3.2 Study hypotheses

Based on the relationship between variables, the study tested the following three null hypotheses:

1. Socio-demographic characteristics do not predict the behaviour change among FSWs.
2. Level of HIV and AIDS knowledge partially gained through the project's peer education activities does not influence the behaviour change among FSWs.
3. Engagement of FSWs in alternative economic activities does not predict the behaviour change.

3.3 Measurement of study variables

It was necessary to operationalise the definitions and measurement of key study variables. Behaviour change was defined as any new desired? Good behaviour associated with the prevention of HIV spread that occurred between the time of joining Maanisha Programme and participation in the study. This was measured using response-based score to a set of seven (7) questions. Those who had quit the trade were awarded the maximum score of 14 points. The seven questions that were used as behaviour change indicators in the study covered: 1) consistent use of condoms with regular partners, 2) consistent use of condoms with non-regular partners, 3) what FSWs do if a client declines to use a condom, 4) consistent use of condoms with clients after joining Maanisha, 5) reduced sexually transmitted infections after joining Maanisha, 6) not depending fully on sex work as a source of living since joining Maanisha, and 7) reduced number of clients since joining Maanisha.

Similarly, level of knowledge on HIV and AIDS was measured based on a three-point score (poor, moderate and good) to a set of 10 knowledge questions (four on transmission and six on prevention). Correct responses were awarded 1 point while no points were awarded for incorrect responses. Questions on modes of transmission included in the study were; 1) having unprotected sex, 2) having multiple sex partners, 3) sharing of infected blood and blood products, and 4)

mother-to-child transmission. Further, the HIV and AIDS knowledge level among FSWs was also measured based on modes of prevention including; 1) abstinence, 2) being faithful, 3) use of condoms, 4) PMTCT, 5) avoiding sharing of sharps, and 6) going for HIV testing.

Further, numerical socio-demographic variables (age, duration in sex work and involvement in AMREF's project) were measured in complete years while the responses to categorical variables (education, religion and marital status) were assigned to appropriate categories. Finally, engagement in alternative economic activities was measured using binary responses to two questions; 1) depended fully on sex work before participating in Maanisha Programme, and 2) currently engaged in an alternative IGA.

3.4 Data collection

Mixed research methods were used to carry out this study. This included the use of both quantitative and qualitative methods of data collection.

Quantitative survey among FSWs

A cross-sectional survey was conducted to measure behaviour change among FSWs in Western and Nyanza provinces in Kenya between June and July 2010. Recruitment was done through groups of FSWs participating in the Maanisha Programme. Respondents were eligible for participation if they: 1) were commercial sex workers; 2) a member of a group participating in the Maanisha Programme; 3) had participated in the Maanisha Programme for at least six months; and 4) provided informed consent.

A structured interview schedule was administered to 159 FSWs by trained interviewers. Snowball sampling procedure was used to identify respondents. Contacting of study FSWs was done through their group leaders. Fifteen such groups provided the initial contact. The questions covered included: socio-demographic characteristics, knowledge of HIV and AIDS, perceptions on risk to HIV infection, positive behaviour change accruing from participation in the Maanisha Programme. This formed the primary source of data used in this study.

Qualitative data

Two qualitative data collection methods were utilised in the study. In-depth interviews were conducted for project staff. The purpose was to gather their opinion on the behavioural changes observed among FSWs participating in the Maanisha Programme. Three FGDs were held with FSWs in Nyanza and Western provinces. The key issues covered in the in-depth interview and FGD guide were: reasons for engaging in the trade and extent to which Maanisha Programme had influenced the behaviour of FSWs. The qualitative information was thematically analysed based on relevant study objectives and appropriately presented.

3.5 Statistical analysis

A set of appropriate statistical analysis was carried out for the quantitative study data. Univariate descriptive and exploratory analyses were done by use of proportions for categorical variables and measures of central tendency for continuous variables. This level of analysis was pivotal in describing the socio-demographic characteristics of FSWs and computation of level of health behaviour change, the dependent variable of this study.

Bivariate analysis was performed using Pearsons chi-square test. Odds Ratio (OR) and 95% Confidence Interval (CI) were used to estimate the strength of association between a set of selected independent variables and behaviour change. The independent variables analysed included the socio-demographic characteristics, knowledge on HIV and AIDS, and engagement of FSWs in alternative IGAs. The threshold for statistical significance was set at $\alpha = 0.05$ and a two-sided p value at 95% confidence intervals (CI) reported for corresponding analysis.

All independent variables identified to significantly associate with behaviour change at bivariate analysis were considered together into a multivariate analysis. This was performed using binary logistic regression where backward conditional method was specified in order to identify confounders and effect modifiers. Adjusted Odds Ratios (adj. OR) with their respective 95% Confidence Interval (CI) were used to estimate the strength of association between the retained independent variables (parsimonious model) and behaviour change.

3.6 Ethical review

This research followed all the protocols of research and was presented to the institutional review board, specifically the AMREF in Kenya Ethics and Scientific Review Committee (ESRC) for approval. In addition, confidentiality of the respondents was assured by removing all the identifiers prior to data analysis and report writing. The respondents were assured that the information given would be treated with confidentiality and data collected will only be used for this research. All respondents were informed that they could withdraw consent at any time, and that withdrawal would not have any effect on the support they were currently receiving from AMREF. The participants were given a chance to ask questions or seek clarification at any point during the interview. Only those who gave consent were considered for the study interview.

4.0 RESULTS

The results are presented at three levels based on study objectives and method of analysis.

