



REPUBLIC OF KENYA

# KENYA

## HIV Prevention Response and Modes of Transmission Analysis

*March 2009*



The Global HIV/AIDS Program (GHAP)  
The World Bank



**UNAIDS**  
JOINT UNITED NATIONS PROGRAMME ON HIV/AIDS

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**Final Report**  
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**Kenya National AIDS Control Council**



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The World Bank Global HIV/AIDS Program (GHAP)  
Global AIDS M&E Team (GAMET)

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**Kenya**  
**HIV Prevention Response and Modes of Transmission Analysis**

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This study, and similar studies in Lesotho, Mozambique, Swaziland, Uganda, and Zambia is the outcome of close collaborative by a team in Kenya, with technical and financial support from the UNAIDS Regional Support Team for Eastern and Southern Africa, UNAIDS Geneva, and the World Bank's Global HIV/AIDS Program (Global AIDS Monitoring and Evaluation Team). The study entailed using existing data and collecting new data to better know the country's HIV epidemic, know the national HIV response and how funding was allocated, and compare them, so as to improve the HIV response and strengthen prevention based on evidence on what works to prevent new infections.

**Keywords:** Kenya, HIV, AIDS, epidemiology, epidemic, modes of transmission, incidence, prevalence, prevention, response Know Your Epidemic, Know Your Response, expenditures, synthesis, Kenya National AIDS Control Commission, UNAIDS, World Bank

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We are also gratified at the great interest taken in the production of this report, and the fact that even in draft form, the results reported herein were already being taken into consideration in Kenyan policy and planning discussions.

The Kenya Modes of HIV Transmission Study Technical Team  
Nairobi  
15 December 2008

## Executive Summary

In recent years, with the HIV epidemic in Kenya stabilising and treatment programs in place, questions have arisen as to whether sub-populations traditionally seen as at most risk of HIV are still the main sources of new infections. The importance of “knowing your epidemic” (KYE) and “knowing your response (KYR)” has become evident to target and improve HIV responses. The World Bank, UNAIDS and other agencies have initiated a series of HIV epidemiological and response syntheses in Africa, Asia and Latin America to KYE and KYR.

How does such a synthesis work? For the study in Kenya, HIV epidemiological data and incidence modelling data (from the UNAIDS Modes of Transmission Model) were analysed together to obtain an epidemiological synthesis (‘KYE synthesis’), while the HIV prevention review and resources data were analysed together to obtain an HIV response synthesis or “know your response” (KYR) synthesis. The two syntheses were then analysed together to understand the gaps in HIV prevention programming, leading to recommendations as to how the HIV response and its funding can be improved.

The Kenya Analysis of HIV Prevention Responses and Modes of HIV Transmission study (‘MoHT synthesis study’) was conducted from December 2007 to June 2008 by a team of three consultants, coordinated and supervised by the UNAIDS M&E Advisor and the Head of Policy, Research and M&E at NACC. Overall supervision came from the Monitoring and Evaluation Unit of the National AIDS Control Council (NACC), UNAIDS and the Global AIDS Monitoring and Evaluation Team (GAMET) of the World Bank. A Kenya MoT Technical Team - KMoTTT (the Technical Advisory Team) met regularly to review progress and provide additional suggestions and input.

### The Know Your Epidemic (KYE) Synthesis – Epidemiology and modelling

A review of the most recent HIV epidemiology data shows that heterosexual transmission remains the most prominent mode of transmission in all areas of Kenya. However, heterosexual transmission occurs in a variety of types of sexual encounters: between married couples or steady sexual partners, concurrent sexual partnerships (e.g. one person with both a steady, long-term partner and a casual partner, or one person with more than one steady partner), casual sexual partners, and a range of transaction-based sexual practices.

The incidence model confirms the data from both the epidemiology review and more recent surveillance. *The model estimates that in 2006 a total of about 76,300 new infections occurred<sup>1</sup> bringing the total number of adults aged 15-49 in Kenya infected with HIV to be about 1.2 million (the KAIS 2007 estimated the number to be 1.4 million).*

A significant proportion of new infections are arising not only in those who engage in casual heterosexual sex, either with sex workers or others -- there is an equally high (or possibly even higher) rate of incidence in the “partners of [people who have] casual heterosexual sex” and other steady partners. Despite regional variation, this holds true across the country, and it does beg the question of “who is infecting who?” *The incidence amongst the steady partners of people who have multiple partners demonstrates that those who are engaging in casual heterosexual sex are putting all of their partners – casual, regular, occasional, steady, long-term etc. - at risk.* The factors surrounding transmission within discordant couples need to be researched further.

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<sup>1</sup> Estimates of the number of new infections per year have ranged from 55,000 to 110,000, thus the figure of 76-77,000 fits very much within the range of probabilities

The model also demonstrated considerable variation across provinces, as seen in this table:

### National Incidence of HIV and % Incidence by Mode of Exposure for Kenya

Groups	Percent of New infections			
	National	Nyanza	Nairobi	Coast
Heterosexual sex within union/ regular partnership	44.1%	38.5%	37.4%	37.9%
Casual heterosexual sex	20.3%	30.5%	23.0%	14.9%
Sex workers and Clients	14.1%	23.1%	14.7%	18.2%
MSM and Prison	15.2%	6.0%	16.4%	20.5%
Injecting Drug Use (IDU)	3.8%		5.8%	6.1%
Health Facility Related	2.5%	1.9%	2.7%	2.3%
<b>Number of New Infections</b>	<b>76,315</b>	<b>25,195</b>	<b>10,155</b>	<b>6,656</b>

Sex workers (SWs) and truck drivers were initially identified as the core groups and bridge for the infection to spread to the general population, which gave rise to the generalised epidemic in Kenya. Today, at least in some provinces, these sub-populations remain important contributors to the epidemic.

However, there is now also evidence that men having sex with men (MSM), including those who are in prison, are a most-at-risk population that needs to be recognised in Kenya. The data around this community remain incomplete. The National Incidence Model indicated that MSM and prison populations accounted for 15.2% of new infections, while the model for Nairobi placed this group's contribution at 16.4% and in the Coast it was greater than 20%, representing one-fifth of new infections.<sup>2</sup> Data also indicate that a significant proportion of MSM in Kenya are not exclusively homosexual, and may even be married. Therefore the risk of wider spread of HIV beyond the MSM community is real, and this is a group that needs urgent intervention.

The number of IDUs in the population is low, and they are mainly concentrated in certain areas, specifically the capital city and coastal areas. However, this is a group with a high potential to transmit the disease, and this is reflected in the extremely high incidence rates in the model.

### What do we know about the HIV epidemic in Kenya?

Significant declines in HIV prevalence have occurred - a 50% drop in HIV prevalence in the past ten years. The decrease in prevalence is even more dramatic when seen in light of the significant increase in ARV treatment since 2001 that has resulted in a 29% decrease in the number of AIDS deaths over the last 7 years.<sup>3</sup> These factors may contribute to the recent rise of prevalence reflected in the 2007 KAIS results – further analysis of the final KAIS results may shed further light on this.

Despite national decreases in HIV prevalence, the HIV epidemic in Kenya is heterogeneous - the epidemic has different dynamics (and possibly different drivers) across the country including:

- **Sexual heterogeneity:** The revised 2007 KAIS preliminary estimates put HIV prevalence nationally at 5.5% in men and 8.8% in women aged 15-49 (and 5.4% and 8.4% respectively among the 15-64 age group). Among young women aged 15-19 the prevalence is 3.5% while it is only 1% for young men and among women aged 20-24 the prevalence is 7.4% while it is only 1.9% for the young men in the same age group.

<sup>2</sup> There are still unanswered questions, most importantly determining the number of HIV transmissions that occur in prison as opposed to the number of people who are already HIV-positive at the time of their incarceration.

<sup>3</sup> Fewer AIDS deaths mean more persons with older HIV infections stay alive and are reflected in total HIV prevalence rates – therefore, potentially, leading to a stabilisation or even increase in prevalence (even if the number of new infections decreases).

- There are a high number of discordant couples in Kenya: about 11% of couples in Kenya are living with HIV – among married individuals who are HIV-infected, 45% have a partner who is not currently infected.
- **Age-related heterogeneity** - young women aged 15-19 years are 3 times more likely to become infected with HIV than young men; women of 20-24 years are over 5.5 times more likely to become infected than their male peers. However, in some older age groups the gap narrows and in others men are more likely to be infected with HIV.
- **Geographic heterogeneity** - HIV prevalence varies significantly between provinces in Kenya, ranging from 0.81% in North-eastern, to 8.1% in Coast and 8.8% in Nairobi, and 14.9% in Nyanza, double the national average. Nyanza is the province most affected by HIV/AIDS, with an estimated 30% of the national burden. There is evidence of recent increases in incidence in the Rift Valley. The KAIS 2007 estimated that the Rift Valley and Nyanza account for close to 50% of the new infections.
- **Heterogeneity in some populations** - Some populations, such as sex workers, truck drivers, MSM, members of fishing communities, prisoners, and others where data exist, have HIV prevalence rates many times higher than the national average.

The estimated annual HIV incidence is around 0.5% -- this translates into 55,000 – 100,000 new infections per year.

### **What do we know about individual behaviours that have been assumed to impact on the spread of HIV in Kenya?**

- Sexual debut is mostly in the age group 15 to 19 years, with less than 25% using protection during first sex. Median age at first sex has shown a slight increase in the past 10 years, and is the same for men and women.
- The 2003 KDHS data suggest that inter-generational sex may not be as frequent or impacting as much as is thought to be the case.
- Male circumcision rates differ dramatically from region to region, and low circumcision rates in some provinces are associated with higher HIV prevalence.
- There are some strong indications that Kenyans are indeed changing their behaviour, at least as far as reducing their number of partners, but there is a continued low rate of condom use with non-regular partners and at the last higher risk sex.
- A reduction in the high rates of STIs in Kenya has been reported in recent years, especially among sex workers. But the KAIS 2007 detected a very high rate of HSV-2 infection in the general population.
- Sex workers and their partners remain a key population at risk of HIV infection, because of the frequency of concurrent partners and lack of consistent condom use. The clients of sex workers form a bridge population with the general population. More worrying than the high number of women who can be identified as sex workers are the even greater number of women, especially young women, who engage in “transactional sex” and at times in so-called “part-time” sex work. The 2003 KDHS noted that 16% of girls 15–19 report receiving money, gifts or favours for sex in the past 12 months.
- Two factors which are considered to be chief determinants of the HIV epidemic level in Kenya are strongly associated with culture: male circumcision and societal acceptance of concurrent/multiple partnerships.



## The Know Your Response (KYR) Synthesis – programmes and resources

The Kenya National AIDS Strategic Plan (KNASP) 2005-2010 has a strategy that promotes information, education and communication on HIV to the general population, the key messages being abstinence, delaying sexual debut, being faithful, using condoms consistently, engaging in safer sex, involving people with HIV to a greater extent, promoting counselling and testing, and ensuring the safety of the blood supply. Other important prevention strategies such as partner reduction, male circumcision and reducing stigma against most-at-risk populations are not explicitly mentioned as strategies in the KNASP. Promotion of circumcision has recently been promulgated, but not yet enacted as an additional HIV prevention policy.

Most districts in Kenya are covered with programmes of blood safety, universal precautions in health care settings, PMTCT, IEC on risk reduction, IEC on stigma and discrimination reduction, condom promotion, HIV testing and counselling, reproductive health services (including antenatal, delivery and postnatal care, STI treatment, and family planning) and school-based education.

Programmes not implemented in most districts include risk reduction for MSM and sex workers, HIV reduction in the workplace, male circumcision, harm reduction for IDUs and post-rape care. Programmes for specific vulnerable or at-risk populations (SWs, fishing communities, certain migrant labour groups) are being carried out at specific sites, either by NGOs or by research groups from Kenyan or international institutions, but these programmes are not widely supported, and not supported by government expenditure plans. Most organisations that implement HIV prevention programmes are civil society organisations.

The amount of total funding available at the national level for prevention activities has increased in the past few years, but the share has fallen to less than 25% of the total HIV and AIDS funding in the country, because treatment funding has increased much more.

Almost two-thirds of the prevention expenditures in 2006/2007 were on counselling and testing (38.9%), PMTCT (16.6%) and condom provision (5.7%), with minimal amounts spent on most-at-risk populations, not just marginalised groups such as sex workers or MSM, but also groups such as youth or PLHIV who have been identified in the KNASP as target populations for HIV prevention. Treatment of STIs is not recorded nationally as a prevention intervention despite many believing that even in the absence of empirical data of its effectiveness in reducing population incidence, there are valid arguments for its important role in prevention at the individual level, and its obvious health benefits. As well:

- Youth-oriented programmes claimed less than 5% of prevention resources
- While there are funds (8% of total) for behaviour change communication (BCC), there is hardly any funding aimed at mobilizing communities.
- 18% of the budget goes to “other prevention” activities which require further clarification and appropriate classification.
- HIV/AIDS financing in the country rests largely with the donor community who contribute over 95% of the HIV and AIDS allocation (including pledges).

There is a general lack of counselling, testing, treatment and prevention services aimed at youth, especially youth who are already HIV-positive. The distribution of testing sites is skewed; 60% are based in the urban and peri-urban areas where only 20-30% of the population live, while only 40% of the CT centres are found in rural Kenya where 70-80% of the population resides. Only 24% of the population (15+ years) know their HIV sero-status.

Based on what the modelling has shown, ***the most important most-at-risk populations that are NOT being adequately covered by the national prevention strategy include MSM, truck drivers, fishing communities, young women and girls, prisoners, and internally displaced persons.***

### **Linking the response to the epidemic – synthesising the results**

***Most new infections in Kenya occur in people who are engaging in casual sex with multiple partners, and in their steady partners who themselves may be monogamous.*** As well, certain populations are at higher risk, including those who are clients of sex workers and men who have sex with men. There is a high risk of transmission within prisons that is not being addressed.

Kenya has a mixed epidemic, thus activities are needed at a local level to understand, plan for, coordinate, implement, monitor and evaluate HIV responses. But the HIV response in Kenya has been driven mainly from the national level, with general and overarching programmes that have not focused on the unique needs of specific most-at-risk populations (with specific messages and approaches). These most-at-risk populations include persons in certain mobile occupations – such as fisher folk, truck drivers and sex workers. Messaging has been general, and not focused on the unique factors that may result in rising incidence in specific sub populations.

***The KNASP strategies and prevention policies do not fit with the epidemiological evidence in the areas of sexual behaviour and the messages being promoted for behaviour change.***

KNASP strategies seem to be directed toward safe sex interventions aimed at a few defined “most-at-risk” populations, and abstinence and faithfulness interventions targeted at youth. There do not seem to be many programmes aimed at that vast proportion of the population who are sexually active, and who are at risk because of the possibility that they or their partners have other sexual contacts. Condom promotion is not optimal. There are difficulties in promoting condom use within steady partnerships, and there are also difficulties in promoting condoms to youth at the same time as promulgating the virtues of abstinence. Empirical evidence is still lacking on behaviour change by the youth and others to effectively adhere to abstinence.

***Prevention for positives is a programme that needs expansion,*** especially in addressing issues of discordant couples. While the KNASP strategy calls for increased activities targeting vulnerable and most-at-risk groups such as SWs, MSM, truck drivers, etc. these programmes are mainly carried out sporadically by the CSOs and NGOs while the public sector services, such as health and education, have not yet officially integrated them in their systems.

### **Summary of Recommendations**

The recommendations focus on answering the question: “*What could Kenya do differently in its current HIV prevention strategies and prioritisation of allocation of resources?*”

#### **Change HIV prevention policies to:**

- a) Allow for more regional and decentralised HIV prevention responses.
- b) Discuss changes to policies and laws that criminalise and discriminate against most-at-risk populations.
- c) Develop mechanisms for registering sex workers to make it easier to offer them access to prevention interventions.
- d) Allocate more targeted percentages of funding for prevention, and treatment care and support - funding percentages for treatment and prevention need to be revisited so that areas

with highest prevalence receive balanced funding for prevention and treatment, whereas areas with lower prevalence receive more funding for HIV prevention than for treatment.

- e) Improve resource flows and AIDS expenditure tracking systems.
- f) Strengthen provincial and district links to the NACC and strengthen DHMTs to support effective design and implementation of decentralised response plans, and improve capabilities of programme planners at the provincial and district levels to interpret and use research and surveillance data.
- g) Consider the development of robust, flexible and relevant national and sub-national response strategies and plans that allow for efficient implementation of interventions, increase accountability among implementers and improve co-ordination mechanisms.

#### **Change HIV prevention programmes to:**

- a) Focus on the most-at-risk populations, including fisher folk, sex workers, truck drivers, couples in steady and non-steady unions, MSM, IDUs, men and women with multiple partners, pregnant women, as well as rural males and females in high prevalence districts, and girls and young women under the age of 25.
- b) Strengthen prevention programmes for HIV positive persons, discordant couples as well as couple-based HIV prevention programs.
- c) Roll out the male circumcision policy.
- d) Increase service provision to MSM, IDUs, other drug users, sex workers and other most-at-risk populations.
- e) Scale-up and improve quality of PMTCT services and widen coverage.
- f) Strengthen and expand STI diagnosis and treatment programmes.
- g) Focus on changing social norms around multiple/concurrent partnerships.

#### **Improve strategic information for HIV prevention by:**

- a) Undertaking more research in the following areas
  - sexual behaviour in specific communities, e.g. fishing communities
  - behavioural research around multiple concurrent partnerships
  - formative research to understand size, location, behavioural and demographic features of the MSM and IDU communities
  - factors explaining the high prevalence among female widows/separated/ divorced
  - utilisation of services by geography and client population
  - socio-anthropological research into cultural issues requiring behaviour change.
- b) Improve access to research results, and interpretation of those research results into understandable knowledge that most implementers can interpret and utilise
- c) Establish a Documentation Centre in NACC as a collection and ready access point for all relevant information
- d) NACC to regularly analyse and evaluate VCT, PMTCT and other national programmes.
- e) Improve ways in which social norms and changes in social norms, can be measured and tracked over time, to assess whether changes in social norms are indeed taking place.

Recommended geographic areas for increased coverage include: Nyanza, Nairobi, Western, Rift Valley and Coastal provinces – focusing on specific most-at-risk populations and communities, and along all the major trucking routes.