4.1 Socio-demographic characteristics and reasons for engaging in sex work

Socio-demographic characteristics

The final analysis focused on 159 female sex workers (FSWs) participating in the AMREF Maanisha Programme sites located in Nyanza and Western provinces (Table 1). The average age of the respondents was 31.4 years with a median and mode of 30 and 24 years, respectively. The youngest FSW interviewed was 15 years and the oldest was 55 years. The level of education was moderate, with slightly over a half (53%) of the FSWs having attained secondary level education and above. The majority (72%) were Protestant. Six (6) in every ten had at one time been married, with 3% still in a marital union. Among the formerly married, 20% had been widowed and 19% were each divorced or separated. Only 6% had no children. The mean number of children was 2.6. The minimum children ever had was zero, while maximum was 10. Four (4) in ten FSWs had been in the sex trade for more than five years compared to 57% who had been in it for less than five years (mean: 5.4 and range: 0.25-25 years).

The majority (84%) of study FSWs had participated in the Maanisha Programme for at least a year with a mean of 4.4 and range: 0.25-4 years. Almost three-quarters (73.4%) of the FSWs had not changed their town of residence, while 26.6% had moved mainly from Nairobi, Mombasa, Nakuru, Eldoret and Naivasha towns where they first began engaging in the sex trade. The respondents were involved in supporting the distribution of condoms (79.4%), peer education (75.5%), income generating activities (47.7%) and care and support (22.8%), all components of the Maanisha Programme.

Table 1: Socio-demographic characteristics of the study FSWs

Variable	Frequency n=159	Percentage (%)
1. Province		
Nyanza	110	69.2
Western	49	30.8
2. Age groups		
≤30 years	87	54.7
>30 years	72	45.3
3. Level of education		
None/ Primary Education	75	47.2
Secondary/ College	84	52.8
4. Religious affiliations		
Protestant	115	72.3
Catholic	33	20.8
Other (Muslims, Roho, Nomiya)	11	6.9
5. Marital status		
Single	62	39
Married	5	3.1
Formerly married	92	57.9
6. Ever had children		
Yes	151	94.4
No	9	5.6
7. Children born		
≤ 2 children	93	58.5
3 and above children	57	35.8
Not applicable	9	5.7
8. Period involved in sex work (in years)		
Less than 5 years	90	56.6
5 years and above	64	40.3
Not stated	5	3.1
9 When joined Maanisha Programme		

< one year of participation	22	13.9
1-2 years of participation	84	52.8
3 and above years of participation	50	31.5

The study FSWs were drawn from 15 community-based organisations formed based on their age distribution. Two groups had a median age of over 40 years with the exception of isolated outliers as illustrated in Figure 3.

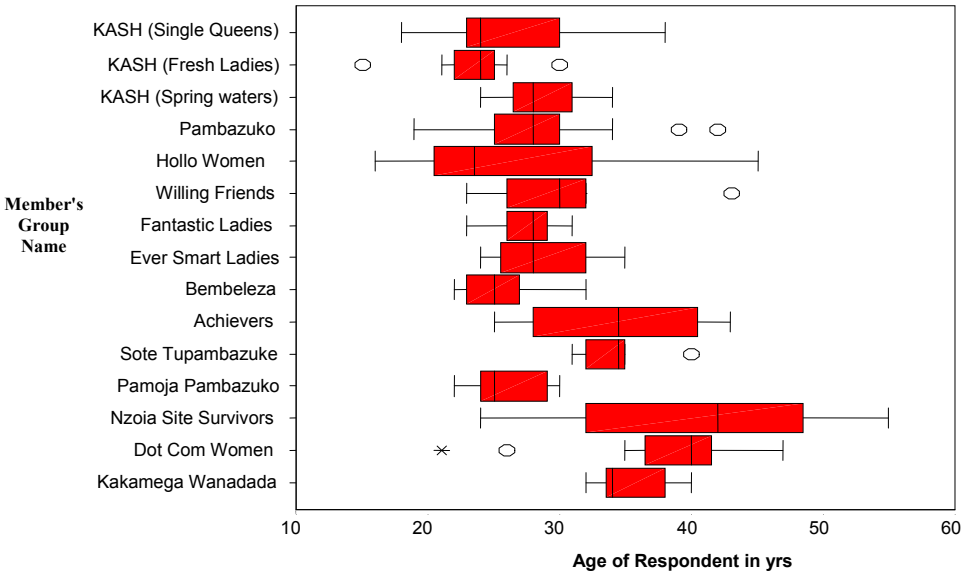

Fig 3: Age of FSWs by group

Reasons for engaging in sex work

The respondents were asked to give reasons for choosing commercial sex work. Their responses ranged from social, economic to behavioural and personal reasons. Adverse poverty *vis-a-vis* the burden to provide and care for their dependants amidst unemployment led to the FSWs' choice of an immediate, easily available alternative; sex work. The economic constraint as a "push" factor into commercial sex work was cited by 94% of the study FSWs. This was distantly followed by peer influence, strong desire/urge for sexual intercourse, and neglect/rejection by parents or husband (Figure 4).

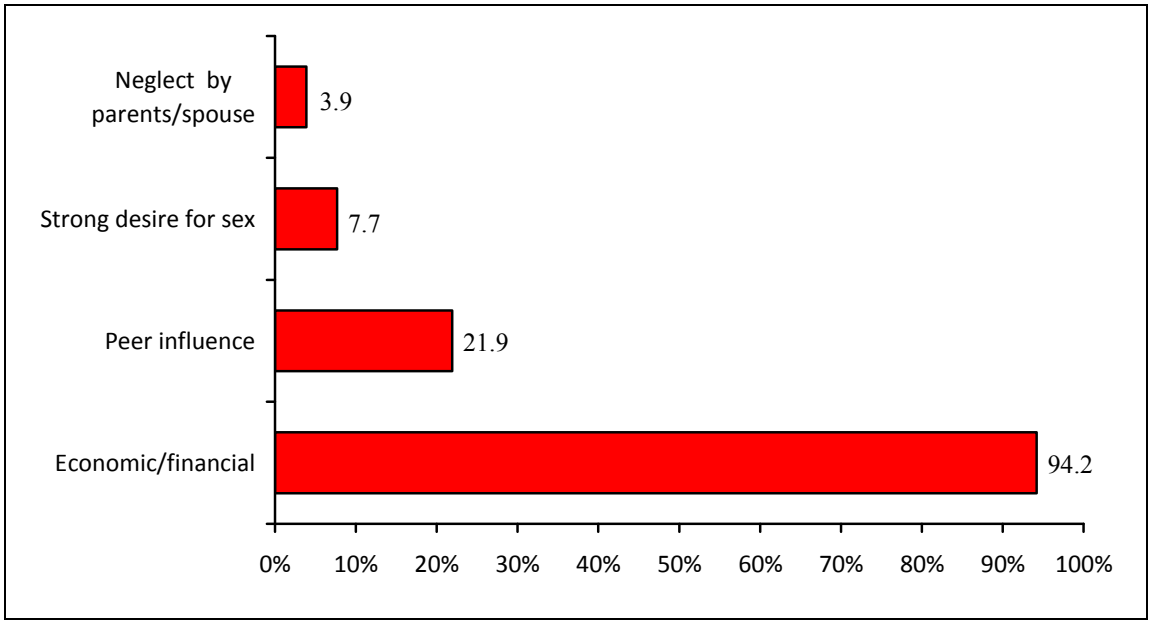

Fig 4: Reasons for engaging in sex work

The reasons were affirmed in all the three focus group discussions held. Demographic events such as divorce, separation and death of husbands were the most common reasons leading to commercial sex work. There was consensus during the FGDs that widowers, divorcees and unmarried ladies were the most likely group to engage in commercial sex compared to women in marital unions. Almost all FSWs began their stories with the statement: "*After separating with my husband or after the death of my husband I became desperate, lonely and subsequently resorted to commercial sex work ...*" explained a CSO project staff during an in-depth interview.

An FGD respondent confessed that *chang'aa* brewing led to her becoming addicted to alcohol. This was followed by police harassment, *"forcing her to quit brewing and engaging in sex work"*. Neglect due to polygamy or excessive use of alcohol by husbands was cited as a reason why the married ladies engaged in sex work. Others reasons cited included the nature of work/employment and peer influence. During an FGD, a sex worker confessed that, *"I was employed as a bar maid. After 11.00 pm when the bar closes, I would engage in commercial sex due to a ready market. This supplemented the meagre pay I received from working in the bar."* Another one explained that, *"I was selling foodstuffs to truck drivers which later resulted in engaging in sex with them"*. Finally, some sex workers engaged in sex for personal pleasure as

reported by one respondent; *"All I wanted was to derive pleasure from sex, but I was also happy to earn a living from it too."*

4.2 Behaviour change among FSWs

Behaviour change among FSWs was the central focus of the study. It was analysed through the respondent's adoption level to a set of safe sex practices. In order to estimate the risk reduction that would result in measuring behaviour change among participating FSWs, consistent condom use and reduction of clients were used as indicators in the study. Respondents were asked to indicate the frequency of protected sex with a regular and non-regular partner. They were also asked to state the number of clients they had each a week.

Consistent condom use resulting in safer sex was defined as the use of a condom (always) during sexual intercourse. Consistent condom use with non-regular clients was declared by 74.8% of the respondents, 21.1% were inconsistent and 4.1% did not use the condom at all. The proportion of consistent condom use dropped to 64.2% with regular clients while 24.5% were inconsistent and 11.3% never used condoms with regular clients.

The respondents were further asked to state what they would do if a client refused to use a condom. Refusal to have sex with the client was declared by 73.5% of the FSWs. This is a safe health practice. However, 15.5% indicated that they charged higher fees, while another 9.7% either did not know what to do or did nothing. Additionally, one FSW reported that she would engage in anal sex while another two indicated they will confess their HIV positive status as a negotiation strategy[2]. Three other FSWs reported that they would insert the female condom if the clients declined to use a male condom; this was another safe health practice.

Regarding the average number of sex clients per week, figures ranged from 0 to 21, with a median of 5. However, the regular sex customers per FSW were low; and the mean was 2.22, range of 0 to 16 and a mode of 1. There was one outlier who reported having 16 clients per week. This question was not applicable to five respondents because they had stopped engaging in commercial sex work.

[2] During the survey, 19 FSWs (11.9%) participating in the study revealed that they were HIV-positive

Ultimately, the median score on overall behaviour change was 10 points out of a possible 14. Thirty-two (32) FSWs scored the maximum 14 points compared to one who scored 3 points out of a possible minimum of zero. The results indicate that 59.1% of the FSWs reported good health behaviour change practices by scoring 10-14 points while 35.8% were at the transitional stage, scoring 6-9 points. However, 5.1% of the FSWs exhibited no change in behaviour having scored an aggregate of less than 6 points (Figure 5).