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## Acronyms

<b>AIDS</b>	- Acquired immunodeficiency syndrome	<b>KYR</b>	- Know your response
<b>ANC</b>	- Antenatal clinic	<b>M&amp;E</b>	- Monitoring and evaluation
<b>ART</b>	- Antiretroviral therapy	<b>MC</b>	- Male circumcision
<b>ARVs</b>	- Antiretroviral drugs	<b>MoEST</b>	- Ministry of Education, Science and Technology
<b>BCC</b>	- Behaviour change and communication	<b>MOH</b>	- Ministry of Health
<b>BSS</b>	- Behavioural surveillance study	<b>MSM</b>	- Men who have sex with men
<b>CBS</b>	- Central Bureau of Statistics	<b>MOHT</b>	- Modes of HIV transmission
<b>CDC</b>	- Centres for Disease Control	<b>NACC</b>	- National AIDS Control Council
<b>CHS</b>	- Casual heterosexual sex	<b>NASA</b>	- National AIDS Spending Assessment
<b>CI</b>	- Confidence interval	<b>NASCOP</b>	- National AIDS and STI Control Programme
<b>CSO</b>	- Community service organisation	<b>NGO</b>	- Non-government organisation
<b>CT</b>	- Counselling and testing	<b>NVP</b>	- Nevirapine
<b>DFID</b>	- Department for International Development (UK)	<b>OVC</b>	- Orphans and vulnerable children
<b>DHMT</b>	- District health management team	<b>PATH</b>	- Programme for Appropriate Technology in Health
<b>DHS</b>	- Demographic and Health Survey	<b>PEP</b>	- Post-exposure prophylaxis
<b>ELISA</b>	- Enzyme linked immunoassay	<b>PEPFAR</b>	- President's Emergency Plan for AIDS Relief
<b>FHI</b>	- Family Health International	<b>PLWHA</b>	- Person living with HIV & AIDS
<b>FP</b>	- Family planning	<b>PMTCT</b>	- Prevention of mother-to-child transmission
<b>FSW</b>	- Female sex worker	<b>PSI</b>	- Population Services International
<b>GAMET</b>	- Global AIDS Monitoring and Evaluation Team (World Bank)	<b>RCT</b>	- Randomised controlled trial
<b>GDP</b>	- Gross domestic product	<b>RH</b>	- Reproductive health
<b>HIV</b>	- Human immunodeficiency virus	<b>STI</b>	- Sexually transmitted infection
<b>HR</b>	- Human resources	<b>SW</b>	- Sex worker
<b>HSV</b>	- Herpes simplex virus	<b>TB</b>	- Tuberculosis
<b>IDP</b>	- Internally displaced person	<b>UNAIDS</b>	- Joint United Nations Programme on HIV & AIDS
<b>IDU</b>	- Injection drug use	<b>UNFPA</b>	- United Nations Family Planning Association
<b>IEC</b>	- Information, education, communication	<b>UNGASS</b>	- United Nations General Assembly Special Session
<b>IgG</b>	- Immunoglobulin G	<b>UNHCR</b>	- United Nations High Commission for Refugees
<b>JAPR</b>	- Joint Annual Programme Review	<b>UNICEF</b>	- United Nations International Children's Emergency Fund
<b>JICA</b>	- Japan International Cooperation Agency	<b>USAID</b>	- United States Agency for International Development
<b>KAIS</b>	- Kenya AIDS Indicator Survey	<b>USG</b>	- United States Government
<b>KDHS</b>	- Kenya Demographic and Health Survey	<b>VCT</b>	- Voluntary HIV counselling and testing
<b>KEMRI</b>	- Kenya Medical Research Institute	<b>WHO</b>	- World Health Organisation
<b>KEMSA</b>	- Kenya Medical Stores		
<b>KMoTTT</b>	- Kenya Modes of Transmission Technical Advisory Team		
<b>KNASP</b>	- Kenya National AIDS Strategic Plan		
<b>KYE</b>	- Know your epidemic		

## CHAPTER 1. INTRODUCTION, METHODOLOGY AND HYPOTHESIS

### 1.1. HIV Prevention and Modes of HIV Transmission (MoHT) Analysis Concept

In 2007, an estimated 33.2 million people in the world were living with HIV,<sup>4</sup> and despite twenty years of prevention programmes, an estimated 2.5 million new infections occurred in that year. Underpinning the shortcoming in the prevention response is the inadequate use of evidence to inform the response. The result has been largely ineffective prevention interventions, with non-optimal use of available resources and the loss of early opportunities to address the unique factors driving infection in the populations most at risk within the country.

The importance of “knowing your epidemic” has become evident and UNAIDS and the World Bank have initiated a series of epidemiologic synthesis studies in a number of countries in Africa, Asia and Latin America to address questions of whether those groups who have traditionally been at risk are still the source of new infections.

HIV prevalence is not an ideal measure to understand current transmission dynamics<sup>5</sup> for a number of reasons, including the fact that decreases in prevalence<sup>6</sup> do not necessarily indicate a reduction in risk of infection.<sup>7</sup> Changes in prevalence lag behind real changes in risk because of the relatively long survival time of people infected with HIV (particularly since the introduction of antiretroviral drugs). Surveillance systems primarily rely on HIV prevalence data collected from women attending selected antenatal clinics (ANC) or PMTCT sites. The interpretation of ANC clients data is complicated by natural epidemiological changes that arise from the long and variable incubation of HIV and AIDS-related mortality,<sup>8</sup> by biases in the sample due to lowered fertility associated with bacterial STIs and HIV,<sup>9</sup> by the selection bias in surveying pregnant women (who had unprotected sex, a higher risk behaviour), and by the disproportionate selection of surveillance sites in urban areas.<sup>10</sup> Other prevalence estimates using population-based HIV prevalence surveys are also limited, in that they may not be generalised beyond the specific group being surveyed (defined by occupation, geography, age, etc) to the wider population and are biased by non-response in the survey.

A better measure for monitoring the HIV epidemic is *incidence* (rate of new infections over a specific period of time). If the incidence is known, temporal changes in the epidemic can be better identified and characterised and linked to specific risk behaviours over the same time period. True incidence data, however, can only be obtained through large-scale cohort studies. Because such studies have disadvantages,<sup>11</sup> other methods have been used to estimate incidence, including indirect methods (e.g., using prevalence data from young people aged 15-24 years, assuming that HIV prevalence differences between the age strata represent incident HIV infections) and laboratory-based methods that can distinguish recent from earlier infections.

Another method of estimating incidence is through the use of mathematical models. Several mathematical models have been developed to estimate HIV incidence from prevalence data.

<sup>4</sup> AIDS epidemic update. December 2007, UNAIDS/WHO.

<sup>5</sup> Garcia-Calleja et al. 2006

<sup>6</sup> Most biological measures to assess the status of the HIV epidemic revolve around collecting data (total infections in a given population at a specific period of time).

<sup>7</sup> Hallett et al. 2006

<sup>8</sup> King R 1999

<sup>9</sup> Zaba B & Gregson S. 1998

<sup>10</sup> Ghys et al. 2006.

<sup>11</sup> Such studies have many drawbacks, including cost, ethical considerations, participation and/or selection bias and the fact that those included in a cohort will inevitably have more exposure to HIV interventions.

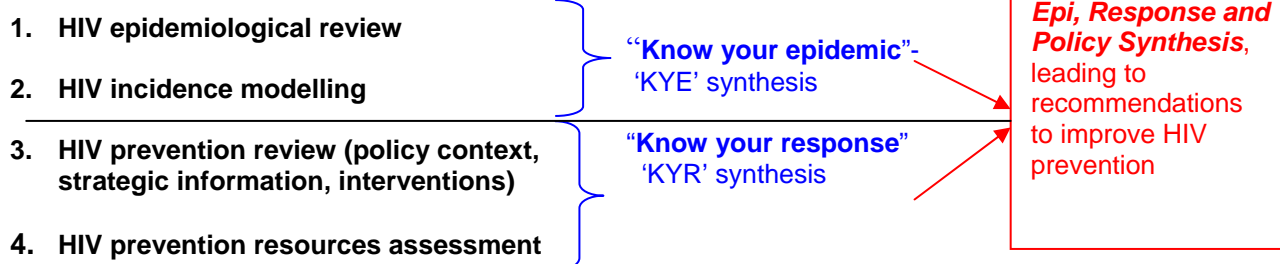


While some models (such as Spectrum) have been used widely, others are in their infancy<sup>12</sup> and their performance has not been assessed under rapidly-evolving epidemiological changes such as changes in risk and increasing access to ART.<sup>13</sup>

The MoT study is designed to assist countries in focusing prevention better to those who need the services, and by doing so, increasing universal access to prevention.<sup>14</sup> Unless the key populations at risk and their vulnerability factors are known, and the current prevention response understood, it is difficult to plan, target and deliver interventions that focus on those populations who most need such services, and in that way provide universal access to appropriate HIV prevention services to all populations who need them.

## 1.2. The Analysis of HIV Prevention and Modes of HIV Transmission Study (MoHT) in Kenya

The **Kenya Analysis of HIV Prevention and Modes of HIV Transmission (MoHT) Study** was conceived in 2007 by the UNAIDS Regional Support Team, working in partnership with The World Bank GAMET team, and UNFPA, to support better HIV prevention efforts in Eastern and Southern Africa. The Kenyan National AIDS Control Council (NACC), joined at the design stage to implement the study in the country when it became one of the five pilot countries to conduct a MoT Study. The study comprises four components:



The first cases of AIDS in Kenya were diagnosed in 1984, initially in sex workers (SWs) and then in the general population.<sup>15</sup> In 2005, the second Kenya National AIDS Strategic Plan 2005-2010 was adopted, which defined groups in the country that were deemed to be at risk, as well as listing a number of prevention activities that would be promoted.

The overall objective of this study is: “to contribute to the ongoing efforts to understand the epidemic and response in Kenya and thus help the country improve the scope (doing the right kind of activities), relevance (with the right populations) and comprehensiveness (reaching all members of target populations) with HIV prevention efforts”, with an ultimate goal of helping Kenya make more effective HIV/AIDS-related decisions.

Therefore, in the following pages the current status of the HIV and AIDS epidemic in Kenya is investigated, drawing on published surveillance and demographic data, and also utilising the UNAIDS incidence model. The report then assesses the relevance, comprehensiveness and cost of major HIV responses in relation to the epidemiological analysis and policy environment, and draws some conclusions about the state of the epidemic and about whether the prevention responses (and the resources allocated to them) are congruent with the evidence on where resources should best be directed.

<sup>12</sup> Wilson and Halperin, 2008

<sup>13</sup> Hallett et al. 2008.

<sup>14</sup> UNAIDS; Practical guidelines for intensifying HIV prevention: Towards universal access.; 2007

<sup>15</sup> In 1987 an HIV/AIDS programme was established in the Ministry of Health and AIDS case reporting began - National AIDS/STD Control Programme. AIDS in Kenya: 6<sup>th</sup> edition. Ministry of Health: 2002.

### 1.3. Kenya MOHT Study Team and Oversight

The study was conducted from December 2007 – July 2008 by a team of three consultants<sup>16</sup> and was coordinated and supervised by UNAIDS-Kenya and NACC.<sup>17</sup> The team received training in applying the UNAIDS incidence model in Johannesburg in Dec 2007 and at a Training Workshop in Nairobi in April 2008, carried out a review of data sources, consulted with experts at both the national and international levels, and worked with NACC officials, MoH, CDC, KEMRI, the national M&E Committee, UNAIDS, the University of Nairobi, Kenyatta and Moi Universities, as well as other research institutions in Nairobi, Mombasa and Kisumu.

A Technical Advisory Team (Kenya MoT Technical Team - KMoTTT) met regularly to review progress and provide additional suggestions and input. The study was monitored through regular meetings of the Coordination Team and the KMoTTT and through monthly progress reports. The synthesis report was drafted and submitted to the KMoTTT for an initial internal peer review and subsequently presented to the NACC coordination and leadership mechanisms for final vetting. Technical oversight was provided by the regional UNAIDS and GAMET teams, who reviewed and contributed to initial drafts of the report. The draft report was also presented to the Regional Team for peer and technical review before the report was finalised and submitted to the Regional Coordinators.

### 1.4. Methodology for the KYE synthesis

- Data Collection: A list of possible data sources was compiled using the internet, PUBMED, personal contacts, meetings and conferences, as well as a resource pack provided by UNAIDS (containing various key readings and background documents).
- A review of reports, publications and data focused on material/data published since 2000. When data were very scarce or not current, older publications and reports as well as information from other regional publications were used. All reports and publications were carefully reviewed and assessed for quality.
- The UNAIDS Incidence model was applied, using the available data.

No new data were collected for the KYE exercise. However, there were a few instances where data collected at NACC had not yet been analysed, and a preliminary analysis was carried out for this report. The main sources of epidemiological data on a national level were the Kenya Demographic and Health Survey (KDHS) 2003 and the Sentinel Surveillance data of 2005-2006. As well, the preliminary results of the 2007 Kenya AIDS Indicator Survey (KAIS) were released during the latter stages of this exercise, and those results are also included. The complete data from KAIS 2007 (due to be released in mid 2009) will inform future revisions of this report.

### 1.5. Methodology for the KYR synthesis

- Desk review: all relevant literature on HIV prevention activities in Kenya were compiled, reviewed and evaluated (including the latest Joint HIV and AIDS Programme Reviews - JAPR – 2006, 2007); policy issues in place that guide implementation of HIV prevention activities were reviewed;
- Key stakeholders were interviewed

<sup>16</sup> An epidemiologist/ team leader (L. Gelmon), a prevention specialist (P. Kenya), and a data collector/modelling specialist ( F. Oguya),

<sup>17</sup> UNAIDS M&E Advisor (G. Haile) and the Head of Policy Research and M&E of NACC (B. Cheluget)

- A special template developed by UNAIDS and GAMET to capture data from country programmes was customized for use in Kenya. A set of more than 8,000 organizations (out of a possible 14,000) were subjected to review and a smaller subset of these was analysed in more detail.
- Estimates of resources being spent on HIV were obtained from data collected in early 2008 to inform the UNGASS-2008 report.
- Further data on expenditure for the financial years 2005/2006 and 2006/2007 were collected from, among others, USAID (PEPFAR), DFID, JICA, World Bank and other UN Agencies, Clinton Foundation, Global Fund and the Government of Kenya.

### 1.6. Methodology for the KYE-KYR Synthesis

This step was largely based on the methodology described in “How to write an HIV epidemic, response and policy synthesis: a practical guide”, World Bank (version 3.0). The key areas of enquiry were:

- To understand the socio-cultural context in which HIV prevention policies have to be implemented
- To understand whether HIV prevention policies are based on the latest available evidence and global best practice
- To understand whether HIV prevention policies are responding to the key contributors of the epidemic
- To understand whether HIV prevention programmes are in line with the country’s HIV prevention policies. If the programmes are not in line with policy, to understand whether the policies are outdated (i.e. whether evidence exists that the new, innovative prevention responses are working) or whether the HIV prevention responses need to be adjusted (re-planned, re-designed or re-programmed) to reflect the latest policy-level decisions
- To understand whether the funding allocated for HIV prevention is directed where it is most needed

### 1.7. Hypothesis

After an initial review of the literature, and before the detailed modelling and prevention analyses were undertaken, the following hypotheses on the main factors associated with the HIV epidemic in Kenya emerged:

- Most transmission occurs through heterosexual sex as a result of discordance or through multiple partnerships:<sup>18</sup> these include both casual encounters and long-term relationships.
- Certain communities and groups are more likely to have multiple sexual partners,<sup>19</sup> many of these relationships are transactional, and involve not only sex workers, but other women who engage in sex for transactional purposes but who do not consider themselves to be sex workers.

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<sup>18</sup> It was recognised that while multiple *concurrent* partnerships (in contrast to multiple *serial* partnerships) are of greater importance for increased HIV transmission, the model does not actually deal with concurrency so the concurrency hypothesis could not be tested in the model. However, the model does multiple partnerships (which could be serial or concurrent)

<sup>19</sup> The definition of concurrency is not fixed – it can include one-night stands, contact with a sex worker, as well as having long term overlapping relationships. All of these are included under the category of “multiple partners”.

- Partners of people who engage in casual sex or who have multiple partners are at risk of contracting HIV from their steady partners.
- The epidemic is heterogeneous, with certain regions and communities displaying a higher prevalence that may be associated with a number of factors, including lack of male circumcision, low/selective rates of condom use, and lack of knowledge of self-status and sexual partner status.

In summary, the synthesis exercise attempts to answer the following questions:

- What is the magnitude of the epidemic?
- What are the trends and phase of the epidemic, its character and potential?
- What are the major contrasts/patterns in the epidemic?
- What transmission dynamics and behaviours give rise to most new infections?
- To what extent do the major responses, including national strategic priorities, investments and interventions, match the major causes of HIV transmission?
- Do major interventions reflect proven approaches and global best practice?
- In what respects and to what extent does the synthesis challenge established wisdom and thinking about the HIV response? How sure is the evidence base for such challenges? What are the major caveats?
- How can the conclusions be aligned with the realities of the current policy environment?

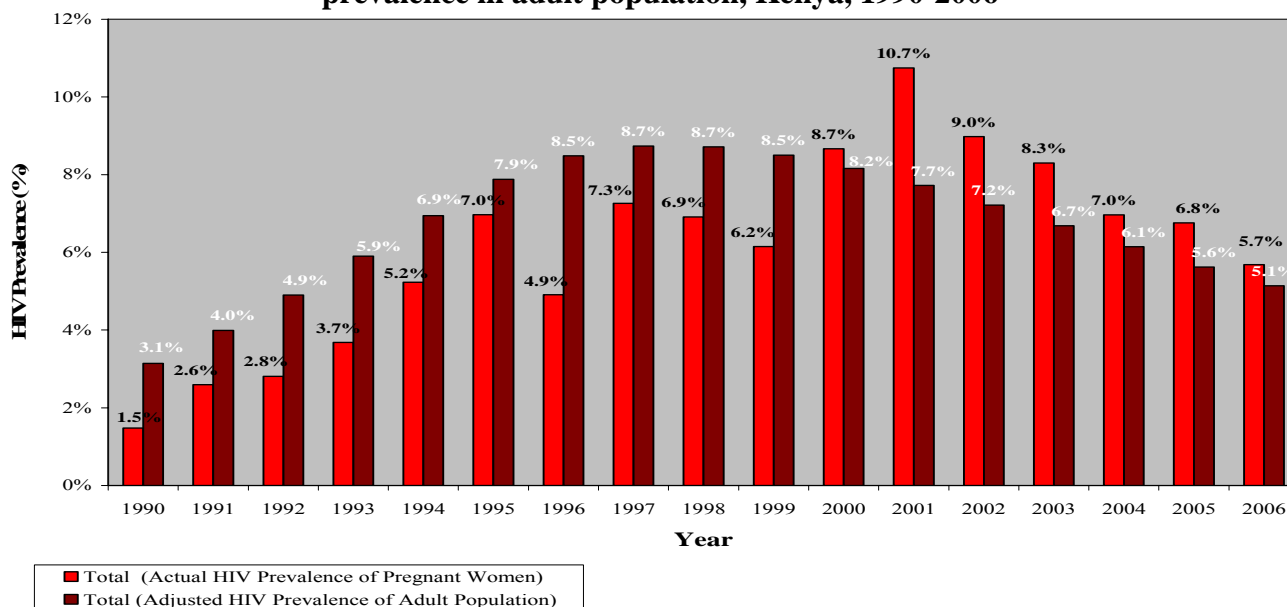
## CHAPTER 2. HIV AND AIDS IN KENYA – SUMMARY OF THE EPIDEMIC STATUS AND INCIDENCE ESTIMATES

This chapter describes the epidemiology of HIV in Kenya over time: trends in HIV prevalence and incidence, magnitude and current phase of the epidemic, the main transmission pathways for new infections; and the heterogeneity of the HIV epidemic (by sex, geography, age group and risk behaviours). It is a summary of the main findings of the “know your epidemic” synthesis of epidemiological data.

### 2.1. Trends in HIV prevalence

Significant declines in HIV prevalence have occurred over the past ten years. Sentinel surveillance data show that HIV prevalence among pregnant women in Kenya fell from a peak of 13.4% in 2000 to 5.7% in 2006 (CI 6.9% – 7.8%). As seen in Figure 1, the weighted average of HIV prevalence (estimated using sentinel surveillance data) dropped from 10.7% in 2001 to 5.7% by the end of 2006 – a 50% drop in HIV prevalence.<sup>20</sup>

**Figure 1: HIV prevalence among pregnant women and adjusted (estimated) HIV prevalence in adult population, Kenya, 1990-2006**



Source: NACC and NASCOP: National HIV Prevalence in Kenya June 2007

However, the 2007 Kenya AIDS Indicator Survey (KAIS) demonstrated a slight increase in prevalence, from 6.7% amongst 15-49 year olds (reported in the KDHS 2003) to 7.4%.<sup>21</sup>

There has been much debate over what these increased prevalence rates might mean, ranging from simply more accurate reporting, to the effect of more people surviving with HIV (thanks to ART) which would raise the prevalence, to a real reversal of the downward trend in prevalence, with more incident cases occurring in the country (due to various reasons). These hypotheses will be addressed individually in the coming pages and will continue to be discussed until after the publication of the complete KAIS Report.

With declines in HIV prevalence, there has been an increase in the mortality rate and reduced life expectancy over the past 15 years. Between 1998 and 2003, the mortality rate increased by 40% among women and 30% among men aged 15-49 (KDHS 1998 and KDHS 2003). This

<sup>20</sup> National AIDS Control Council, Office of the President, Kenya. 2008. UNGASS 2008 Country Report.

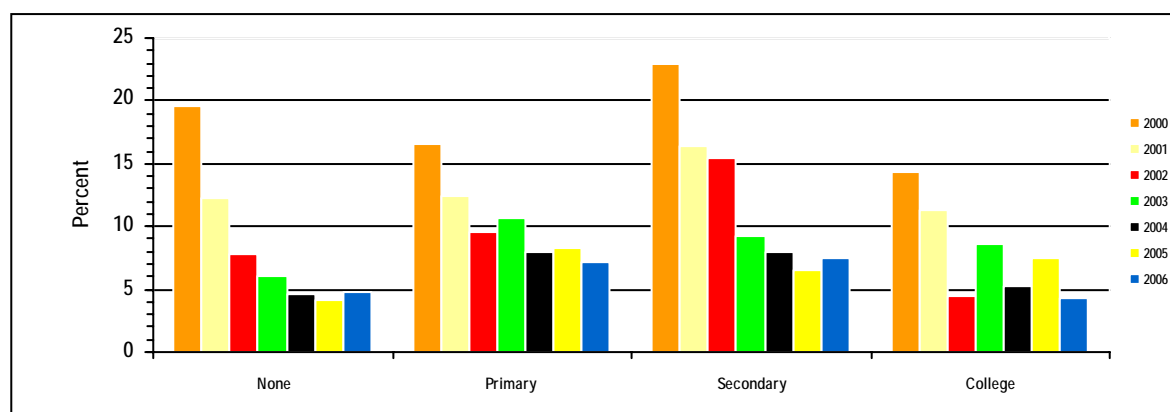
<sup>21</sup> National AIDS and STI Control Programme, Ministry of Health, KAIS 2007 – revised Preliminary Report; Oct. 2008

increase was largely ascribed to AIDS, deterioration of health services, and increasing poverty.<sup>22</sup> Life expectancy of Kenyans at birth has fallen from 62 years to 47. As well, increasing infant and child mortality rates were attributed either directly or indirectly to HIV and AIDS.<sup>23</sup>

**This trend of declining prevalence is noted across all educational levels**, as seen in Figure 2, and the disparity in prevalence across different educational levels continues. The KAIS 2007 reported that women with primary education have a prevalence of 10% compared to 7% for women with secondary education and 4% with tertiary. Men show a similar decrease in HIV prevalence with higher levels of education, but the differences are not statistically significant.<sup>24</sup>

According to the National STIs Control Programme (NASCO), the number of deaths attributed to AIDS peaked in 2003 at 120,000 and over the last three years has decreased to 85,000 deaths per year.<sup>25</sup> By 2007, 172,000 adults were on ART compared with 60,400 in 2005 (NASCO database), whereas ART provision to children increased from 4,000 in 2005 to 13,000 in 2007 - equivalent to 35% of the 430,000 adults and 56% of the 23,000 children requiring treatment (JAPR 2007). Therefore, even without any increase in incidence, the likelihood is that the overall prevalence will stabilise or increase in the coming years as more people begin treatment and more deaths due to AIDS are averted.<sup>26</sup>

**Figure 2: HIV prevalence among ANC attendants by educational status 2000- 2006**



Source: KAIS, 2007

## 2.2. Heterogeneity of HIV prevalence

The evidence about national and general declines in HIV prevalence masks the heterogeneity of the HIV epidemic in Kenya: sex-related, geographic, some sub-population and age-related heterogeneity are described below.

### 2.2.1 Sex-related heterogeneity

The Kenya AIDS Indicator Survey (KAIS) 2007 estimated that 1.4 million people in Kenya were living with HIV (up from the 1.3 million in the KDHS 2003 when an estimated 740,000 were women 15 years or older, 410,000 were men, and 150,000 were children aged 0-14.) The KAIS 2007 further estimated that national prevalence of 7.4% in people of 15-49 years (up from 6.7% in KDHS 2003) reflected a prevalence of 5.5% in men (up from 4.6% in KDHS

<sup>22</sup> Government of Kenya, Demographic and Health Survey (KDHS) 2003

<sup>23</sup> Central Bureau of Statistics, Analytical Report on Population Projections, 2002

<sup>24</sup> KAIS, 2007,

<sup>25</sup> National AIDS Control Council and the National AIDS and STD Control Programme June 2007

<sup>26</sup> So dependence on prevalence measures as indicators of the current status of the epidemic is even more problematic

2003), and 8.8% in women (a slight variation from 8.7% in KDHS 2003), a female to male ratio of 1.6 to 1 (the KDHS 2003 female to male ratio was 1.9:1).

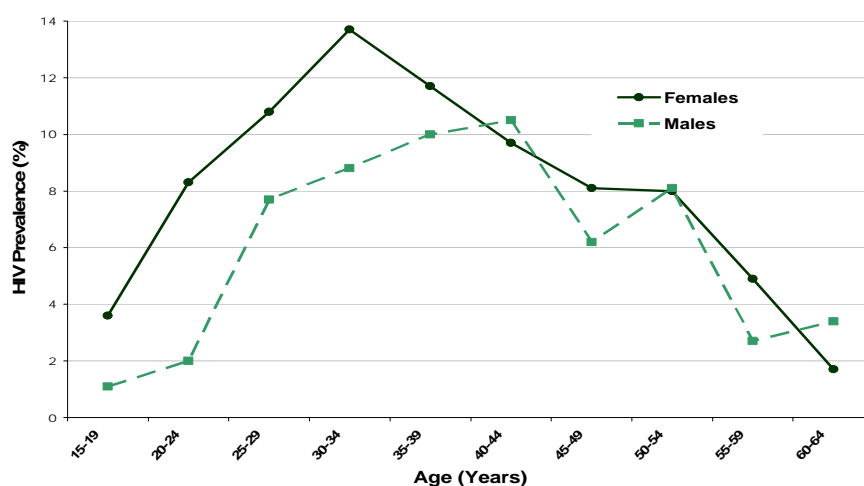
Sex differences in HIV prevalence are most striking in the 15–24-year age group. Among young women, the 2007 KAIS reported prevalence is 6.1% and 1.5% for young men (as notable is the increase in both young men and women from the 2003 figures of 4.4% and 0.8% respectively). This might confirm the belief that most new infections occur among women between the ages of 15 and 24, however it will be seen that incidence may be even higher in other groups.<sup>27</sup> As well, far more women than men in both urban and rural areas are infected with HIV.

**A high number of couples in Kenya are discordant (one partner is HIV-positive, and probably does not know his/her status):** Overall, an estimated 6% of all couples are discordant; and both partners are HIV-positive in almost 4% of couples – in total, nearly 10% of all married or cohabitating couples in Kenya have at least one HIV-infected partner. The KAIS 2007 indicated that almost half of all married or cohabitating men and women with HIV infection in Kenya were in an HIV-discordant relationship. In the 350,000 Kenyan couples estimated to be HIV-discordant, 160,000 HIV-uninfected men are married or cohabitating with an HIV-infected woman, and 190,000 HIV-uninfected women are married or cohabitating with an HIV-infected man.

## 2.2.2 Age-related heterogeneity

HIV prevalence in Kenya peaks in women and men at different ages as seen in Figure 3: at 30–34 years for women (13.3%) and 40–44 years in men (10.2%) - these are increases by one age range for each group from 2003, an indicator perhaps of the “aging of the epidemic”. A higher proportion of Kenyans aged 30–34 are currently infected with HIV than in any other age group. The burden of infections is higher among females than males until age 39, after which the ratio of male to female infections begins to vary by age but is around 1:1.<sup>28</sup>

**Figure 3: HIV Prevalence by age and sex in Kenya (2007)**



Source: KAIS 2007

Young women in the 15–24 age group are more than five times more likely to become infected with HIV than young men.<sup>29</sup> This could be due to a number of factors: young women’s biological vulnerability to infection, a later age of sexual debut for men than women, and also

<sup>27</sup> Kenya HIV/AIDS Data Booklet 2005, NACC.

<sup>28</sup> KAIS 2007, op cit

<sup>29</sup> 2007 KAIS revised Preliminary Report



because the people with whom the young women are having sex are more likely to be HIV positive -- transmission taking place between younger women and older men has been documented, and cross-generational sex may be an important aspect of the transactional sexual patterns discussed further in Section 6.1.

An interesting feature of the KAIS 2007 was the inclusion of prevalence figures for older age groups not included in earlier surveillance. As can be seen from Table 1, including data from people aged 49-64 reduces the overall prevalence figures slightly, but reinforces the facts that not only does the risk of transmission continue into late middle age for both men and women, but also that thousands of middle-aged and elderly people in Kenya are living with HIV.

**Table 1: HIV Prevalence including older age groups (2007)**

Age	HIV Prevalence in Kenya		
	Total	Females	Males
Total (15-64)	7.1	8.4	5.4
Total (15-49)	7.4	8.8	5.5

Source: KAIS 2007

### 2.2.3 Geographic heterogeneity

HIV prevalence varies significantly between provinces in Kenya. Provincial prevalence rates range from 0.81% in North Eastern to 8.8% in Nairobi and 14.9% in Nyanza, double the national average. It should be noted that the declining prevalence seen elsewhere in the country over the past few years was NOT seen in Rift Valley, Coast or Eastern Province, which may imply a continued higher incidence in these provinces (or better surveillance).

Further analysis of the 2006 sentinel surveillance data shows that even within provinces there is marked variation. Nyanza is the province most affected by HIV/AIDS, with an estimated 30% of the national burden. Suba is the highest prevalence site (26.3% prevalence) with Kisumu in second place with a prevalence of 18.5%. Of concern is that Kisumu has shown a rising prevalence over the past three surveys, which could again mean that there is a continued higher incidence in Nyanza in contrast to most of the rest of the country. Of concern also is the Rift Valley, where the KAIS 2007 indicates a 40% increase in prevalence since 2003.

The KAIS report notes that the prevalence data do not indicate the burden of disease because of population differences, so although the proportion of infected adults in the Coast and Nairobi is greater than in Rift Valley, there are approximately 322,000 infected adults in Rift Valley as compared to 310,000 for Nairobi and the Coast combined. The KAIS Report estimates that together, Nyanza and Rift Valley account for about 50% of HIV-infected adults in the country.

The sentinel surveillance report of 2006 and the KAIS 2007 note a rural/urban differential, regardless of marital status, although the differences are becoming less marked, especially for men. Prevalence in urban women is 10.0 percent and 7.8 percent for rural women. But for men, the additional transmission risk associated with urban residence, which used to be double that of rural, is now barely significant (6.1% urban as compared to 5.2% rural). The significant increase in prevalence in rural males represents a 58% increase in prevalent infections. Furthermore, as most of Kenya's population is rural (75%), this population bears the weight of HIV infection – many more infected adults (1 million) lived in rural areas than in urban centres (400,000).

### 2.2.4 Sub-population Heterogeneity

Some populations have higher HIV prevalence than the general population, as seen in Table 2:



**Table 2: Summary of HIV prevalence data for key most-at-risk populations in Kenya**

Sub-Population	HIV prevalence				Geographic locations of sub populations
Truck drivers	LOCATION	SAMPLE GROUP	YEAR	HIV PREVALENCE	Along truck stops and major transport routes. Morris and Ferguson recently completed a survey of truck stops, truck drivers and sex worker "hot spots" along the highway from Mombasa all the way to Kampala, Uganda. <sup>35</sup>
	Athi River	Truck drivers	1994	27% <sup>30</sup>	
	Mariakani	Truck drivers and assistants	1995	26% <sup>31</sup>	
		Trucking company employees	1999	18% <sup>32</sup>	
	Mombasa-Nairobi highway	Truck drivers	1992	27% <sup>33</sup>	
	Mombasa	Trucking company workers	1997	18% <sup>34</sup>	
Sex workers	1980s	65% HIV prevalence			Along transport routes, in Nairobi, close to coastal towns, and along lakeside with fishing communities
	2003	12% STI prevalence			
	2005	31% HIV prevalence <sup>36</sup>			
	2006	50 – 80% HIV prevalence			
Fishing communities		25–30%	HIV prevalence in sub population		Lakeside districts, Nyanza province
	2004/5	40%	HIV prevalence among individuals in their thirties <sup>37</sup>		
	2005	74.3%	HSV-2 prevalence (Bukusi et al 2006)		
	2005	9.6%	Syphilis prevalence (Bukusi et al 2006).		
Male Prisoners	Higher prevalence than in general population 10% prevalence <sup>38</sup> , but more studies are underway <sup>39</sup>				Mostly Nairobi
MSM	10.6% HIV prevalence of all MSM tested between 2002 and 2005 (n = 780) <sup>40</sup> (VCT data is inherently biased) 24.6% HIV prevalence in Mombasa (n = 285) <sup>41</sup> 38% HIV prevalence in Mombasa amongst male sex workers (n = 37) <sup>42</sup> 43% for MSM exclusively <sup>43</sup>				Nairobi, Mombasa (assumed, studies mainly carried out here)
Military	Statistics on HIV prevalence in the military and other uniformed services are <b>difficult to access</b> , and very few published studies on HIV prevalence are available. Possible reasons for this include: some militaries cannot afford to or do not want to test serving soldiers, many soldiers do not want to be tested, and national security issues may be involved, with a reluctance to release data perceived as confidential or sensitive. <sup>44</sup> However, there is strong anecdotal evidence that at the very early stage of the east African epidemic, some militaries were hard-hit by the loss of officers to AIDS. The only available benchmark is a prevalence of 20% found in the Uganda Defence Force. <sup>45</sup>				Nairobi
Injecting Drug users	35% amongst heroin users in 2004 (Odek-Ogunde M et al. 2004)				Nairobi, Mombasa, Malindi, and Lamu (Coast province)
Refugees (Approx 270 000 in Kenya (June 2007) <sup>46</sup> .)	HIV prevalence varies significantly, for example: Spiegel et al <sup>47</sup> in their review of refugee camps in the Great Lakes region found an HIV prevalence in Dadaab Camp in Kenya of 0.6% in 2003 and 1.4% in 2005. This is considerably less than the 6.1% national prevalence recorded in those years. But Dadaab is in North Eastern Province, and these prevalence figures are just about the same as the surveillance data recorded in North Eastern in those years (0.4% in 2004 and 1.3% in 2005). <sup>48</sup>				All areas with refugee sites

<sup>30</sup> Bwayo J et al. 1994<sup>31</sup> Mbugua GG et al. 1995<sup>32</sup> Rakwar J et al. 1999,<sup>33</sup> Bwayo J et al. 1992<sup>34</sup> Jackson DJ et al 1997.<sup>35</sup> Morris CN & Ferguson AG; 2006.<sup>36</sup> Hawken M et al. 2002.<sup>37</sup> Kissling E. et al 2005, and Bukusi EA et al. 2006<sup>38</sup> IRIN 2007<sup>39</sup> Kenya Daily Nation, 24 May 2008, p. 3<sup>40</sup> Angala P et al. 2006<sup>41</sup> EJ, Graham SM, Okuku HS, et al. 2007<sup>42</sup> Geibel, S, van der Elst EM, King'ola N, et al. 2007 .<sup>43</sup> Sanders EJ, Graham SM, Okuku HS, et al. 2007<sup>44</sup> Whiteside A et al., 2006.<sup>45</sup> De Waal A 2005<sup>46</sup> OCHA Regional Office for Central and East Africa 2007<sup>47</sup> Spiegel et al; 2007<sup>48</sup> A recent systematic review of whether there is any evidence that conflict increases HIV transmission compared HIV in refugees and surrounding host populations. It found that "there is insufficient evidence that HIV transmission increases in populations affected by conflict, and insufficient data to conclude that refugees fleeing conflict have a higher prevalence of HIV infection than do their surrounding host communities. In many circumstances, comparisons of HIV prevalence in both situations show the opposite result".

These sub-populations are at higher risk of HIV infection due to their risk behaviours and higher prevalence levels in their communities. Sexual networking between some of these sub-populations and with the general population increases their risk, and maintains HIV at high levels in the general population.

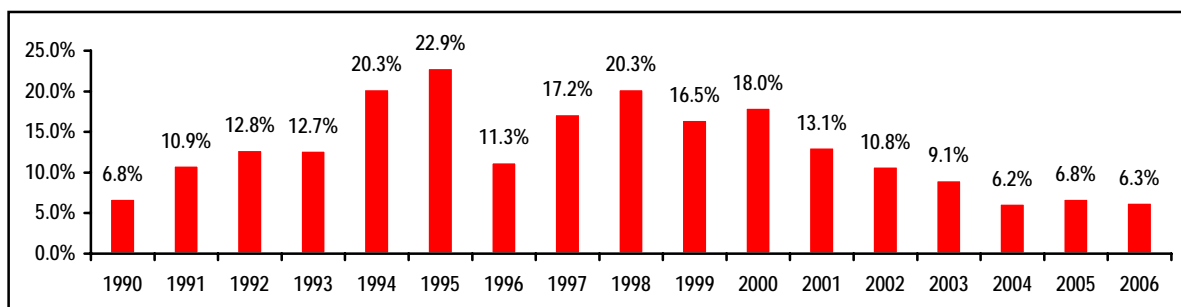
## 2.3. Trends in HIV incidence

### 2.3.1 HIV incidence in the general population

Despite declines in HIV prevalence, it appears to have stabilised at high levels, and incidence data in Kenya<sup>49</sup> show that:

- New HIV infections continue to occur every year: estimates range from 55 000 (official government estimate based on the KDHS 2003); to 82,370 (Gouws et al., incidence modelling done in 2006) and 110,000 (other estimates).<sup>50</sup> The Gouws data translated into an estimated annual incidence of around 0.5%.
- Using HIV prevalence among young women as a proxy measure for infection incident, suggests that the number of new HIV infections has decreased in the last 10 years (see Figure 4 that shows the HIV prevalence amongst ANC attendants aged 15 to 24)

**Figure 4: HIV prevalence among ANC attendants age 15-24 in Kenya, 1990-2006**



Source: National AIDS and STD Control Programme (NAS COP), Ministry of Health (2006). Sentinel Surveillance of HIV and STDs in Kenya.