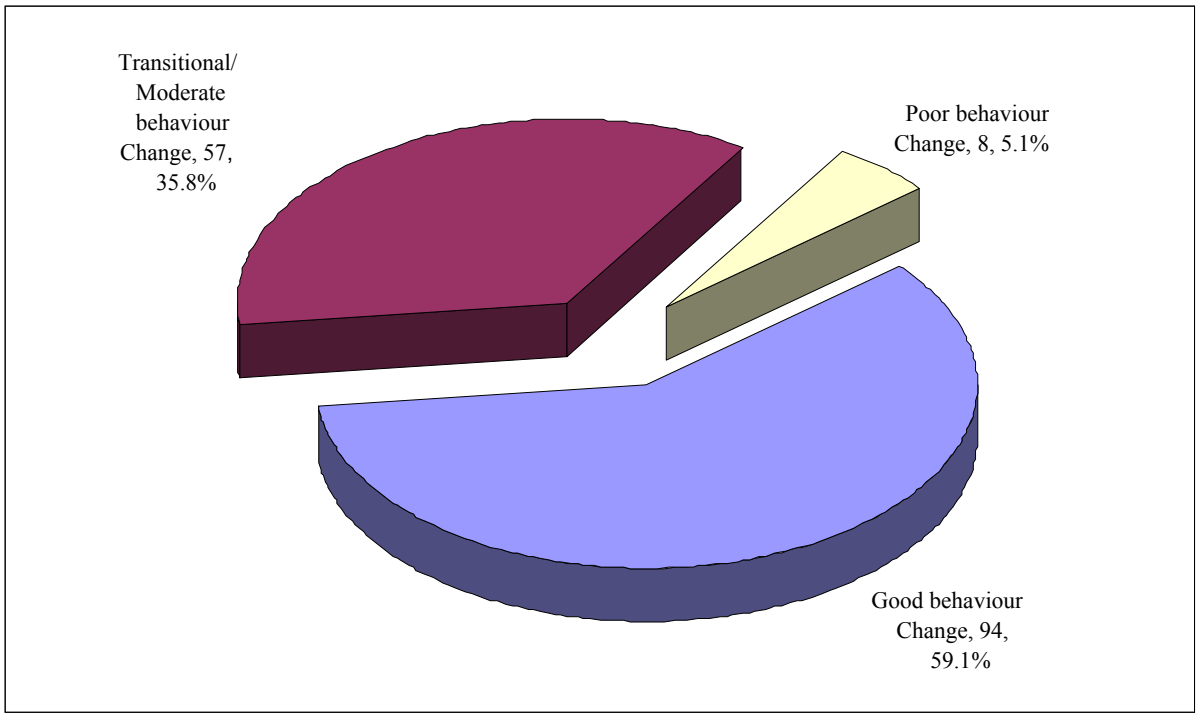

Fig 5: Level of behaviour change among FSWs

The FSWs in the good behaviour change category exhibited practices devoid of exposure to HIV infection risks. On the contrary, those in the transitional stage were not consistent in avoidance of HIV risk practices, and were ultimately still exposed to HIV infection. Thus, in subsequent analysis, the poor and transitional/moderate categories were combined into one segment that accounted for 40.8%, mainly because they were both at risk of HIV infection.

This result on level of behaviour change was corroborated during the focus group and in-depth interviews. For example, one FGD participant summed it up by stating: *"The best thing a sex worker can do is to reduce the number of sexual partners. We can only stop the practice completely if we secured well paying jobs or stable businesses."* Indeed there was consensus in all FGDs that the FSWs had reduced the number of sex partners, with some having quit the trade. *"...one of the former FSWs is now a Bishop in a local church and she is a good role model of behaviour change among FSWs!"* exclaimed an FGD participant.

4.3 Behaviour change in relation to selected socio-demographic characteristics

Relationships between selected demographic characteristics and behaviour change are shown in Table 2. Place of residence was significantly associated with behaviour change (P=0.014). Respondents residing in Western Province (73.5%) were 2.48 times more likely to attained good behaviour change compared to those residing in Nyanza Province (52.7%).

There was a significant association between age of the respondents and behaviour change (P=0.037). Majority of the respondents aged above 30 years (68.1%) attained good behaviour change compared to those aged 30 years and below (51.7%). Older FSWs (> 30 years) were 1.99 times more likely to attain good behaviour change compared to younger FSWs (≤ 30 years).

Level of education acquired was a significant factor to behaviour change among the FSWs (P=0.003). Majority of the respondents with secondary/tertiary education (70.2%) were 1.41 times more likely to attain good behaviour change compared to those without or with primary education (46.7%). Secondary/college predisposed the FSWs 1.41 times to good behaviour compared to none/primary.

Table 2: Relationship between behaviour change and selected socio-demographic variables

	Good behaviour change		Poor/moderate behaviour change			95% CI of OR		
Variables	**n=94**	**%**	**n=65**	**%**	**OR**	**Lower**	**Upper**	**P value**
Place of residence								
Western	36	73.5	13	26.5	2.48	1.19	5.19	**0.014**
Nyanza	58	52.7	52	47.3	1.00			
Level of education								