- New HIV infections peaked in the 1990s: a model created with SPECTRUM<sup>51</sup> software estimates that new adult infections peaked at 200,000 in 1993. Annual adult AIDS deaths peaked at 120,000 in 2003, reflecting the rise in infections during the mid-1990s. AIDS deaths would have remained at that level had it not been for expanding delivery of antiretroviral drugs.

### 2.3.2 Incidence in sub-populations at higher risk of HIV infection

Longitudinal studies amongst sub-populations that have displayed higher risk behaviour demonstrate higher incidence rates than in the general population. For example, the Kisumu circumcision trial (carried out from 2003-2006 among men in Kisumu, the capital of Nyanza province) showed a 2-year HIV incidence of 4.2% in the control group.<sup>52</sup> This was similar to the incidence seen in a cohort of Nairobi sex workers followed from 1998-2002 in a trial of antibiotic chemoprophylaxis to reduce HIV's and STIs: the HIV incidence was 4% in the

<sup>49</sup> Based on proxy measures (using prevalence data in the 15 to 19 year old age group), mathematical modelling, or longitudinal cohort studies.

<sup>50</sup> National AIDS Control Council, Office of the President, Kenya. 2008

<sup>51</sup> National AIDS Control Council, Office of the President, Kenya. 2008. *ibid*.

<sup>52</sup> Bailey RC et al. 2007.

treatment group and 3.2% in the placebo group.<sup>53</sup> Annual incidence of 3.1% was observed in a longitudinal study of trucking company workers carried out in the late 1990s.<sup>54 55</sup>

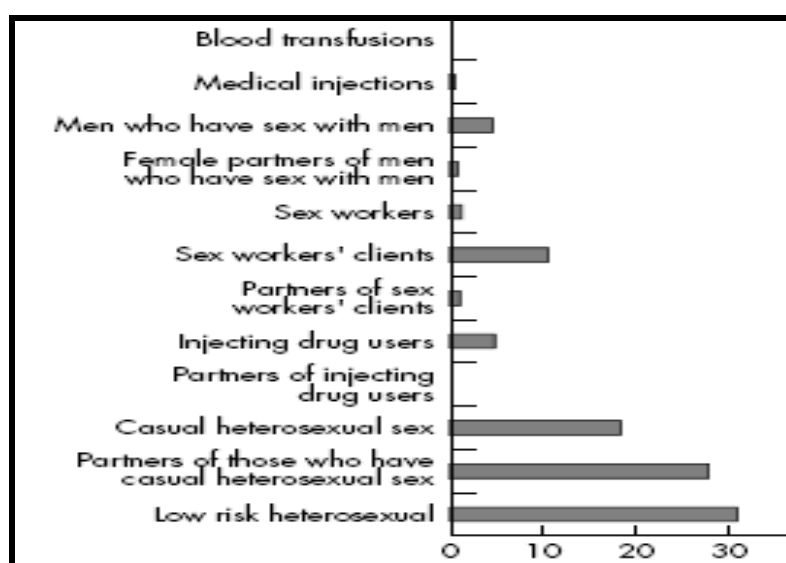
Incidence in some of the most-at-risk populations has declined over the past twenty years, preceding declines in incidence in the general population by five years. A sex worker cohort tracked since the 1980s had an annual incidence greater than 7% in the late 1980s, and a peak prevalence of 81% in 1986.<sup>56</sup> In the past eight years this prevalence has fallen to below 50%.

#### 2.4. Sources of New HIV Infections – Modelling the Epidemic

An incidence model was developed in collaboration with the UNAIDS Reference Group on Estimates, Modelling and Projections. It calculates the expected short term incidence of HIV infections among the adult population by mode of transmission, using as input data the current prevalence of HIV infection, the number of individuals in particular risk groups, and the risk of exposure to infection within each group.

Using the UNAIDS model, Gouws et al<sup>57</sup> carried out a preliminary study for Kenya, based on data available in 2005, and their results are seen in Figure 5. They reported that in 2005, an estimated 82,369 new infections occurred, of which 75% could be ascribed to heterosexual sex (30.1% “low risk heterosexual” population”, 27.7% in “partners of those who had casual heterosexual sex” and 18.3% in people having “casual heterosexual sex”), with the remainder attributable to “sex workers”, “injecting drug users”, “men having sex with men”, “medical injections” and “blood transfusions”.

**Figure 5: Distribution of incident cases (%) by mode of exposure for Kenya**



Source: Gouws et al 2005

One category that has caused confusion is “**low risk heterosexual**”, which implies that this group does not fit into any of the “high risk” categories, but the label is a bit of a misnomer,

<sup>53</sup> Kaul R et al, 2004

<sup>54</sup> Rakwar J et al; 1999

<sup>55</sup> It should also be recognised that these incidence figures are from populations that were being followed for research purposes, and ethical requirements meant that they were also being intensively counselled on HIV prevention and provided with condoms. It can be assumed that the actual incidence in similar unobserved populations would have been even higher.

<sup>56</sup> Simonsen N et al; 1990

<sup>57</sup> Gouws E et al. 2006.

because this group has sex with a steady partner who in the past may not have been monogamous, not used condoms, and engaged in other “risky” behaviours. Therefore, in this study, and in subsequent tables, this group has been re-labelled “**steady partner heterosexual**”.

As one of the outcomes of this exercise was to update and refine the modelling done by Gouws et al, using the most recent data available, two decisions were taken:

- In an attempt to further disaggregate the large group that is at risk because of their heterosexual activities, the model was modified to introduce additional categories for clients of sex workers. Based on knowledge of the epidemic and prior identification of specific higher-risk groups in the country, the KMoTTT recommended that “Long Distance Truck Drivers and their Partners”, “Migrant Farm Workers and their Partners” and “Other Clients and their Partners” be added to the model. In addition, two new groups were added, namely ‘Fishing Communities<sup>58</sup>’ and ‘Prison Populations’. However, certain most-at-risk populations were not included in the model, including fishing communities, refugees, women who have been subjected to sexual violence, etc. partly because of a lack of specific quantitative data which was required for the model.
- Because of the heterogeneity of the epidemic in Kenya, it was decided to do four models: the National Model (as above), plus three additional models – one for each of the three provinces in Kenya exhibiting the highest levels of HIV prevalence: Nyanza, Nairobi and Coast provinces.
- Due to lack of more current data and because the latest available demographic data were only from KDHS 2003, it was agreed that the MOT model only be carried out for 2006. It is expected that the model will be updated once the 2008 KDHS report is released in 2009, even though it is anticipated that the pattern of new infections will remain relatively similar.

The following pages summarise the results of this modelling.

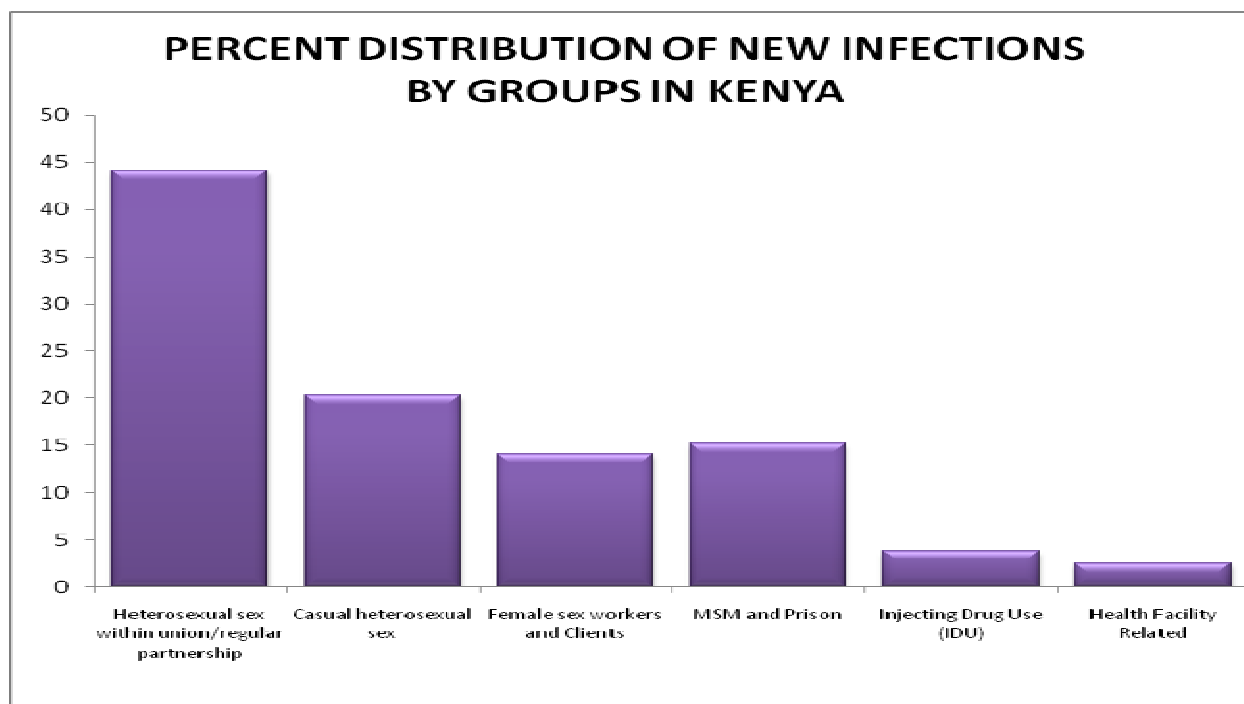
#### 2.4.1 National Model Outputs

The summarised results are shown in Table 3 and Figure 6 below. The model indicates that a total of about 1.2 million adults in Kenya were living with HIV by 2006. The majority of the prevalent infections were among the group who engage in casual heterosexual sex and their partners (about 580,000 persons), steady partner heterosexual (low risk) of about 170,000 people, sex workers and their clients (about 108,000 people) and MSM and the prison population (about 34,000 persons).

**Table 3: Percent of New infections of HIV by groups**

Groups	Percent of New infections			
	National	Nyanza	Nairobi	Coast
Heterosexual sex within union/ regular partnership	44.1%	38.5%	37.4%	37.9%
Casual heterosexual sex	20.3%	30.5%	23.0%	14.9%
Sex workers and Clients	14.1%	23.1%	14.7%	18.2%
MSM and Prison	15.2%	6.0%	16.4%	20.5%
Injecting Drug Use (IDU)	3.8%		5.8%	6.1%
Health Facility Related	2.5%	1.9%	2.7%	2.3%
<b>Number of New Infections</b>	<b>76,315</b>	<b>25,195</b>	<b>10,155</b>	<b>6,656</b>

<sup>58</sup> For reasons discussed elsewhere, the fishing community data are not included separately in the following pages, but are discussed in the Box on page 33.

**Figure 6: Distribution of New Infections in Kenya**

The model estimates a total of 76,315 new infections to have occurred in 2006 among the adult population aged 15–49 years (as compared to 82,370 in the Gouws et al model, a difference that could be significant, or simply the result of more precise modelling).

Nationally most new infections occurred in couples who engaged in heterosexual sex within a union/regular partnership, those who practice casual sex, are sex workers or are clients of sex workers, are among the prison population and MSM. Those who are in a union or regular partnership contributed 44% of new infections. Men and women who engage in casual sex contributed 20% of new infections, sex workers and their clients contributed 14% and MSM and Prison populations contributed 15% of new infections. This pattern is similar in the provinces except for Nyanza where the contribution to new infections by those who practice casual sex, and sex workers and their clients was much higher than in the other provinces. Generally the three main sources of new infections nationally and in the three provinces are heterosexual sex in a union/regular partnership, casual sex, and sex workers and their clients. These three categories contribute over 70% of new infections except in Nyanza where they contribute over 90% of new infections. Injecting drug use and health facilities contributed 6.3% of new cases.

The number of new cases was highest in Nyanza (25,195) followed by Nairobi (10,155) and Coast Province (6,656 cases), clearly indicating that Nyanza and Nairobi continue to bear the heaviest burden of the epidemic in Kenya.

The model estimates that the groups exhibiting the highest rates of transmission of infection are IDU (26%), Prison population (13%), Partners of IDU (8%) and MSM (7%) (Refer to annex 1).

Although the number of cases in IDU is low, modelling results indicate that the incidence rate of the epidemic was highest among IDU at 256 per 1,000 followed by MSM in Prison (126/1,000), partners of IDU (78/1,000), and MSM (67/1000). This indicates that these populations are at high risk, the virus spreading among them at a very high rate compared to the other risk groups. Besides being due to very efficient transmission through sharing needles and anal sex, the high incidence rate among these groups may be an indicator of their marginalization and the lack of interventions directed towards them.

## 2.4.2 Nairobi Province outputs

Nairobi is the capital city of Kenya and has a mix of ethnic groups with different cultural practices. Its inhabitants are from different socio-economic groups ranging from the very well-to-do to the very poor living in some of the biggest slums in Africa.

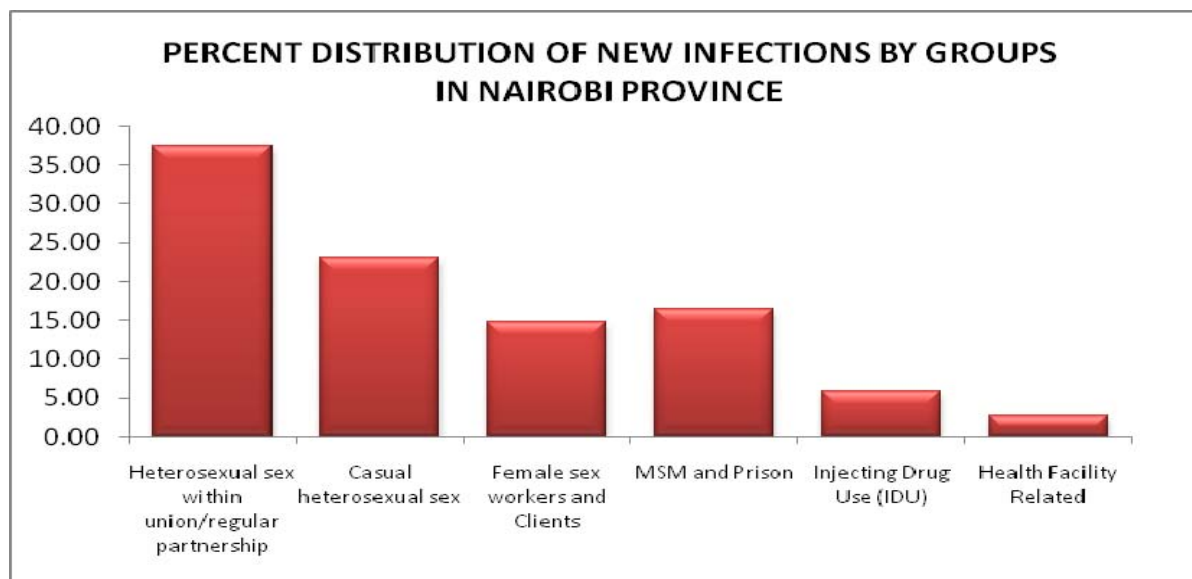
Of a total adult population of 1.9 million, Nairobi province has 154,000 infected persons, most of who are distributed among those who practice casual sex and their partners (110,000 persons), sex workers, clients and their partners (17,000), low risk heterosexual sex (15,000 persons), MSM (4,000) persons), female sex workers (5,648 persons) and long distance truck drivers (4,550 persons).

In 2006, the model estimates 10,155 new cases of HIV in Nairobi. Table 4 and Figure 7 show that the majority of these cases (37%) resulted from heterosexual sex within unions or with regular partners, followed by adults who engage in casual sex (23%). MSM combined with the prison population contributed slightly more new infections than sex workers and their clients with 16% and 14.7% respectively.

**Table 4: Percent of New infections of HIV by groups – Nairobi**

Groups	National	Nairobi
Heterosexual sex within union/ regular partnership	44.1%	37.4%
Casual heterosexual sex	20.3%	23.0%
Sex workers and Clients	14.1%	14.7%
MSM and Prison	15.2%	16.4%
Injecting Drug Use (IDU)	3.8%	5.8%
Health Facility Related	2.5%	2.7%
<b>Number of New Infections</b>	<b>76,315</b>	<b>10,155</b>

**Figure 7: Distribution of New Infections in Nairobi**



As indicated for the National Model, injecting drug users and their partners both exhibit high incidence rates of 3% and 7%. Prison population and MSM follow with incidence rates of 1% and 6%. Injecting drug users and their partners, though few in number and the prison population, MSM and female sex workers exhibit high incidence rates ranging from 3% to 5%. This indicates that these groups comprise the most at risk groups in Nairobi.

### 2.4.3 Coast Province Outputs

The people in the Coastal region, apart from being predominantly Arab-Swahili, are also multi-ethnic due to urban migration from other parts of the country. The Coastal region has a vibrant tourism industry and a sizeable resident European community. Being the site of the main port city for the country and the region at large, it has historically been a centre for trade and import and export activities. The Coast region is highly frequented by local, regional and international visitors coming for recreation and tourism, trade, business and work. These visitors create a demand for certain risk behaviours such as drug use, MSM and sex work including child prostitution which are comparatively more prevalent in the coastal region.

The model shows that the Coastal Region (with an adult population of 1,549,057) has a total of 89,000 HIV positive persons: those who engage in the casual sex and partners (47,000 persons), steady partner heterosexuals (15,000 persons), sex workers, clients and their partners (11,000 persons) and prison population and MSM (5,500 persons).

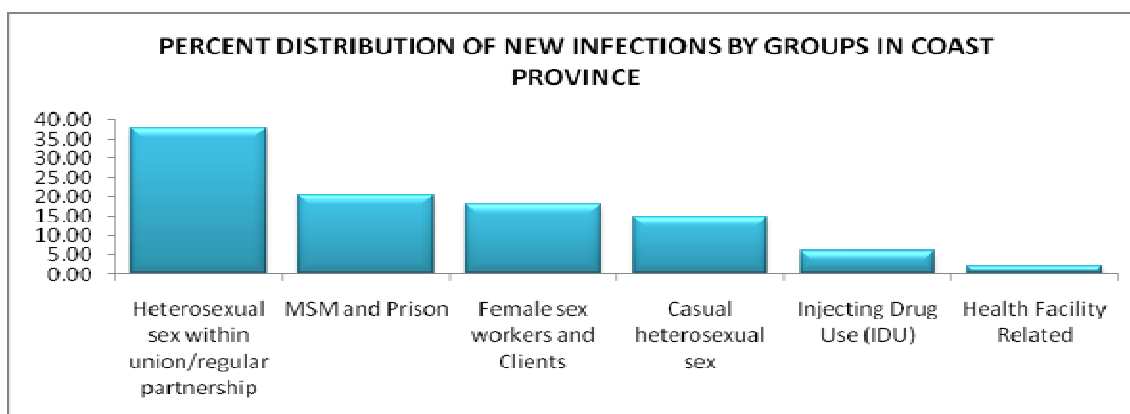
In 2006 Coast Province had 6,656 new cases of HIV. Table 5 and Figure 8 show that most new infections occurred among those who engaged in heterosexual sex within unions or with regular partners (38%), followed by MSM and prison populations (20%), sex workers and their clients (18%) and casual sex (15%). Injecting drug users contributed 6% of the total number of new infections in the coastal region.

As indicated in the national and Nairobi Province models, injecting drug users exhibit the highest incidence rate of 2%; their partners' incidence rate is also relatively high at 7.5%. The prison population and MSM (13% and 6.5%) also exhibit relatively high incidence.

**Table 5: Percent of New infections of HIV by groups - Coast**

Groups	National	Coast
Heterosexual sex within union/ regular partnership	44.1%	37.9%
Casual heterosexual sex	20.3%	14.9%
Sex workers and Clients	14.1%	18.2%
MSM and Prison	15.2%	20.5%
Injecting Drug Use (IDU)	3.8%	6.1%
Health Facility Related	2.5%	2.3%
<b>Number of New Infections</b>	<b>76,315</b>	<b>6,656</b>

**Figure 8: Distribution of New Infections in Coast Province**





#### 2.4.4 Nyanza Province outputs

Nyanza region is located around the shores of Lake Victoria, the largest fresh water lake in Africa and second in the world. The region is predominately inhabited by the Luo community and other ethnic groups such as the Kisii and Kuria. Traditionally the Luo community do not practice male circumcision, unlike most other ethnic groups in Kenya. Fishing is the dominant economic activity in this region and has created a large industry comprising boat builders and repairers, fishing nets and gear manufacturers, boat engine mechanics, fish purchasers, sellers and processors, truck drivers who transport the fish and businessmen. Boat owners earn a relatively high income on a regular basis, and tend to have a lot of free time between fishing activities.

Sex workers are attracted to fishing beaches because of the relatively high incomes of the fishing crews. There is a group of women involved in sales and processing of the fish who are dependent on the fishing crew to receive fish, as their main source of income. Bar owners and beer sellers – mostly women -- spend most of their time at their premises which, in many cases, double as living quarters as well, and a considerable number of them consume alcohol and get sexually involved with their male customers.

Landing beaches are located in Bondo, Kisumu, Nyando, Rachuonyo, Homa Bay, Suba and Migori. According to the Frame Survey 2006, Suba had the highest number of fishers at 15,558 in 108 landing beaches followed by Bondo 12,625 in 76 landing beaches.

According to the K-MoHT model, a large proportion of HIV infected people (total of 302,000 adults) live in Nyanza. Nyanza province bears the brunt of the epidemic with three times the number of infected persons compared to the other two high prevalence provinces. The highest prevalence is noted among those who contribute to transmission through casual heterosexual sex (CHS) (132,000 persons), in the steady partner heterosexual (low risk heterosexual) (73,000 persons), among partners of CHS (56,000) and among sex workers (22,000 women).

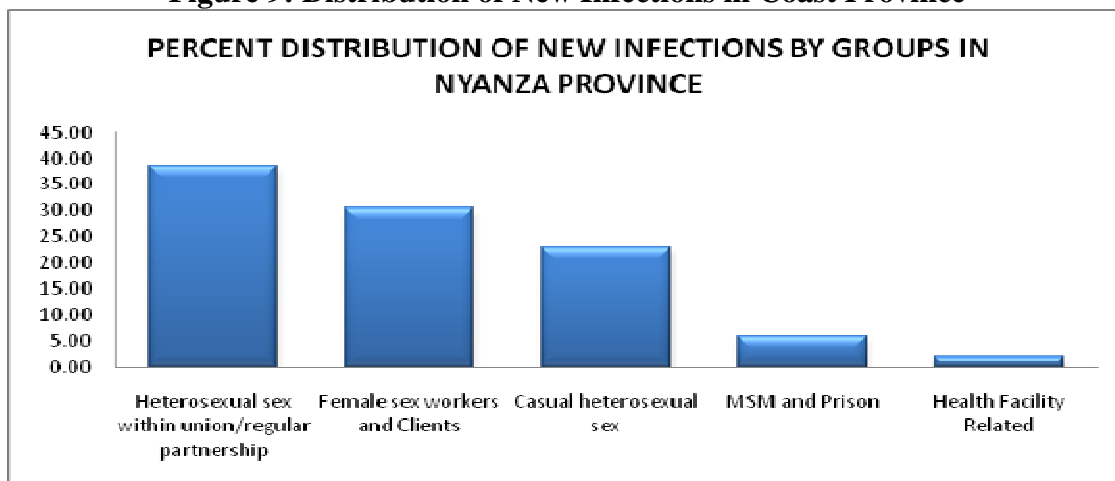
As seen in Table 6 and Figure 9, most new infections in Nyanza were among those who engage in heterosexual sex within unions or with regular partners (39%), those who engage in casual sex (31%) and sex workers and their clients (23%).

Clearly the patterns and dynamics of the epidemic in Nyanza are very different from the other provinces. According to the model results, in 2006 Nyanza produced the highest total number of new infections (25,200 persons), while Nairobi and Coast Provinces had 10,155 and 6,656, respectively. Almost 70% of the new infections in Nyanza arose in the casual heterosexual sex group (30.5), their partners and the steady partner heterosexuals (38.5%). Sex workers and their clients contributed 23.1% with only 6% of the total attributed to MSM and men in prisons

**Table 6: Percent of New infections of HIV by groups – Nyanza**

Groups	National	Nyanza
Heterosexual sex within union/ regular partnership	44.1%	38.5%
Casual heterosexual sex	20.3%	30.5%
Sex workers and Clients	14.1%	23.1%
MSM and Prison	15.2%	6.0%
Injecting Drug Use (IDU)	3.8%	
Health Facility Related	2.5%	1.9%
<b>Number of New Infections</b>	<b>76,315</b>	<b>25,195</b>



**Figure 9: Distribution of New Infections in Coast Province****BOX 1 – The Case of the Nyanza Fishing Communities**

As noted, a high prevalence rate has been noted in the fishing communities along the shores of Lake Victoria. There are two definitions for people who are involved in fishing, ‘fisher folk’ refers to fishermen and fisherwomen who are involved in catching fish, fish processing and trading. However in this study we used the definition for **“Fishing Communities”** which is broader and includes persons resident in a port, village or fish landing station where fishing is a prominent occupation.<sup>59</sup> The second definition includes fishermen and women, fish processors, traders and transporters, boat owners, hotel and bar owners and beer sellers in addition to all other persons resident in the community who are dependent on or engaged directly or indirectly in the harvesting or processing of the fishery resources to meet social and economic needs.

These communities have a documented high HIV prevalence rate (30%) as well as a very high rate of STIs, and there has been some research looking at factors that could be contributing to the high prevalence in these populations,<sup>60 61</sup> including the custom of *jaboya*, where the fishermen demand sex from the women fish traders in exchange for product.

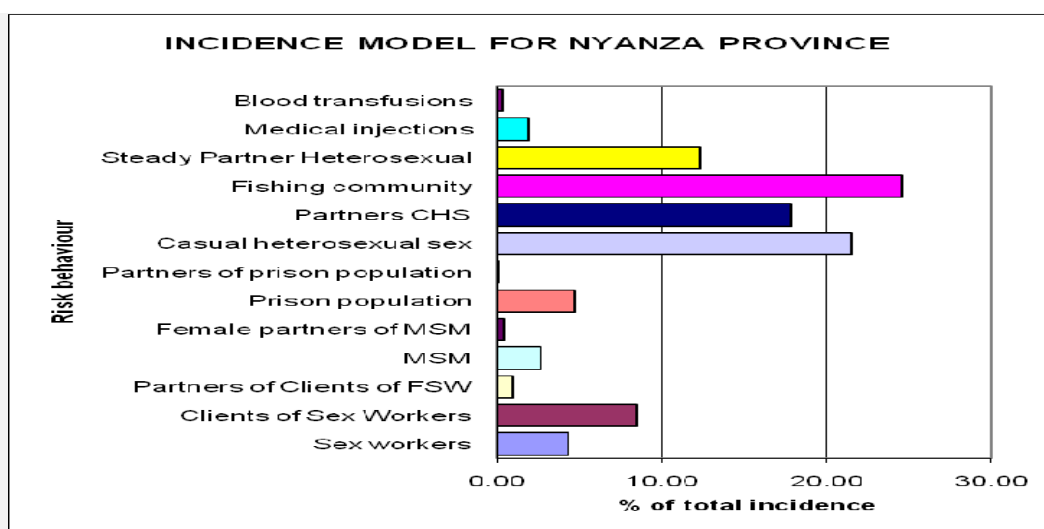
A large proportion of the people in Kenya living with HIV (perhaps 30%) live in Nyanza. The model results in Table 6 and Figure 11 show that almost 90% of new infections in Nyanza were in people having casual heterosexual sex and their partners, sex workers and their partners, and steady partner heterosexuals. In an attempt to understand where these infections are occurring, the model was also run with “fishing communities” as a separate category, and the results are shown in figure 10 and table 7. **It can be seen that fishing communities may be contributing 25% of all new infections in Nyanza.**

*Box continues on next page*

<sup>59</sup> GLIA, 2008.

<sup>60</sup> Kissling E. et al 2005

<sup>61</sup> Bukusi EA et al. 2006

**Figure 10: Percent of total incidence by transmission modes and sub-population in Nyanza, including Fishing Communities****Table 7: HIV Prevalence, Incidence and % incidence by mode of exposure for Nyanza Province, (including fishing communities)**

Adult Risk Behaviour	Number HIV+	Incidence	% of incidence
Casual heterosexual sex & partners	119,978	8,103	39.32
Fishing community	75,846	5,078	24.65
Sex Workers & Clients	22,002	2,822	13.7
Steady Partner Heterosexual	42,014	2,538	12.32
MSM & Prisons	4,334	1,605	7.79
Health Facility related	297,874	458	2.22
<b>TOTAL ADULT POPULATION</b>	<b>269,257</b>	<b>20,604</b>	

According to Seeley (2005) fishing communities have been identified as among the highest-risk groups for HIV infection in countries with high overall rates of HIV prevalence. Men and women living in fishing villages across the world have been found to be between five and ten times more vulnerable to HIV than other communities. Their vulnerability stems from: the amount of time spent away from home; access to cash income; poor education; the ready availability of commercial sex in fishing ports; and sub-cultures of risk-taking and hyper-masculinity. The highly mobile fishermen, and fish processors, traders and transporters who are both men and women, moving between landing sites, local markets and fish processing factories on a daily and seasonal basis, act to further compound the problem. In addition, the lack of women's rights in many fishing communities makes them more vulnerable to infection; drug and alcohol abuse among fishermen is another contributory factor.

In a speech made during the 2005 FAO workshop in Rome, “*AIDS in fishing communities: a serious problem, frequently overlooked: FAO teams up with experts to suggest policy fixes*”, George Kourous<sup>62</sup> reported that HIV/AIDS was undermining entire food production systems, systems that people depend on for their food and incomes. Fishing and a whole range of economic activities associated with it -- processing, selling, transporting, and net making -- make crucial contributions to household incomes in many developing countries, boosting food security and allowing a richer, healthier diet.

<sup>62</sup> <http://www.fao.org/newsroom/en/news/2005/100061/index.html>

## 2.5. What do the Incidence Modelling results tell us?

### 2.5.1 National Modelling Analysis

The National model for Kenya showed that the majority of new infections in 2006 occurred through heterosexual contact, with the most vulnerable being the steady partner heterosexual group, the casual heterosexual group and their partners. The introduction of long distance truck drivers as a separate category for clients of sex workers has shed light on the continuing vulnerability of truck drivers as well as other modes of exposure in specific groups such as MSM, the fishing communities and men in prisons. The model indicated that nationally, these modes of exposure need intervention.

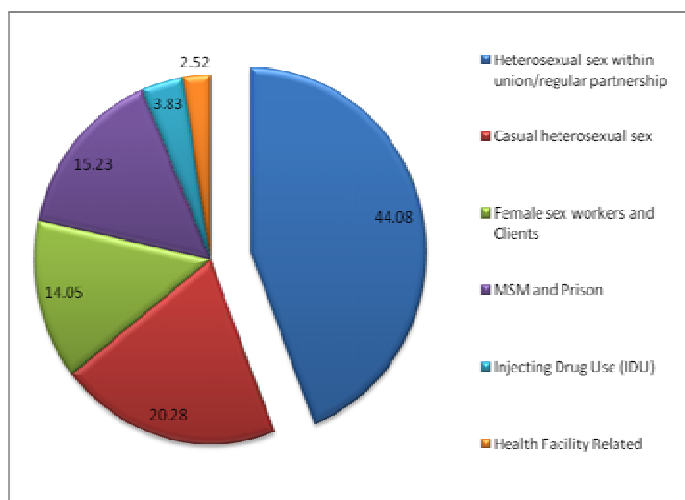
The model also demonstrated that MSM, including men in prisons, a hitherto overlooked population in Kenya, may be contributing a significant percentage of new infections. The data around these communities remain incomplete, and while the National model indicated that MSM and men in prisons combined account for perhaps 13-14% of new infections, the model for Nairobi placed this group's contribution at 17% and in the Coast it was more than 20%, about one-fifth of new infections.

Although the number of IDUs in the population is low, this is a group with a high potential to transmit HIV, reflected in the extremely high incidence rates in the model.

Nationally 44% of new infections in the adult population occurred within heterosexual relationships among people in unions or with regular partners, 20% through casual heterosexual contact, 14% in sex workers and their clients, 15% in prison populations and MSM, together accounting for more than 90% (figure 11).

The KAIS 2007 also revealed a high incidence in Rift Valley and the rural areas of the country. The three provinces that were sampled in this study account for perhaps 45% of all new infections. Further analysis needs to be undertaken to determine whether and how patterns of behaviour and incidence differ in the rest of the country where the remaining 55% of transmission occurs.

**Figure 11: Distribution of new infections in Kenya**



### 2.5.2 Provincial Modelling Analyses

The provincial analyses using the model provided useful insights into the nature of the epidemic within the provinces. It also reinforced the perception that HIV in Kenya is geographically heterogeneous, as well as the fact that the highest proportion of new infections occur in Nyanza Province. The analysis was limited to provinces that had adequate data to apply the model: the Coast, Nyanza, and Nairobi. Patterns of infection might be quite different in other provinces in which the model was not applied.

The statistics from the model identify Nyanza Province as having the highest number of infected persons (270,000) and the highest number of new infections (22,646) in 2006. Over 70% of new

cases of HIV occurred in fishing communities, in people who had casual heterosexual sex and their partners and in the steady partner heterosexual group. The most vulnerable group seems to be individuals involved in the socio-economic networks around fishing communities -- fishermen and women, boat builders and repairers, fish processors and sellers, bar owners and workers, and people who play supportive roles within the landing beaches and towns.

The enhanced HIV prevalence and incidence rates observed in Nyanza province may indicate a significant historical and cultural difference in the epidemic in Nyanza compared to the rest of the country, with the hypothesis that the cultural practices and sexual behaviours among the communities of the lake region place them at greater risk compared to other communities in Kenya and within the province itself.

In Nairobi, the main modes of HIV transmission are through heterosexual sex within unions or regular partners, casual sex, and among MSM/prison populations and sex workers and their clients (in that order). These four groups account for over 90% of new infections. IDU contributed a high number of new infections amounting to 6%. As risk groups, IDU and MSM go unrecognized and are discriminated against. HIV incidence rates among injecting drug users (IDU) and their partners, MSM and the prison population are high. These groups currently have the highest rates of infection within Nairobi.

Over 90% of new infections in the Coast region occurred among adults who engage in heterosexual sex within unions or regular partnerships, MSM and prison populations, sex workers and their clients and those who engage in casual sex. There are differences in the ordering of the groups in the coastal region compared to the other regions. In all the three provinces, most transmission occurs through heterosexual sex within unions and with regular partners, however in the coastal regions this is followed by the MSM and prison populations, then sex workers and their partners, and finally casual sex. IDU contribute a higher proportion of new cases in the Coastal regions than in Nairobi.

The observations from the model are confirmed by reports from KDHS (2003),<sup>63</sup> where 40% of adult men engage in high risk sex, compared to 17% of women. The KDHS 2003 identified the Coastal region as having the highest percentage of men (19.2%) reporting multiple sexual partners of all regions in Kenya. The high number of new infections in partners is due to involvement in high risk sex by people in each of the various groups with high rates of infection.

Compared to other parts of Kenya, IDU and MSM behaviours are more common in the coastal region and although hidden, there are reported cases where marriages between men have occurred.<sup>64</sup> As well, because the coastal region is a prime tourist destination, there are more male and female sex workers than in other parts of the country. The contribution of these risk groups to the total number of new HIV infections is higher than in other regions. Furthermore, the high incidence rates among IDUs and their partners in particular, as well as in prison population and MSM, indicates that the epidemic is being transmitted much more rapidly in these groups than in the general population.

The 25,000 new infections in Nyanza province were more than double the number (10,000) in Nairobi. Historically Nyanza has had the highest HIV prevalence in Kenya for an extended period. The three main sources of new infections which contributed over 90% of new cases were sex within unions and regular partnerships, sex workers and their clients and casual sexual relationships.

<sup>63</sup> Kenya Demographic and Health Survey 2003.

<sup>64</sup> Kiama W. 1999.

The high contribution of the fishing communities in Nyanza reflects both their high prevalence and their high numbers. The Fisheries Department in Kenya has estimated that a total of 798,000 people were directly or indirectly supported by the fishing industry, including 34,000 fishermen, 238,000 dependants and 596,000 people engaged in the provision of support and ancillary services. Most of these people live in the Lake Victoria region, an area with limited alternative economic opportunities because of low rainfall, poor soils and a shortage of paid jobs. The fishing industry in Nyanza is estimated to contribute to 25% of the country's total employment in the informal sector and 14.5% of the country's total employment.

## 2.6. Limitation of models

The three salient points to bear in mind are:

- Models are often based on incomplete data and assumptions, and will therefore never be perfect.<sup>65</sup> The results of any model are only as good as the data entered.
- Uncertainty around model estimates also depends on the structure of the model, which is based on assumptions and understanding of the epidemic; the model parameters, some of which are uncertain; and on the data sets used in the modelling exercise which contain further uncertainties.
- Mathematical models cannot and should not replace surveillance data, but as data accrue they can provide a framework to analyse and communicate results.<sup>66</sup>

The modelling exercise in Kenya has demonstrated a number of these limitations in the UNAIDS Model. The earlier results of Gouws et al. found that more than 80% of infections arose from heterosexual transmission, and the attempt to disaggregate this population, especially the clients of sex workers, has resulted in a very large percentage of infections being attributed to “long-distance truck drivers” and “fishing communities”. It is likely that while these groups are indeed at high risk of infection, the infections attributed to them may also include cases in other clients of sex workers.