Secondary/college	59	70.2	25	29.8	2.70	1.41	5.18	**0.003**
None/primary	35	46.7	40	53.3	1.00			
Religious affiliations								
Other	8	72.7	3	27.3	4.67	0.87	27.95	**0.038**
Protestant	74	64.3	41	35.7	3.16	1.32	7.65	**0.004**
Catholic	12	36.4	21	63.6	1.00			
Marital status								
Ever married	41	42.3	56	57.7	1.16	0.60	2.22	0.656
Single	24	38.7	38	61.3	1.00			
Ever had own children								
Yes	89	59.3	61	40.7	1.17	0.30	4.52	0.823
No	5	55.6	4	44.4	1.00			
Number of children								
3 and above children	35	61.4	22	38.6	1.15	0.59	2.25	0.686
At least 2 children	54	58.1	39	41.9	1.00			
Not applicable	5	55.6	4	44.4				
Years with Maanisha Programme								
2 years and above	51	66.2	26	33.8	1.78	0.94	3.38	**0.077**
Below 2 years	43	52.4	39	47.6	1.00			
Period involved in CSW								
> 4 years	54	69.2	24	30.8	2.31	1.21	4.41	**0.011**
$\leq$ 4 years	40	49.4	41	50.6	1.00			
Average number of sex clients per week								
7 clients and above	34	65.4	18	34.6	1.39	0.69	2.77	0.355
Up to 7 clients	60	57.7	44	42.3	1.00			
Not applicable	0	0.0	3	100.0				

The relationship between the number of years with Maanisha and behaviour change was almost statistically significant (P=0.077). Majority of the clients (66.2%) who had been involved in Maanisha for two years or more were 1.78 times more likely to attain good behaviour change compared to those with less than two years (52.4%).

Other selected factors such as marital status, whether one had children or not, number of children, and average number of sex clients per week were not significantly associated with behaviour change (P>0.05).

4.4 Behaviour change in relation to knowledge on transmission and prevention of HIV

Relationships between knowledge on transmission and prevention of HIV and AIDS and behaviour change are shown in Table 3. There was no significant association between knowledge on transmission and behaviour change (P=0.153). However, majority of the respondents (60.6%) who scored 'moderate' as far as knowledge on transmission is concerned were 3.59 times more

likely to attain good behaviour change compared to those who scored 'poor' (30.0%). The likelihood increased slightly to 3.72 for those who scored 'good' (61.4%).

Table 3: Relationship between behaviour change and knowledge on transmission and prevention of HIV and AIDS

	Good behaviour change (n=94)		Poor/moderate behaviour change (n=65)			95% CI		P
Variables	**N**	**%**	**n**	**%**	**OR**	**Lower**	**Upper**	**value**
Knowledge on transmission								
Good	51	61.4	32	38.6	3.72	0.78	19.79	0.088
Moderate	40	60.6	26	39.4	3.59	0.74	19.53	0.092
Poor	3	30.0	7	70.0	1.00			
Knowledge on prevention								
Good	22	81.5	5	18.5	5.22	1.62	17.90	**0.002**
Moderate	40	64.5	22	35.5	2.16	1.01	4.63	**0.031**
Poor	32	45.7	38	54.3	1.00			
Total score on knowledge								
Good	37	71.2	15	28.8	3.14	1.05	9.58	**0.055**
Moderate	46	56.1	36	43.9	1.63	0.60	4.41	0.292
Poor	11	44.0	14	56.0	1.00			

Knowledge on prevention was significantly associated with behaviour change (P=0.003). Respondents who scored 'moderate' as far as knowledge on prevention is concerned (64.5%) were 2.16 times more likely to attain good behaviour change compared to those who scored 'poor' (45.7%). The likelihood increased significantly to 5.22 for those who scored 'good' (81.5%).

A combined score on knowledge on transmission and prevention of HIV and AIDS was marginally associated with behaviour change (P=0.055). Respondents who scored 'moderate' as far as knowledge on transmission and prevention of HIV and AIDS is concerned (56.1%) were 1.63 times more likely to attain good behaviour change compared to those who scored 'poor' (44.0%). The likelihood increased to a significant high of 3.14 for those who scored 'good' (71.2%).

4.5 Behaviour change in relation to engagement in alternative IGA

Engagement in alternative IGAs was significantly associated with behaviour change (P=0.008). FSWs who were engaged in alternative IGAs (65.3%) were 2.65 [95% CI=1.28 – 5.49] times more likely to attain positive behaviour change compared to those that were not engaged in any (41.5%). This result was supported during the FGDs where one participant said, "… *I usually tell my clients who do not want to use condoms that let the sex stay, I will harvest my maize in the farm…*". Another client who had stopped the sex trade said, *"... once the project assisted me with farm inputs, I changed my behaviour and I'm now a role model for HIV-positive women ..."*