Similarly, the data available on MSM and IDUs come from relatively few studies, and the amount of transmission attributed to these two groups may also be an overestimation.<sup>67</sup>

But these caveats aside, it is clear that heterosexual transmission is the most prominent of all the modes of transmission in all areas of Kenya. The next chapter summarises the risk behaviours and related factors known about each population, as well as changes over time, in an attempt to (a) provide reasons for changes in HIV prevalence and the reduction in new infections, and (b) to point to specific risk behaviours, target populations, and geographic areas (hot spots) that should be subject to intensified HIV prevention efforts.

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<sup>65</sup> Ulrich CM, Nijhout HF, and Reed MC. 2006

<sup>66</sup> Garnett GP. 2002

<sup>67</sup> For instance, anecdotal information from the Coast indicates that many heroin users are smokers, rather than injectors, so the estimated number of heroin users is not equivalent to the number of injection drug users, who are the population at risk of HIV transmission. An earlier version of this report estimated an even larger role for IDUs in transmission, but further analysis indicated that the original figures used to compute the numbers of IDUs were overestimates.

## CHAPTER 3. FACTORS INFLUENCING HIV TRANSMISSION IN KENYA

Like everywhere else in sub-Saharan Africa, and from the earliest days of the epidemic, HIV transmission in Kenya overwhelmingly has been associated with unprotected heterosexual sex: either casual, with sex workers, or within long-term relationships. Factors at the individual level, community level and macro level (structural level) all have an impact on susceptibility to HIV infection, perceptions and knowledge about HIV transmission risk, higher risk behaviour, and therefore the risk of HIV transmission during heterosexual contact.<sup>68</sup>

### 3.1. Individual Level Factors that Influence the Risk of Heterosexual HIV Transmission

As is well-known, the risk of acquiring HIV through sexual intercourse at the individual level is mostly related to:

- The *nature of sexual behaviour* - A recent review of the literature<sup>69</sup> demonstrated that the commonly held figure of 1 transmission per thousand coital acts was probably at the lower bound, with other factors raising the risk by as much as a factor of 10 (one transmission in 100 acts). Some of these other factors include.
- *Male circumcision status*.
- *The viral load of the HIV positive sexual partner* (transmission is more likely to occur when having sex during the first 6 to 8 weeks after primary infection when the viral load is highest, or during late-stage infection, when the viral load again rises).
- *The correct use (or not) of a barrier method* for HIV prevention – male or female condom.
- *The susceptibility* of the person exposed – e.g. presence of other STIs that would facilitate viral entry.
- *The pathogenicity of the virus* (there is evidence that some viral clades may be more virulent).<sup>70</sup>

It is the increased risk of transmission that occurs in conjunction with a range of biological and behavioural co-factors that exacerbates overall risk and increases HIV incidence – in particular viral load in conjunction with having concurrent sexual partners.

A summary of Kenyan data<sup>71</sup> about these individual level factors – sexual behaviour, male circumcision status, multiple concurrent partners, condom use, and STI prevalence – are presented below.

### 3.2. Changes in Sexual Behaviour in the General Kenyan Population

a) **Sexual debut** generally occurs in the age group 15 to 19 years, with low condom use during first sex. Nearly 14% of women and nearly 30% of men said their sexual debut was before the age of 15.<sup>72</sup> The BSS among unmarried out-of-school youth reported that 48% of the women and 67% of the men aged 15-19 had had sex. Distressingly, less than 25% reported that

<sup>68</sup> Fraser-Hurt N et al; 2008 (in press)

<sup>69</sup> Powers KA et al; 2008

<sup>70</sup> John-Stewart et al, 2005

<sup>71</sup> The two main sources of information on sexual behaviour in Kenya come from the Behavioural Surveillance Survey (BSS) which was conducted in 2002-2003 among 17,800 respondents drawn from seven “high risk” populations<sup>71</sup>, and the 2003 Demographic and Health Survey (KDHS) which sampled 8,195 women aged 15-49 and 3,578 men aged 15-54 selected from 9,000 households in 400 clusters throughout the country.

<sup>72</sup> Kenya Demographic and Health Survey (KDHS) 2003

they had used a condom at their first sex. Early sexual activity displayed a regional variation, with abstinence among young people highest in the Northeast province (76%) and lowest in Suba district (10%).<sup>73</sup>

Median age at first sex has shown only a slight increase in the past 15 years, and is the same for men and women: rising from 16.8 to 17.8 in women, and from 16.8 to 17.1 in men. The question then arises as to why young women have a prevalence rate four times higher than young men. A number of factors may be contributing to this, including the biological vulnerability of young women, prevalence rates of reproductive tract infections (such as bacterial vaginosis), sexual practices (e.g. anal sex<sup>74</sup>) and the HIV status of their partners. The commonly held belief that more young women contract HIV because of their liaisons with older men is discussed in the next paragraph. The risk for younger women is not that they have sex earlier than young men, but may be rather who they have sex with, but this requires further research.

b) **Inter-generational sex** may not be as frequent as generally believed. The Kenyan DHS in 2003 found that of women age 15-19 who had higher-risk sex in the past 12 months; only 4% indicated that this was with a man who was ten or more years older than them.<sup>75</sup> Inter-generational sexual relationships have been cited in Kenya and elsewhere as the reason behind the higher prevalence of HIV among young women (as compared to young men), but these data suggest that there must be other factors, perhaps related to their biological susceptibility. However, a study conducted in Kenyan towns<sup>76</sup> found that among young women who engaged in inter-generational sex the primary incentive for engaging in such relationships is financial and pressure from peers to find older partners. Such couples rarely use condoms. Material gain, sexual gratification, emotional factors, and recognition from peers override concern for STI/HIV risk. Women's ability to negotiate condom use is compromised by age and economic disparity.

c) **The total fertility rate** decreased between the 1980s and 1998, after which a slight increase in the fertility rate is evident. The greatest increase in the fertility rate has been in Nyanza Province, which some have suggested may be related to the high HIV prevalence (fertility rising to compensate for the community mortality from AIDS).<sup>77</sup> Contraceptive use among married women remained essentially unchanged between the 1998 and 2003 KDHS surveys (39% and 41% respectively), but the desire for children seems to have increased slightly.

d) The **male circumcision rate** differs dramatically in Kenya, and is lower in provinces with higher HIV prevalence. Figure 12 illustrates that of the 10 districts with HIV prevalence higher than 7%, seven are in Nyanza province where circumcision rates are low, including two – Homa Bay and Suba, with HIV prevalence above 20%. Further, HIV prevalence in Nyanza Province is 21.1% among uncircumcised men and 2.1% among circumcised men, a 10-fold difference. Similarly, HIV prevalence in Nairobi is 6.6% among circumcised men and 13.5% among uncircumcised men.<sup>78</sup> Another district with higher HIV prevalence is Mombasa (11.7% HIV prevalence), which, like Nairobi is a magnet for migration from all parts of Kenya and has significant uncircumcised communities.

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<sup>73</sup> KDHS 2003

<sup>74</sup> Anecdotal reports indicate that some young women engage in anal sex (a higher-risk route for HIV transmission), both to prevent pregnancy and to “preserve virginity”.

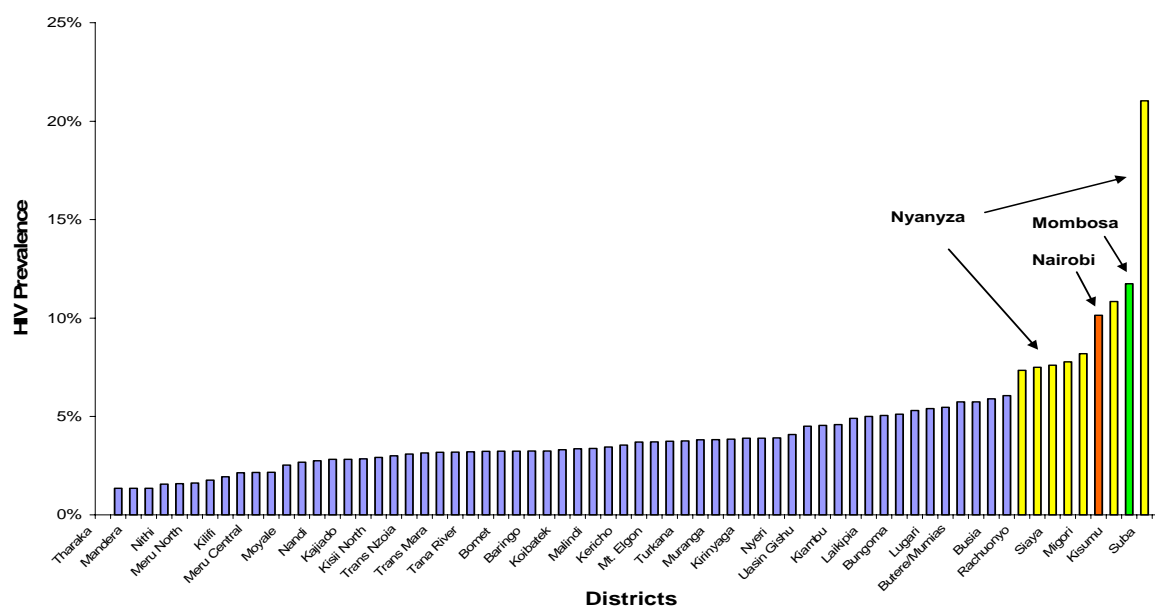
<sup>75</sup> KDHS 2003

<sup>76</sup> Longfield K et al.; 2004

<sup>77</sup> KDHS 2003

<sup>78</sup> Bailey RC et al, *ibid.*



**Figure 12: HIV prevalence in districts in Kenya carrying out HIV sentinel surveillance, 2006**

Source: data extracted from 2006 Surveillance

e) **Reduction in the number of persons who had multiple sexual partners in the last 5 years:** In the 2003 KDHS, 2% of the women and 12% of men had more than one sexual partner in the last 12 months<sup>79</sup>, but these relatively low numbers do not reflect the high rates of multiple partnering in some sub-populations - Table 8 provides more detail. As can be seen, all groups report a significant rate of non-regular sex partners, and the rate of condom use in these encounters is relatively low, especially amongst the youth, where condom use with non-regular partners is less than 50%.

**Table 8: Multiple, non-commercial sex partners in the past 12 months in Kenya (2002 and 2003), and condom use**

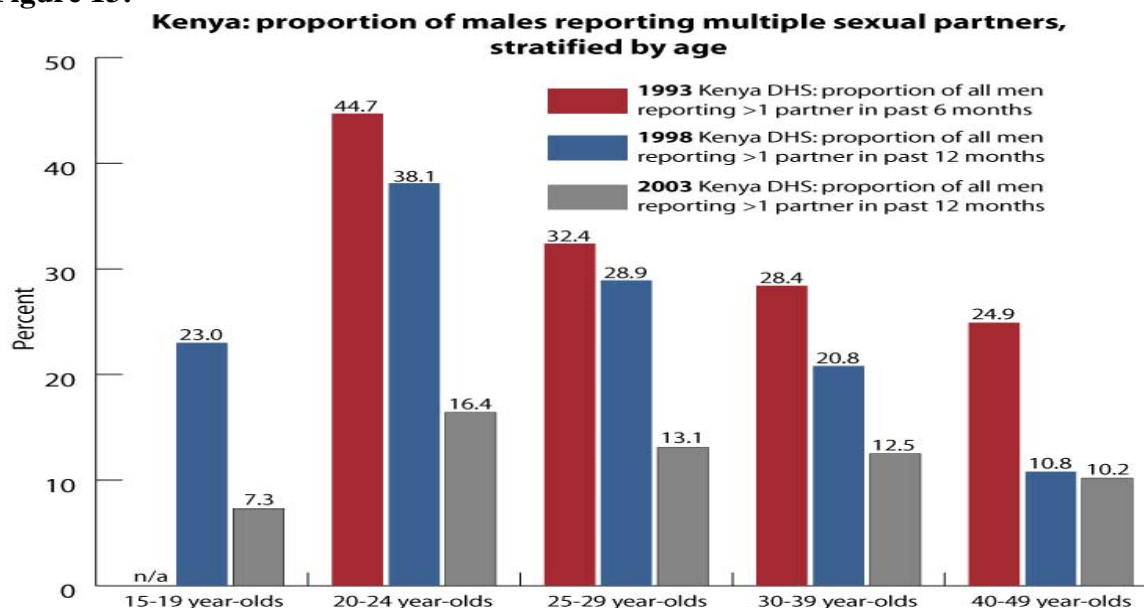
Population	Had multiple non-commercial partners in past 12 months (%)	Used condom at last sex with non-regular partner (%)
out-of-school / never-married females 15-19	20 (BSS)	35 (BSS) 23 (KDHS)
out-of-school / never-married males 15-19	45 (BSS)	40 (BSS) 41 (KDHS)
out-of-school / never-married females 20-24	20 (BSS)	36 (BSS) 28 (KDHS)
out-of-school / never – married males 20-24	46 (BSS)	40 (BSS) 51 (KDHS)
KDHS Women 15-49	2	24
KDHS Men 15-49	12	47
BSS men in worksites	21	57
BSS policemen	35	68
BSS Matatu drivers	47	56
BSS bodaboda	42	55
Low-income women	12	39

Source: Extracted from AIDS in Kenya 2005, NASCOP

However, despite these rather grim statistics (especially the percentage of the younger population engaging in risky sex), the data from three successive KDHS seem to indicate that Kenyans are indeed changing their behaviour, at least as far as reducing their number of partners, as seen in Figure 13.

<sup>79</sup> KDHS 2003



**Figure 13:**

Source: Collated from Kenya DHS reports 1993, 1998, 2003

f) **Changes in levels of Condom Use:** Both the 2002 BSS and 2003 KDHS noted a continued low rate of condom use with non-regular partners and during the last higher risk sex, especially amongst the youth, where condom use with non-regular partners is less than 50%. As noted in Table 8 above, 24% of women and 46% of men who had had sex with more than one partner in the previous 12 months reported using a condom in their last sexual encounter. More recent data are not available.<sup>80</sup> Sex with casual partners or sex workers without a condom is prevalent. Out-of-school youth in particular tend to engage in early and unprotected sex.<sup>81</sup> Women in low-income settings were the least likely of the risk groups in the 2002 BSS to use a condom.

In the 2002 BSS, 88% of female sex workers stated that they used a condom at the last sex with a paying client, but only 50% used a condom with non-paying clients, reflecting the long-standing perception that risk is reduced with “steady” clients or boyfriends. A 2007 study found a similar pattern – a high rate of condom use with casual clients, but much less with boyfriends/partners and also with regular clients who are considered “safe”.<sup>82</sup> This is particularly true with young or adolescent SWs who may lack the knowledge of how to protect themselves from infection but also lack the negotiating skills and bargaining power of their older colleagues<sup>83</sup> and consequently use condoms only sporadically.

A 2007 study conducted in Mombasa among men who have sex with men (MSM) showed that 28% consistently used a condom with regular partners and 39% with casual partners.<sup>84</sup>

g) **Presence of STIs:** There seems to have been a reduction in the high rates of STIs in Kenya, such as gonorrhoea, syphilis and chancroid, that were first noted thirty years ago, which

<sup>80</sup> The same data were cited in the Kenya report to UNGASS in 2008.

<sup>81</sup> The 2002 BSS reported that the reasons for youth not using condoms were unavailability (22%) and dislike for them (18%), and it will be of interest to see if either of these parameters change in subsequent surveys.

<sup>82</sup> Ferguson et al ibid

<sup>83</sup> Govt. of Kenya / UNICEF, Child sex work on the Kenyan coast, 2006

<sup>84</sup> Sanders et al. 2007

may or may not have contributed to the declining HIV prevalence in recent years,<sup>85</sup> but experience elsewhere should be a warning that STIs have a tendency to reappear. The KAIS 2007 survey tested blood samples for both herpes simplex virus (HSV-2) as well as syphilis, and the results for HSV-2 demonstrated a 35% infection rate among Kenyans in the 15-64 age group.<sup>86</sup> Half of all individuals age 35-64 are infected. Among those with HSV-2, the HIV prevalence is 17% as compared to 2% in those without HSV-2, reinforcing the well-known relationship between HIV-1 and genital ulcer disease. Because of the increased risk of transmission and acquisition of HIV in the presence of genital ulcers, the continued monitoring of STIs in Kenya should be part of the normal surveillance of HIV trends in the country.

### 3.3. Sexual behaviour in key sub-populations at risk of HIV

#### 3.3.1 Sex Workers

a) Commercial sex work takes place, and sex workers (and their partners) have higher risk behaviour and higher risk of infection than the general population. The number of sex workers in Kenya is unknown, but is estimated to be well over 100,000.<sup>87</sup> It is estimated that there are 60,000 sex workers in Nairobi alone,<sup>88</sup> but this figure will only be confirmed in 2009.<sup>89</sup> Sex workers are at increased risk of HIV infection (and transmission to their partners) because of frequent and frequently-unprotected sex with multiple casual and concurrent partners, other risky sexual practices, their illegal and stigmatised status, the young age at which they initiate sex work, their reluctance to attend clinics, and the lack of clinics catering to their special needs.

b) Sex work in some areas is sometimes condoned by families. The UNICEF study of underage sex workers noted that because of the high rates of poverty in Coast Province (once away from the resort hotels) many families condone sex work by their teenagers as a more lucrative way of obtaining the household income than menial labour.

c) There is a wide range in sex workers' numbers of sexual partners. Several studies of sex workers in Kenya (along the Mombasa highway, in Mombasa<sup>90</sup> and Nyanza<sup>91</sup>) show great variations in frequency of sexual partnering among SWs.<sup>92</sup> The number of different partners per month ranged from 1-79 (mean 14) and the number of sexual acts ranged from 3-192 (mean 54). In many cases casual clients outnumbered regular clients by over 4:1, but this was not consistent.

d) In most cases, the clients of sex workers were not truck drivers, but local residents, forming a bridge population with the general population. The Mombasa Highway sex worker

<sup>85</sup> Five of six treatment trials of bacterial STIs in Africa did not have any effect on population-level HIV incidence (Gray & Wawer, 2007), and two trials on HSV-2 suppression on HIV acquisition were similarly discouraging (Cohen, 2008)

<sup>86</sup> KAIS 2007, op cit

<sup>87</sup> For the model, it was estimated that 2% of the population were sex workers, while the KDHS 2003 used an estimate of 5%, but that included all persons who received any sort of gifts, money, etc. in exchange for sex.

<sup>88</sup> NACC (National AIDS Control Council). 2007. Report of the provincial/regional harmonization workshop, 10 August 2007. Unpublished (taken from the 2008 UNGASS Report). This figure would include the obviously commercial sex workers, as well as women engaged in transactional and male sex workers also.