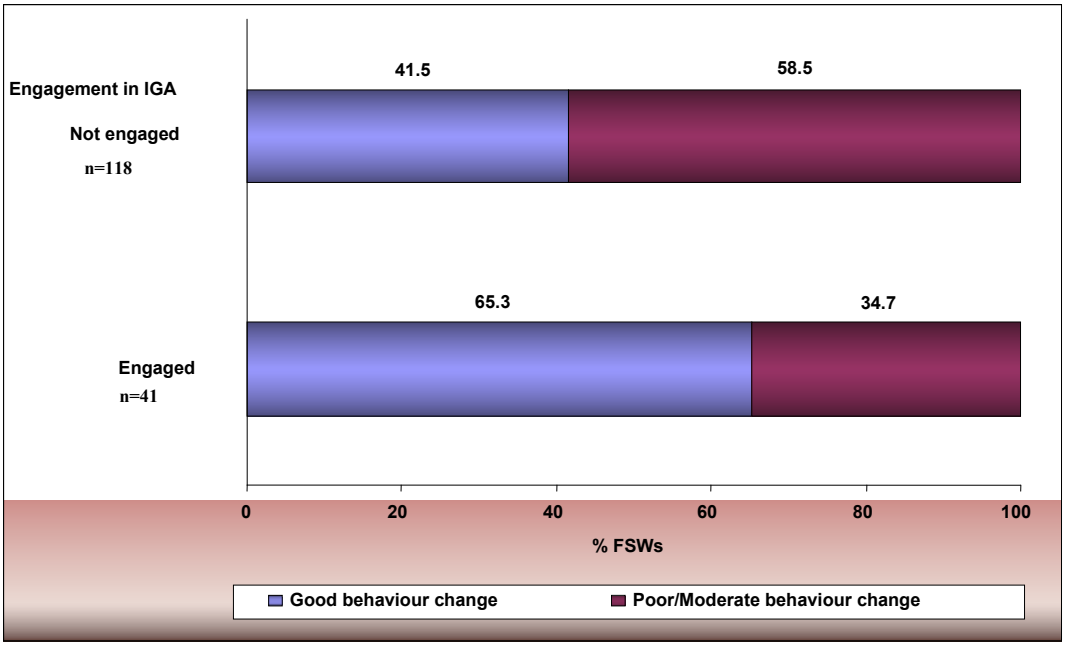

Fig 6: Relationship between behaviour change and engagement in alternative IGAs

4.6 Multivariate analysis

Binary logistic regression was used to model behaviour change (0=poor/moderate, 1=good) using six candidate predictive factors, namely:

- Place of residence (1=Western Province, 2=Nyanza Province)
- Age of the respondent (1= above 30 years, 2= 30 years and below)
- Level of education (1= secondary/college, 2= none/ primary)
- Religion (1= other, 2=Protestants, 3=Catholic)
- Years with Maanisha (1=2 years and above, 2= below 2 years)

- Period involved in sex work (1= more than 4 years, 2= 4 years and below)

These factors were significantly associated (independently) with behaviour change at bivariate analysis. Five successive iterations were performed using backward conditional method in order to eliminate confounders and effect modifiers. Four factors were identified to be the independent predictors of behaviour change. The resulting parsimonious model is shown in Table 4.

Table 4 shows beta coefficient (β), standard error of beta (s.e. (β)), adjusted odds ratio with their respective 95% confidence interval and P value for each of the factors significantly associated with client's behaviour change.

Adjusting for religion affiliation, period of involvement in FSW, knowledge on prevention of HIV and AIDS and engagement in alternative IGA, level of education was significantly associated with FSWs' behaviour change (P=0.035). A sex worker with secondary/tertiary level of education was 2.32 times more likely to attain good behaviour change compared to one with none/primary level of education.

Table 4: Logistic regression predicting behaviour change using level of education, religious affiliations, period involved in CSW, knowledge of prevention of HIV and AIDS and engagement in alternative IGAs

				95.0% C.I. for adj. OR		
Predictor variables	**B**	**s.e. (β)**	**Adj. OR**	**Lower**	**Upper**	**P value**
Constant	-2.81	0.67	0.06			**<0.001**
Level of education[1]						
Secondary/tertiary	0.80	0.38	2.23	1.06	4.69	**0.035***
Religion affiliation[2]						**0.004***
Other	1.53	0.85	4.61	0.87	24.27	0.072
Protestant	1.62	0.49	5.07	1.95	13.16	**0.001***
Period involved in CSW[3]						
> 4 years	0.86	0.38	2.36	1.12	5.00	**0.025***
Knowledge on prevention[4]						**0.032***
Good	1.47	0.63	4.37	1.26	15.11	**0.020***
Moderate	0.71	0.39	2.04	0.95	4.38	0.068

Engagement in IGA[5]						
Engaged	0.83	0.43	2.30	0.98	5.38	0.054

[1] - Reference category used, **'< Secondary'**
[2] - Reference category used, **'Catholic'**
[3] - Reference category used, **'≤ 4 years**'
[4]- Reference category used, **'Poor**'
[5]- Reference category used, **'Not engaged**'
*-Significant at 0.05 level

Adjusting for level of education, period of involvement in sex work, knowledge on prevention of HIV and AIDS and engagement in alternative IGAs, there was a significant association between religious affiliation and FSWs' behaviour change (P=0.004). Considering Catholic as the reference category, FSWs affiliated to other faiths were 4.61 times more likely to attain a positive behaviour change compared to those affiliated to the Catholic faith (P=0.072). The likelihood increased significantly to 5.07 for those affiliated to the Protestant faith (P=0.001).

Adjusting for level of education, religious affiliation, knowledge on prevention of HIV and AIDS and engagement in alternative IGAs and period of involvement in sex work was significantly associated with FSWs' behaviour change (P=0.025). FSWs with more than four years in sex work were 2.36 times more likely to attain good behaviour change compared to those with less than four years.

Adjusting for level of education, religious affiliation, period of involvement in sex work and engagement in alternative IGAs, knowledge on prevention of HIV and AIDS was significantly associated with behaviour change (P=0.032). Considering 'poor' to be the reference category, clients with moderate knowledge on prevention of HIV and AIDS were 2.04 times more likely to attain a positive behaviour change compared to those with poor knowledge (P=0.068). The likelihood increased to a significant 4.37 for those with good knowledge on prevention of HIV and AIDS (P=0.020).

Adjusting for level of education, religious affiliation, period of involvement in sex work and knowledge on prevention of HIV and AIDS, there was a marginal significant association between engagement in alternative IGA and FSW's behaviour change (P=0.054). FSWs engaged in alternative IGAs were 2.30 times more likely to attain good behaviour change compared to those not engaged in any other alternative IGA.

This multivariate logistic regression model presented can be expressed by the following function:

Log 'Good behaviour change' = $\alpha + \beta_1$(A: Secondary/Tertiary) + β_2(B: Other) + β_3(B: Protestant) + β_4(C: > 4 years) + β_5(D: Good) + β_6(D: Moderate) + β_7(E: Engaged)

Log 'Good behaviour change' = -2.81 + 0.80*(A: Secondary/Tertiary) + 1.53*(B: Other) + 1.62*(B: Protestant) + 0.86*(C: > 4 years) + 1.47*(D: Good) + 0.71*(D: Moderate) + 0.83*(E: Engaged)

'Good behaviour change' = $(e)^{-2.81} \times (e)^{0.80*(A: Secondary/Tertiary)} \times (e)^{1.53*(B: Other)} \times (e)^{1.62*(B: Protestant)} \times (e)^{0.86*(C: > 4 years)} \times (e)^{1.47*(D: Good)} \times (e)^{0.71*(D: Moderate)} \times (e)^{0.83*(E: Engaged)}$

5. DISCUSSIONS

This study presents exploration on behaviour change among female sex workers participating in the Maanisha Programme. Among the respondents interviewed 59% (n=94) were considered to have adopted positive health behaviour practices. This level compares favourably with the 40% level found in the Democratic Republic of Congo (Kayembe *et al*, 2007) and unfavourably with the 95% of CSWs reported in Senegal (Wang *et al*, 2007). Lack of baseline statistics makes it impossible to compare the proportion of FSWs with good behaviour practices at initiation of the Maanisha Programme. In the present study, the characteristics of FSWs who practised positive behaviour change were similar to those who did not.

Adverse poverty and personality issues were mentioned as the main reasons that pushed the respondents to take up the sex trade as a source of livelihood. These reasons for engaging in commercial sex work were similar to those found in previous studies (Nyzuko *et al*, 1991; Jitta & Okello, 2010; Elmore-Meegan *et al*, 2004; Hong, 2008; Chiao *et al*, 2007). Any efforts to reduce uptake of sex work should aim at addressing such push factors.

The cross-sectional survey was based on a snowball sample, a method widely used for surveys related to commercial sex work and men who have sex with men (Bochow *et al*, 1994). This is as a result of difficulties in recruiting a sufficiently large sample of FSWs using representative general population-based surveys. The study, however, took advantage of the partnerships that the Maanisha Programme had built with CBOs run by the commercial sex workers where the first FSW contact was asked to identify her colleague. This had a selection bias that may result in over-estimation of health behaviour change among FSWs.

The behaviour change indicator used in this study was constructed based on responses to 10 questions related to changes in behaviour upon initiation and participation in the Maanisha Programme. Only participants who scored at least 7 out of a possible 10 points were classified as having a positive health behaviour change. The definition of behaviour change was restricted to the information collected as responses to the questions asked in the interview schedule. No additional information was collected concerning the sex partners, except on what the FSWs would do when their clients refuse to use a condom. The influence of alcohol and drug use among the FSWs was unexpectedly not captured, yet it is instrumental in determining safe sex practices (Qing *et al*, 2010). It was therefore not possible to determine whether there was an association between alcohol use and adoption of positive health behaviour change. Further, the power of negotiation for safer sex practices with both regular and non-regular partners, especially among the HIV-positive FSWs was not taken into account. This is pivotal in influencing behaviour change in issues of safe sex practices (Shannon & Csete, 2010).

The findings show that 6 in every 10 FSWs had adopted positive health behaviour change with about a third being in the transitional stage towards good behaviour change. This was not surprising given the level of FSW participation in the Maanisha Programme and access to information of the same from other sources. The group that is in the transitional stage as well as those who never use condoms (comprising about 40%) is at risk and may be trying to adopt safe sex practices. Nevertheless, these results highlight substantial risk behaviours. The focus was on FSWs who had intercourse with both regular and casual partners. Consistent use of condoms is an established method of curbing the spread of HIV to clients and from clients to FSWs.

A number of socio-demographic characteristics were associated with behaviour change in this study. However, unexpectedly, age was not one of them. A recent study on determinants of consistent condom use in the Democratic Republic of Congo (Kayembe *et al*, 2007) found that consistent use of condoms was associated with age and CSWs aged 20-44 years were more likely to be consistent users. The present study, however, confirms the positive association between duration in commercial sex work and behaviour change that was similarly found in the DRC study. It was striking to note that 3% of the FSWs were still in a marital union. It will be interesting to find out how this group of FSWs managed to continue with the sex trade and maintain their families.

As far as the FSWs' knowledge on HIV and AIDS was concerned, there exists better knowledge on the modes of transmission of the virus than on prevention. Peer education is a key component of the Maanisha Programme. Other studies (Chiao *et al*, 2007; Walden *et al*, 1999) found that the peer education strategy played a key role in providing adequate knowledge for behaviour change among FSWs. It was surprising that the FSWs were conversant with the modes of HIV transmission, but not the range of preventive measures. This means there is a gap in the peer education programme of the Maanisha initiative. Condom use is the main preventive measure known by the FSWs. This may be partly because of the encouragement of FSWs to use and distribute condoms over other preventive measures. This finding is comparable to that found in a study carried out by Walden *et al* (1999) in which CSWs through their peer education project were encouraged to use and distribute condoms. Further, whereas the peer education activities are in place targeting FSWs, the mass media, especially radio, was cited by majority of respondents as a key source of HIV and AIDS information.