<sup>89</sup> UNFPA, personal communication

<sup>90</sup> Hawken M et al op cit

<sup>91</sup> Voeten et al.; Clients of Female Sex Workers in Nyanza Province, Kenya: A core Group in STD/HIV Transmission. Sex Transm Dis, 2002 29(8):444-452

<sup>92</sup> Ferguson AG et al.; *ibid*.

mapping found that more than 60% of the sex workers' clients were NOT truck drivers, but other travellers on the highway, or local residents (police, school teachers, merchants).<sup>93 94 95</sup>

e) More worrying than the high number of women who can be identified as sex workers are the even greater number of women, especially young women, who engage in "transactional sex" -- so-called "part-time" female sex workers who do not consider themselves sex workers, and are not considered as sex workers by their partners. The 2003 KDHS noted that 16% of girls 15–19 report receiving money, gifts or favours for sex in the past 12 months. Whether these women come from a certain strata, or whether they cut across many levels of Kenyan society requires further investigation.

In summary, it can be appreciated that because of the frequency of concurrent<sup>96</sup> partners and a lack of consistent condom use, sex workers and their partners and other women involved in transactional sex remain key populations at risk of HIV infection, and a most at-risk population.

### 3.3.2 Mobile Persons (Voluntary mobility for economic reasons, or forced mobility)

a) Sexual behaviour of *long-distance truck drivers* also increases their risk to HIV infection. The factors that contribute to truck drivers' vulnerability have been well-described, and include long separations from spouses and family combined with the long and monotonous hours of work leading to loneliness and isolation. In the study of truck drivers along the northern corridor<sup>97</sup> from Mombasa to Uganda, almost 62% spent fewer than 40 nights at home in the year prior to survey. The most common type of relationship was a casual one with a female sex worker, accounting for over one-third of all recorded relationships. The report concludes that almost one-third of truck drivers have unprotected sex with casual partners.

b) *Fishermen and fisherwomen and the populations that interact with them* form an intricate and extensive sexual network, increasing the risk of HIV transmission. There are approximately 55,000 fishermen (the total population in the fishing communities in Kenya is approximately 286,000), who are at increased risk of HIV transmission because of: the mobile nature of their occupation, the availability of sex workers, low levels of condom use, and certain cultural practices. The modelling has demonstrated the significant percent of all new HIV infections that occur in these communities.

c) While it is generally assumed that the *uniformed services personnel* (police, military etc.) are at increased risk of HIV infection, this has not been established categorically due to a lack of access to data. Therefore, more data and/or research are needed.

d) *Refugees and Internally Displaced Persons* (IDPs) may have different sexual behaviour than the surrounding community, and may not be at increased risk of HIV transmission. Their sexual behaviour therefore needs to be understood separately from that of the surrounding population. Until the events of early 2008, the populations of refugees and internally-displaced persons (IDPs) in Kenya were not large enough to be significant contributors to HIV

<sup>93</sup> University of Nairobi (2000). Behavioural Surveillance & STD Seroprevalence Survey Western Province, Kenya. Female Sex Workers

<sup>94</sup> Ferguson AG et al.; Using diaries to measure parameters of transactional sex: an example from the Trans-Africa highway in Kenya. *Culture, Health & Sexuality*, 2006, 8(2):175-185

<sup>95</sup> Ferguson A and Morris C; Mapping Transactional Sex on the Northern Corridor Highway in Kenya; *Health and Place* 13:504-519, 2007

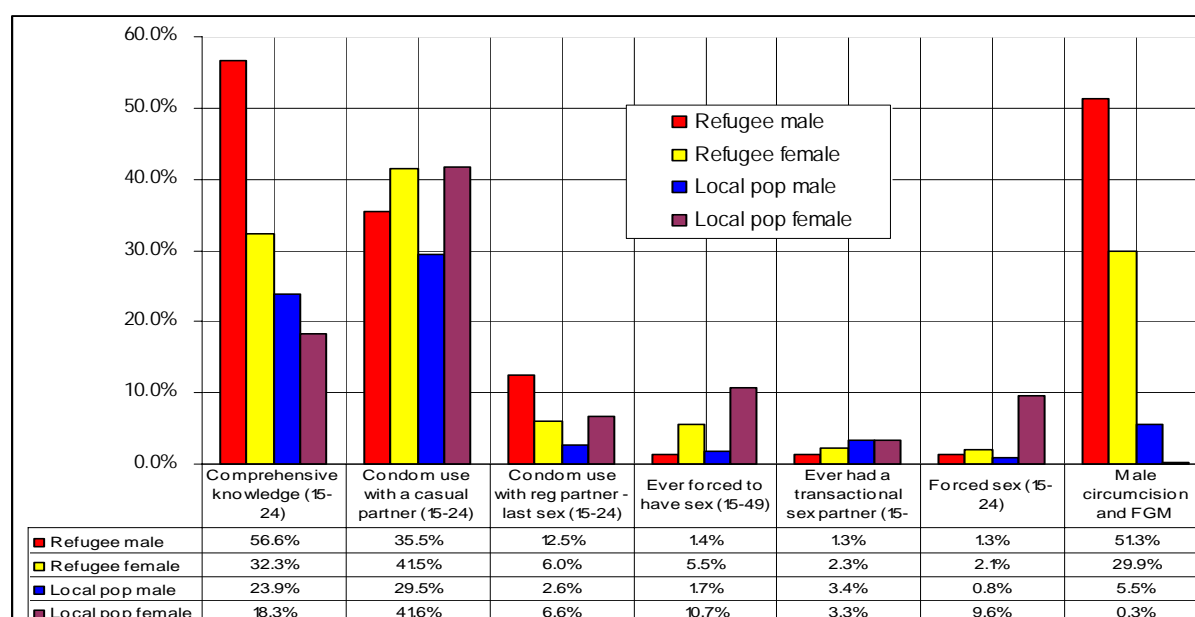
<sup>96</sup> These concurrent partners include not only the clients of the sex workers, but also those whom they would consider to be their boyfriends, husbands or steady partners

<sup>97</sup> Morris C and Ferguson A; Hot spot mapping of the northern corridor transport route: Mombasa-Kampala. Final report. December 2005. Ministry of Transport

epidemiology. However, the 2008 post-election violence created a substantial population of IDPs and those suffering from violence, rape, etc. As of this writing, the numbers of displaced people have been greatly reduced, but the effects of the disruptions may still be felt in the coming months and years.

There is a body of recent data on sexual behaviour of refugees and host populations collected through BSSs in Kakuma camp and town in Kenya.<sup>98</sup> The epidemiological and behavioural data provide evidence that commonly held beliefs about refugees' vulnerability and HIV risks may be wrong: compared to the local population, refugees had fewer partners in the 12 months preceding the survey, higher levels of knowledge, fewer incidences of transactional sex, and lower incidences of forced sex (Figure 14).

**Figure 14: Differences in sexual behaviour between the refugee population of Kakuma refugee site and the surrounding community in North-eastern Province, Kenya, 2004**



Source: UNHCR and GLIA, 2004<sup>99</sup>

Therefore, the most important factors that put refugees and IDPs at risk for HIV may not be related to their dislocation, trauma and the lack of decent health services, but rather to the level of HIV in their home districts compared to where they temporarily resettle, the amount of interaction between the refugees and the local population, rates of circumcision in the refugee population compared to local males, etc., and some of these factors may vary widely between different camps, even in the same country.

e) **Prisoners** are a small population, but the risk of HIV transmission is higher than in the general population, due to the specific conditions in prisons and the legislative environment. Under Kenyan law, male-to-male sex is a criminal offence, and the legislation also excludes MSM from the government's HIV programmes.<sup>100</sup> Kenyan law prohibits sex in prison, so conjugal visits are banned. The slow response to high HIV/AIDS levels in prison is mainly due to weak and outdated legislation, as well as religious and cultural inhibitions.

<sup>98</sup> UNHCR/GLIA-Ke (2004). Behavioural surveillance surveys among refugees and host populations, Kakuma.

<sup>99</sup> UNHCR/GLIA-Ke (2004). Ibid.

<sup>100</sup> IRIN, 2007 Kenya: Slow response to high HIV rates in prisons -<http://irinnews.org/Report.aspx?ReportId=74055>

### 3.4. Community Level Factors Influencing the Risk of Heterosexual HIV Transmission

a) **Perceptions and Knowledge about HIV:** Both the 2002 BSS and 2003 KDHS demonstrated a high level of AIDS awareness through practically the whole country (the exception being the sparsely populated Northeast). Awareness of AIDS was almost universal, with 75% of both male and female respondents personally knowing someone who has AIDS or died of AIDS-related causes. As well, most adults in the KDHS knew about HIV prevention measures, although it is notable that “abstinence” and “faithfulness” were suggested more often than condoms. Youth aged 15-19, the less educated and the poor were not as aware, as noted in Table 9. It is also notable that of all the groups surveyed, female sex workers had the highest level of knowledge.

**Table 9: Awareness of HIV prevention methods (%) in Kenya, 2003**

Population	Abstinence	Faithfulness	Condoms	Know all three
KDHS women 15-49	79	81	61	58
KDHS men 15-49	89	89	72	70
BSS in school youth females 15-19	80	63	<b>30</b>	<b>25</b>
BSS in school youth males 15-19	75	62	<b>42</b>	<b>26</b>
BSS out-of-school youth females 15-24	82	77	<b>56</b>	<b>44</b>
BSS out-of-school youth males 15-24	86	80	66	53
BSS female sex workers	89	85	91	73

**Source:** Table extracted from AIDS in Kenya 2005, NASCOP

b) **Prevalence and acceptance of sexual violence:** In the 2003 KDHS, 49% of Kenyan women reported experiencing violence, and one in four had experienced violence in the previous 12 months. Over 60% of women and children who have been abused did not report the event to anyone. Only 12% of Kenyan women who have been physically or sexually abused reported to someone in authority such as a village elder or police. As well, 25% of 12–24-year-olds lost their virginity by force. Sixty percent of women who have experienced violence reported age at first abuse was between 6 and 12 years (34% at age 10; 20% at 12); 24% between 13 and 19 years (35% age 15) (Johnston 2002). A more recent study of female patients at an STI clinic in Nairobi found that HIV positive women had an almost two-fold higher level of lifetime partner violence; HIV prevalence was 39% in women with a history of partner violence and 27% in women without such a history (prevalence 1.4 times elevated).<sup>101</sup>

c) **Social norms that hinder or facilitate HIV prevention:** Much work has been done to try to change the course of the HIV epidemic by educating individuals about HIV risks and advocating for individual-level behaviour change. The rationale for individual-focused interventions is the assumption that sexual behaviour is shaped mainly by conscious rational individual decisions.

However, one study after another has shown that people often knowingly engage in sexual behaviour that places their health at risk, and it is being increasingly appreciated that a major factor that contributes to most-at-risk sexual behaviour is the cultural norms and values that exist in the community where the individual resides, especially among the people with whom an individual interacts and social groups to which they belong.<sup>102</sup> Some authors, in attempting to define the factors influencing HIV risk, place these community level/societal norms at an intermediate level between individual behaviours and the more macro structural issues over which individuals and communities have less control.<sup>103</sup>

<sup>101</sup> Fonck K et al. 2005.

<sup>102</sup> Campbell, C 2003.

<sup>103</sup> Poundstone et al. 2004.

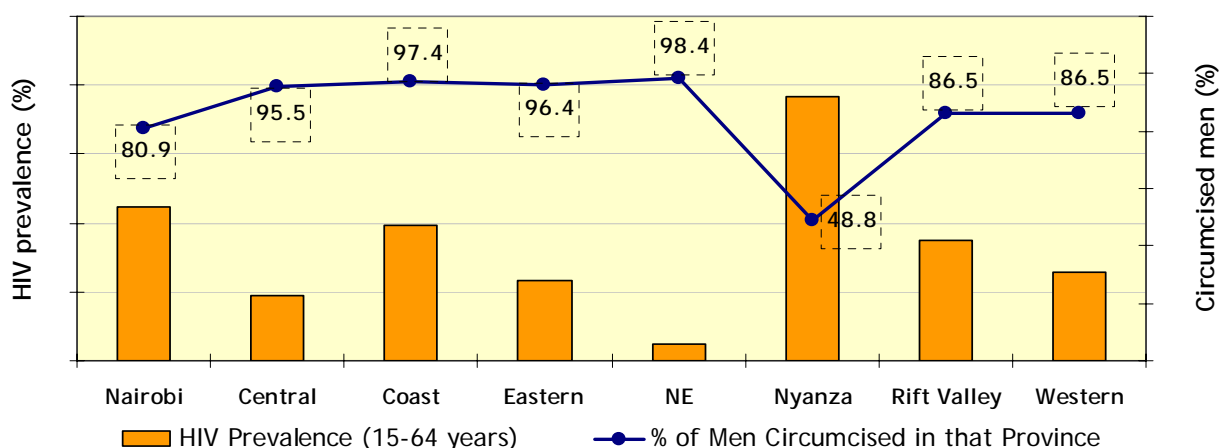


There have been a number of studies looking at cultural aspects of the HIV epidemic in Kenya, noting that “ethnicity was significantly associated with risky sexual behaviour”<sup>104</sup>, and that “an understanding of socio-cultural norms is central to the success of intervention programs”<sup>105</sup>, and more information is emerging about specific community practices regarding sexual initiation traditions and other practices<sup>106 107 108</sup> but very little has been written about behaviour change coming about as a result of changes in societal norms.<sup>109</sup>

Two factors considered to be chief determinants of the HIV epidemic level in Kenya are strongly associated with culture: male circumcision (a cultural ritual or practice that is more common in some communities than others), and societal acceptance of concurrent multiple partnerships (cultural norms of the acceptability of multiple concurrent partnerships).

As noted earlier, although different communities practice various forms of circumcision, some communities, particularly the Luo (who live mainly in Nyanza and in major urban centres such as Nairobi and Mombasa) do not circumcise. This may be contributing to higher prevalence of HIV in Nyanza and in the other centres where Luos live (figure 15).

**Figure 15: % of circumcised and uncircumcised men by Province**



Source: KAIS 2007

Poverty within this community, strong cultural practices and the low status of women in rural settings may also be key risk factors associated with the high prevalence of HIV in Nyanza.

Cultural norms such as wife inheritance and “widow cleansing”, polygamy, sex for fish “jaboya”, circumcision and “chira” have an extremely powerful hold on people. Getting people to change established cultural traditions and belief systems can be sensitive and needs to be approached broadly and with some caution, but can be done.

<sup>104</sup> Akwara P et al; 2003

<sup>105</sup> Mbori-Ngacha D et al, 1998

<sup>106</sup> Okello I et al; 2008

<sup>107</sup> Adipo D et al 2008

<sup>108</sup> Sex is almost sacred among the Luo and at each stage of the farming process, a man is required to have sex with his wife before cultivating his field, prior to moving to a new house, if a parent dies, and in other situations. Sex is thought to have protective powers and it is believed that if these rituals of sex are not followed a curse resulting in death of ‘chira’ would follow. (Cultural tradition fuels the spread of HIV/AIDS, Plusnews, 2005.

<http://www.plusnews.org/report.aspx?reportid=39201>

<sup>109</sup> It is worth considering other public health challenges that have been addressed successfully through focusing on community-level interventions, such as smoking cessation campaigns. Changes in social norms around smoking are strongly associated with decreases in the % of people who smoke.

### 3.5. Structural Level Factors Influencing Risk of Heterosexual HIV Transmission

Different authors have tried to quantify or characterise structural factors that may have an impact on HIV transmission. Besides the individual and societal level determinants of HIV, there is a third level of determinants that have been variously labelled “structural”<sup>110</sup> or “macro-social”<sup>111 112</sup> factors. These include:

- Violence and discrimination, legal structures, demographic change, the policy environment, and war and militarization.
- Macro-economic policy, health policy, social policy, and illicit drug control policy.
- Poverty, gender inequalities and global capitalism.
- Economic inequalities, racism, sexism, discrimination and stigmatization.

These disparate factors have in common that they cannot be controlled by individuals or communities of individuals, and only a few of them can be directly controlled by policy makers. However, there are many who argue that these all are distal determinants of HIV and need to be addressed, along with the various more proximate determinants of individual behaviour and community norms. For example, there are numerous reasons to believe that HIV risk can be reduced and the sexual empowerment of women and girls can be enhanced through educational and economic interventions, or reform of the current Kenyan inequities between men and women over inheritance rights, or the right to own land.<sup>113</sup>

However, there is little research or evaluation around structural interventions. It has been noted that “The number of published studies that describe and/or evaluate specific structural interventions in detail is restricted”<sup>114</sup> and “Although structural interventions are increasingly regarded to be important in the prevention of HIV infection, few have been rigorously assessed in developing countries”.<sup>115</sup>

### 3.6. Factors Influencing Other Modes of Transmission

#### 3.6.1 Transmission during sex between men having sex with men (MSM)

Within the past couple of years, the extent of the MSM issue in Kenya has begun to be revealed. Several recent studies<sup>116</sup> among Kenyan MSM have shown that community stigma and discrimination are widespread.<sup>117</sup> There is a high prevalence of risky sex involving multiple sexual partners, with 79% reporting having two or more partners in the past year. In another study of MSM, over 700 MSM were estimated to be selling sex in and around Mombasa.<sup>118</sup>

#### 3.6.2 Transmission from mother-to-child

Vertical transmission of HIV is not part of the incidence model, nor a mode of transmission that is dependent on the individual risk factors addressed in this report. In 2005 it was estimated that

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<sup>110</sup> Poundstone et al, op cit

<sup>111</sup> Campbell et al, op cit

<sup>112</sup> Sumartojo 2000.

<sup>113</sup> Blankenship et al. 2006 showed that economic independence and negotiating power are the strongest predictors of condom use.

<sup>114</sup> Parker et al. 2000.

<sup>115</sup> Pronyk et al. 2006.

<sup>116</sup> Onyango-Ouma, W. et al; 2005.

<sup>117</sup> Sharma A, Bukusi E, Gorbach P, et al. 2008

<sup>118</sup> Geibel S, et al., 2007.



there were 100,000 children in Kenya with HIV,<sup>119</sup> but by 2005, almost half of all maternal and child health facilities offered PMTCT services, and the MOH target was that 80% of health facilities would offer antenatal testing by 2007. The KAIS 2007 indicated that 9.6% of pregnant women in Kenya were HIV-positive with minimal differences between urban and rural residence, a 30% increase from the 7.3% reported in the KDHS 2003.

### **3.6.3 Transmission through needle sharing during injecting drug use**

Gouws et al in their modelling exercise cited earlier<sup>120</sup> estimated that 5% of the incident HIV infections in Kenya could be attributed to injection drug use, whereas the modelling in this exercise calculated a rate of 7% nationally, but with a 16% share of the incidence in Nairobi and 18% in Mombasa. A United Nations Office on Drugs and Crime survey in 2004<sup>121</sup> estimated that Kenya had 18,000 heroin users although fewer than 10% are likely to become injecting users.<sup>122</sup> In the absence of data, it is hard to calculate either the number or IDUs in Kenya, nor to estimate the number who may be HIV-positive.

### **3.6.4 Transmission through the use of unsafe (unclean) medical injections**

It is unlikely that there is much medical injection transmission these days, given the raised awareness (both amongst health professionals and the general public) of the importance of clean needles. Gouws et al in their modelling estimated that no more than 0.6% of transmission in Kenya could be attributed to unsafe injections.