In the context of safe sex practices, the study FSWs like in previous studies promote condom distribution and their use, as well as reduced sex partners (Walden *et al*, 1999; Kayembe, 2007; Wang *et al*, 2007; Thomsen *et al*, 2006). Having a quarter of the FSWs using condoms inconsistently with sex partners is a clear avenue for increased spread of HIV. Equally, positive attributes such as the FSWs who would opt to use the female condoms when their male partners were reluctant to use the male condom is something that should be supported and encouraged in the project. It is an approach that can increase consistent use of condoms with all sex partners

resulting in the potential reduction of unprotected sex among sex workers (Thomsen *et al*, 2006). Conversely, 15% of FSWs charged more for those clients who refused to use a condom. While this appeared an option chosen by a significant proportion of study FSWs, it has high health risks and ramifications, especially on increased spread of HIV. Other studies (Kaddumukasa & Gawaya, 1996) had similar findings. Further, anal sex was mentioned as an alternative offer to clients who declined to use condoms. This equally increases the chances of HIV infections as previous studies among men who have sex with men had found (Elford *et al*., 2009; Folch *et al*, 2009; Tripathi *et al*, 2009). Measures that aim to correct such misinformation among FSWs participating in the Maanisha Programme are recommended.

Substantial amount of resources had been directed towards provision of capacity to starting alternative IGAs as sources of income for the FSWs. This was in terms of vocational training (skills development and re-orientation towards an IGA mindset) and provision of start-up inputs including equipment and money. Other studies (Kaddumukasa & Gawaya, 1996; Jitta & Okello, 2010) had similarly used the same strategy to reach out to the FSWs with alternative means of obtaining income for their livelihood. However, the effectiveness and sustainability of such interventions need to be understood through further research.

6. CONCLUSIONS & RECOMMENDATIONS

The females who sell sex are often poorer, less educated and deprived of family support. Among the female sex workers who participated in this study, poverty, divorce and death of husband were the main reasons for engaging in the sex trade. Their motivation for sex work was to earn money. Sex work is work; this is an income-generating activity and a way of surviving. It is a means of ensuring that the women are able to earn some money for food, shelter and to meet other basic needs. Substantial good health behaviour change has been achieved among some FSWs (59.1%) participating in the Maanisha Programme. However, a significant proportion of the sex workers were at their transitional stage of behaviour change. The multivariate regression model attests that good behaviour change was associated with level of education, religious affiliation, number of years in sex work, knowledge on prevention of HIV, and engagement in alternative IGAs. The study thus rejects the null hypothesis that FSWs' socio-demographic characteristics, knowledge on HIV and engagement in alternative IGAs have no association with behaviour change.

Commercial sex work can be reduced if FSWs had access to alternative sources of income. It is therefore, recommended that the Maanisha Programme strengthens access to alternative sources of income for the sex workers, support those who are unable to start one and encourage them to continue forming groups that can be considered for financing. The peer education initiative needs to re-orient its focus to include preventive measures, and go beyond the importance of condoms.

Currently, the FSWs are provided with male condoms whose use largely depends on the male partner's co-operation. This leaves the FSWs with the option of negotiating for safer sex which at times may not be effective, thus resulting in increased risky behaviour. It is therefore, recommended that the FSWs be provided with female condoms to ensure consistent use of condoms for safe sex practices and behaviour change. Every effort needs to be made to prevent those already infected (11%) from re-infection by integrating treatment and adherence to the programme.

There is need to understand how the children of FSWs cope with their mothers' lifestyles. The fact that some of the FSWs were currently married calls for a re-orientation of the Maanisha Programme design in addressing behaviour change among this subset of FSWs. This may entail drifting away from peer-to-peer education to couple counselling on the dangers of commercial sex.

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APPENDICES

Appendix 1: List of Districts covered by the Maanisha Programme

Nyanza South	16. Khwisero	**Rift Valley**
1. Borabu	17. Lugari	1. Kericho East
2. Gucha	18. Mt. Elgon	2. Nandi North
3. Gucha South	19. Mumias	3. Nandi South
4. Homa Bay	20. Sabatia	4. Nandi Central
5. Kisii Central	21. Samia	5. Tranzoia East
6. Kisii South	22. Teso North	6. Kipkelion
7. Kuria (East)	23. Teso South	7. Wareng
8. Manga	24. Vihiga	8. Tranzoia West
9. Marani		9. Bomet
10. Masaba	**Upper Eastern**	10. Eldoret West
11. Mbita	1. Isiolo	11. Buret
12. Migori	2. Meru South	12. Kwanza
13. Ndhiwa	3. Embu	13. Transmara East
14. Nyamache	4. Imenti North	14. Eldoret East
15. Nyamira	5. Igembe	15. Sotik
16. Nyatike	6. Imenti South	16. Nandi East
17. Rongo	7. Tigania	17. Tinderet
18. Suba	8. Mbeere	
	9. Meru Central	
Nyanza North	10. Tharaka	
1. Siaya	11. Garbatula	
2. Kisumu	12. Moyale	
3. Bondo	13. Laisamis	
4. Nyando	14. Marsabit	
5. Rachuonyo	15. Chalbi	
	16. Maara	
Western		
1. Bungoma	**Lower Eastern**	
2. Bungoma East	1. Mwala	
3. Bungoma North	2. Yatta	
4. Bungoma South	3. Kangundo	
5. Bungoma West	4. Kitui South	
6. Bunyala	5. Kitui	
7. Busia	6. Makueni	
8. Butere	7. Kibwezi	
9. Butula	8. Mwingi	
10. Emuhaya	9. Nzaui	
11. Hamisi	10. Mbooni	
12. Kakamega Central	11. Machakos	
13. Kakamega East	12. Kyuso	
14. Kakamega North		
15. Kakamega South		

Appendix 2: Coverage of Maanisha Programme in Kenya