So a recent paper asserting that a certain proportion of cases in Kenya may be due to unsafe injections is cause for concern.<sup>123</sup> The authors note that Kenyan women who received prophylactic tetanus toxoid injections during pregnancy were 1.89 times (95% CI 1.03 – 3.47) more likely to be HIV-positive than women who did not receive the injection. These results were controlled for a number of confounders, including urban and rural residence and a number of socioeconomic variables. The modelling done here has resulted in approximately 2% of infections ascribed to medical injections, significantly more than the Gouws et al estimate.

### **3.6.5 Transmission through the transfusion of HIV positive blood products**

Blood transfusions are estimated to contribute about 5-10% of HIV transmission worldwide. However, it is likely that the amount of transfusion-related transmission in Kenya is considerably less than this (both the Gouws et al modelling and the current exercise attributed only 0.2% of transmission to this route). A National Blood Transfusion policy was established in 2001 in Kenya, and six regional transfusion centres screen all donated blood for HIV, and also Hepatitis B, Hepatitis C, syphilis and malaria.

As a result of the general decline in overall prevalence, and stricter selection of donors, HIV prevalence in donated blood fell from 7% in the late 1990's to 1.3% at the time of the 2003 KDHS (the other rates in 2003 were Hepatitis B: 3.2%, Hepatitis C: 1% and syphilis: 0.5%).

<sup>119</sup> AIDS in Kenya: Trends, Interventions and Impact; National AIDS & STI Control Program (NASCOP) Ministry of Health; 7<sup>th</sup> Edition, 2005

<sup>120</sup> Gouws E et al 2006

<sup>121</sup> Ndeti DM. 2004.

<sup>122</sup> Deveau C, Levine B, Beckerleg S. 2006

<sup>123</sup> Deuchert E and Brody S; 2006

### 3.7. KYE Synthesis: A Summary

From both the epidemiological analysis and the modelling, it is clear that heterosexual transmission is the most prominent mode of transmission in all areas of Kenya, but that it takes place in several different situations, including casual and long-term partnerships and assorted degrees of transactional alliances. While the model cannot distinguish between concurrent and serial partnerships, it is likely that concurrent partnerships are to blame for the continued high incidence in the general population.

The model demonstrates that new cases are arising in those who engage in casual heterosexual sex, either with sex workers or others. The incidence amongst the steady partners of people who have multiple partnerships demonstrates that those who are engaging in casual heterosexual sex are putting all of their partners – casual, regular, occasional, steady, long-term etc. - at risk. A compounding factor is the general lack of knowledge of status – a significant factor in casual and more permanent relationships.

It is also clear that Kenya has a mixed epidemic, with respect to geography, modes of transmission, sex and age. HIV transmission in Nyanza, for example, is more generalized than in Eastern or North Eastern provinces. Moreover, transmission dynamics are mixed, with significant transmission within the general population, among couples, and between people in most-at-risk populations and the general population. As well, the KAIS 2007 has revealed an increasing prevalence in rural areas of the country, particularly in the Rift Valley.

**Table 10: National Incidence of HIV and % Incidence by Mode of Exposure for Kenya**

	NATIONAL%		NAIROBI %		COAST %		NYANZA %	
<b>Heterosexual sex within steady union/regular partnership</b>	<b>44.08</b>		<b>29.5</b>		<b>37.90</b>		<b>24.22</b>	
Steady Partner Heterosexual	12.28		7.9		12.30		16.56	
Partners of Casual Heterosexual Sex	28.32		24.5		20.05		20.21	
Partners of truck drivers	0.71		0.6		0.87		0.20	
Partners of "Other" clients	0.49		1.9		0.64		0.37	
Partners of migrant farm workers	0.38				0.72		0.78	
Female partners of MSM	1.15		1.6		2.01		0.30	
Partners of prison population	0.17		0.1		0.18		0.08	
Partners IDU	0.58		0.7		1.13			
<b>Casual heterosexual sex</b>	<b>20.28</b>		<b>23.0</b>	<b>23.0</b>	<b>14.95</b>	<b>14.95</b>	<b>23.07</b>	<b>23.07</b>
<b>Female Sex Workers and their Clients</b>	<b>14.05</b>		<b>14.7</b>		<b>18.22</b>		<b>30.51</b>	
Female Sex workers	6.57		9.7		11.01		14.10	
"Other" clients	2.54		1.8		1.05		8.35	
Long distance truck drivers	3.54		3.2		4.57		5.07	
Migrant farm workers	1.4				1.59		2.99	
<b>MSM</b>	<b>15.23</b>		<b>16.4</b>		<b>20.53</b>		<b>5.99</b>	
MSM	7.14		9.0		11.29		2.15	
Prison population MSM	8.09		7.4		9.24		3.84	
<b>Injecting Drug Use (IDU)</b>	<b>3.83</b>	<b>3.83</b>	<b>5.8</b>	<b>5.8</b>	<b>6.13</b>	<b>6.13</b>		
<b>Health Facility Related</b>	<b>2.52</b>		<b>2.7</b>		<b>2.27</b>		<b>1.93</b>	
Medical injections	2.21		2.3		2.00		1.67	
Blood transfusions	0.31		0.3		0.28		0.26	

Table 10 clearly illustrates the heterogeneity of the epidemic, with variations in the three provinces surveyed (columns 2-4) compared to the national data (column 1). Table 10 also highlights the significant role seemingly played by specific populations in certain localities, such as the MSM in Nairobi and Mombasa. However, it also demonstrates a similarity across the country in the risks of exposure faced by those engaged in “casual heterosexual sex” and their partners.

To summarise what is known:

- Significant declines in HIV prevalence have occurred over the past ten years, but the current national prevalence level masks wide variations in prevalence in different regions of the country.
- SWs and truck drivers who were the initial bridges of the epidemic still seem to be important contributors to the epidemic
- There is evidence that men having sex with men (MSM), especially in prisons and possibly injecting drug users (IDU) are most-at-risk populations that need to be recognised
- Sexual debut occurs mostly in the age group 15 to 19 years, with low condom use during first sex
- Male circumcision rates differ dramatically across Kenya, and a lack of male circumcision is strongly associated with higher HIV prevalence. It appears that lack of circumcision is a compounding factor adding its own component of risk on to risky sexual behaviours including lack of condom use.<sup>124</sup>
- Despite evidence of some behaviour change, Kenyans are still at risk as a result of a number of factors, including high rates of casual sex with low rates of condom use, high rates of sexual and physical violence, and high rates of transactional sex, which can result in riskier sexual practices.

The modelling done for this report has demonstrated **the predominant role of heterosexual sex in maintaining the transmission of HIV**, and also has highlighted certain communities who are contributing disproportionately to the continuing incidence. Some of these communities have been well-known for many years, but the model has also revealed new communities that may be major contributors.

What factors account for declining prevalence but continuing incidence? The significant reduction in prevalence from 10% in the late nineties to 7.4% in 2007 may be due to better estimates, or more deaths from AIDS than new infections. (Antiretroviral treatment of people with HIV may be a factor in reduced transmission; with expanded access to ARV too recent for the expected effect on prevalence to be evident in the data yet).

There may be behaviour changes that would decrease transmission: increased awareness leading to reductions in risky behaviour through increased condom use, delays in sexual debut, reductions in the number of sexual partners and possibly a reduction in the prevalence of other STIs. More sex workers are aware of the risks of HIV and are using condoms, although there seems to be a belief that once a client becomes a “regular”, his risk of being an HIV carrier somehow declines. As well, a significant proportion of people are using condoms in casual sexual encounters – not as many as one would hope, but it could be that a 20-40% rate of consistent condom usage with casual partners -- together with reductions in numbers of sexual partners -- is enough to change the rates of transmission within the multiple concurrent partner sexual networks in Kenya.

However the more than 88,000<sup>125</sup> new infections in 2006 in the model is evidence either that not all of the populations targeted by prevention programmes are being reached, or that the

<sup>124</sup> The KDHS showed that men on the Coast had higher rates of sexual activity than other areas (19% of men with multiple sex partners), but their higher rates of circumcision counteract this – KDHS table 12.9

<sup>125</sup> The UNGASS 2008 Country Report for Kenya (NACC) places the number of new infections at 55,000, but the modelling data seem to predict a higher number, although not as high as some other estimates

prevention programmes are not as effective as they need to be, or that the patterns of transmission may have changed over time and important groups are not being targeted/reached.

Despite the importance of transmission in other groups, young people, remain of particular concern, especially young women, who are at risk of HIV transmission either because of their lack of knowledge about HIV, their lack of negotiating skills, or the imbalanced power relationships in which they might find themselves with their male partner/s. In order to be effective in reducing new infections and reaching those most in need, prevention strategies need to be adapted to the changing patterns of HIV risk. To target those most in need, it is important to first understand the behaviours that put people at risk of infection.

Lest one conclude from this report that the majority of HIV incidence in Kenya is happening in Mombasa, Nairobi, and Nyanza, and that the bulk of future prevention efforts should be targeted there, in addition, the rising prevalence in the Rift Valley and Eastern Province demonstrated in the KAIS 2007 indicates that more work needs to be done there.

It also needs to be restated that while this modelling exercise has revealed a number of important factors contributing to HIV in Kenya, it has also revealed limitations of the modelling approach. Despite efforts to control for uneven data, the lack of validated data on several communities or regions combined with a great deal of data from other groups (for example, truck drivers or fishing communities) may create an imbalance in the modelling results that distorts the model's picture of the role that some groups play in HIV transmission in the country,

## CHAPTER 4. THE PREVENTION RESPONSE

In recent years, treatment has been emphasised in Kenya, overshadowing prevention. Despite the evidence that some prevention programmes seem to be working (based on evidence of increasing condom use, declining STIs, and a lower proportion of youth starting sex before age 15) their effectiveness may be limited both in geographic and target group reach, and there remains a need to collect more concrete evidence on which HIV prevention programmes have worked, and why. In some areas and in some communities, there remains a low coverage of prevention programmes with limited impact on national prevention efforts.<sup>126</sup>

There is growing recognition that scaling-up prevention strategies and interventions that have proven to be most effective may be the most cost-effective way to contain escalating treatment costs.<sup>127</sup> However, to do this requires careful analysis of the distribution of new infections, the modes of transmission and the groups at highest risk of becoming infected, as well as evaluations of interventions that work, in order to identify the most effective prevention programs and how to scale them up to prevent the most new infections.

In the following pages, the main areas of the prevention response in Kenya are summarised, and linked to the allocation of resources in the country.

### 4.1. National Policies for HIV Prevention

Despite an initial reluctance during the 1980's to acknowledge the gravity of the epidemic, Kenya now has political commitment to reverse the spread of HIV and AIDS. The National AIDS Control Council (NACC) was established in 2000 under the Office of the President to provide leadership and a stronger coordination mechanism for a new, multi-sectoral national response to HIV/AIDS. The NACC has a costed plan for effective HIV management, including HIV prevention, for the period 2005/6 – 2009/10 and coordinates all HIV and AIDS programmes, policies and interventions in the country, working and liaising with stakeholders from government, civil society, the private sector, external agencies and the corporate world.

In September 2003 the Kenyan government approved a bill that would make it a criminal offence to terminate or deny employment to anyone on the basis of his/her HIV status and would prevent insurers from raising premiums or denying services to HIV-positive clients. With the passing of the HIV/AIDS Prevention and Control Act in December 2006, Kenya now has a policy prohibiting HIV screening for general employment purposes, and ensuring that AIDS research protocols involving human subjects are reviewed and approved by a national or local ethical review committee. There has been some improvement in the policies, laws and regulations in place to promote and protect human rights, however, despite civil society being in agreement, the HIV/AIDS Prevention and Control Act has not yet been gazetted. The country has anti-discrimination laws and regulations that specify protection for vulnerable subpopulations, which include children, women and young people. Promotion and protection of human rights is explicitly mentioned in some HIV policies and strategies and there are also policies and laws against child marriage, sexual abuse and gender-based violence.

The country has a national policy for free (to users) HIV-prevention services, ART and HIV-related care and support interventions. VCT, ARVs and TB medication are given free of charge in government facilities. However, by and large, providing HIV services is donor sustained (see further discussion of this in Section 4.4).

<sup>126</sup> Pisani E, Garnett GP, Brown T, et al. 2003.

<sup>127</sup> NACC Joint HIV and AIDS Program Review 2007

Through the Joint Annual Performance Review (JAPR) process, the NACC conducts regular national annual reviews to monitor and evaluate the progress in implementing the national strategic plan, including whether current practices promote risk behaviour or hamper access to HIV prevention services.

As well, Kenya is working to realise the “Three Ones” principles for a comprehensive HIV response, namely:

- *One national strategy* – The Kenya National AIDS Strategic Plan 2005/6-2009/10, developed through a consultative process involving a large number of stakeholders.
- *One coordinating authority* - The JAPR 2007 reiterated that NACC’s role as national coordinator must be recognized and observed. A harmonization task force was created, drawn from development partners, including UNAIDS, civil society, key government ministries and NACC. In 2006 and 2007 NACC devolved the JAPR process to the districts so that Kenyans nationwide could articulate the needs, gaps and priority issues in their communities.
- *One national monitoring and evaluation (M&E) system* - NACC is the national coordinating authority for Kenya’s HIV and AIDS M&E framework. The M&E framework was revised in accordance with the JAPR recommendations of 2006. Monitoring of HIV prevalence is done through a sentinel surveillance system of 44 antenatal clinics (ANCs) under the National AIDS/STD Control Programme (NAS COP), situated in the Ministry of Health.<sup>128</sup>

Kenya has a policy or strategy that promotes information, education and communication on HIV to the general population. The key messages that are explicitly promoted include being sexually abstinent, delaying sexual debut, being faithful, using condoms consistently, engaging in safer sex and involving people with HIV to a greater extent in the national response. The government promotes increased knowledge of HIV status by vigorously promoting counselling and testing (CT).<sup>129</sup> Other policies it promotes include blood safety, personal hygiene and sanitation and improved methods of waste disposal. It should be noted that other important prevention strategies that have proven to be of value, namely partner reduction, reducing stigma against most-at-risk populations and male circumcision are not explicitly mentioned as strategies in the current KNASP (although promotion of circumcision, as noted, has recently been promulgated, but not yet enacted as an additional HIV prevention strategy).

The country has a policy or strategy that promotes HIV-related reproductive and sexual health education for young people and HIV education is part of the curriculum in primary schools, secondary schools and teacher training colleges. The country also has a policy or strategy to promote IEC and other preventive health information for vulnerable subpopulations such as women and youth (but does not certain high risk populations).

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<sup>128</sup> Recent surveys besides the annual surveillance include the Behavioural Surveillance Survey (BSS) in 2002 and the population based Demographic and Health Survey (KDHS) in 2003. The KDHS, for the first time, included HIV testing in the households and the results provided useful information on the robustness of the sentinel surveillance system. The country’s HIV prevalence and behavioural antecedents are in the process of being updated from the general population survey (the Kenya AIDS Indicator Survey - KAIS), the fieldwork for which was completed towards the end of 2007.

<sup>129</sup> Counselling and testing has not been proven as a successful prevention policy, but it is essential as a way to access care and treatment – particularly for discordant couples

## 4.2. KNASP Prevention Strategies – Review of Progress

The KNASP guidelines for prevention call for: a) scaling up access to counselling and testing (knowledge of HIV status); b) strengthening sexually transmitted infection (STI) and HIV programme linkages; c) sexual abstinence; e) delayed sexual debut; f) prevention of mother-to-child transmission; g) blood safety; h) injection safety; i) post-exposure prophylaxis (PEP); j) consistent condom use; k) targeted behaviour change communication (BCC); l) reduction in number of sex partners and m) ensuring that balanced prevention and treatment efforts are mutually supporting. In 2007 a policy statement to include circumcision as a strategy was developed, though the policy is yet to be implemented. The national consensus is that a full scale-up of prevention strategies should be a priority to reduce new infections and to contain the escalating costs resulting from an increasing number of cases seeking treatment.

### 4.2.1 Counselling and Testing

Over the past five years, there has been a significant increase in the number of people who have gone for counselling and testing (CT). The cumulative number of people tested through VCT and PMTCT together has grown from 1.7m in 2005 to more than 4.6 m at the close of 2007. The number of VCT sites (excluding PMTCT) increased from 3 in 2000 to almost 1,000 countrywide (960) in 2007.<sup>130</sup> The KNASP targets for 2010 of at least 2 million people tested annually -- 500,000 at VCT sites and 1.5 million in clinical testing including pregnant women -- is on course and likely to be attained.

Issues have been raised concerning the adequacy of VCT in catering to the changing profile of the epidemic. The distribution of sites is skewed; 60% of the sites are based in the urban and peri-urban areas where only 20-30% of the population live, while only 40% of the CT centres are in rural Kenya where 70-80% of the population reside. Mobile sites for remote rural areas are being promoted to cater for this imbalance.<sup>131</sup> Home-based testing, door-to-door and public events testing have been introduced as well but uptake through these approaches is still slow.<sup>132</sup>

Table 11 is a tabulation of VCT clients in 2007 by province. Some geographical disparities in coverage are immediately apparent when one compares the distribution of VCT (column three) with incidence in the provinces where modelling was done (column 5): Coast Province contributed approximately 8% of new cases but 15% of the VCT was done there. Similarly, Nairobi had 12% of the new cases but 18% of the VCT clients, while Nyanza which had 25% of the incidence had only 18% of the VCT clients.

**Table 11: Geographical coverage of VCT, 2007**

Province	VCT clients in 2007	% of all VCT	% coverage	% of total incidence (from model)
Central	63112	8.7%	1.4%	---
Coast	106520	14.8%	3.2%	8.1%
Eastern	61081	8.5%	1.1%	---
Nairobi	126921	17.6%	4.0%	11.6%
North Eastern	3455	0.5%	0.3%	----
Rift Valley	148879	20.7%	1.5%	----
Nyanza	130362	18.0%	2.3%	25%
Western	80643	11.1%	1.8%	----
<b>Totals</b>	<b>720973</b>	<b>1.1%</b>	<b>1.1%</b>	

Source: collated from NACC data

<sup>130</sup> Government of Kenya, AIDS in Kenya, Trends, Interventions and Impact, 7<sup>th</sup> Edition 2005, Ministry of Health

<sup>131</sup> NACC JAPR 2006, 2007

<sup>132</sup> NACC JAPR 2007



Despite the volume of resources allocated to it (see Section 4.4), no assessments have been undertaken in Kenya to ascertain the effectiveness of the counselling and testing programme. The effect of CT on behaviour change has not yet been established in studies of various populations and settings.

On the other hand, more people are being tested. The 2003 KDHS estimated that only 14% of the population had ever been tested. By the 2007 KAIS, this figure had risen to 36%, with a tripling of testing in women aged 15-49 (from 13% to 43%) and a doubling in men (from 14% to 25%).<sup>133</sup>

Prevention with Positives Programmes that aim to support HIV-infected persons and limit HIV transmission through behavioural and medical interventions have not been implemented widely in Kenya. Some research indicates that support to HIV positive persons to learn their own and their partners' status could increase access to care<sup>134</sup> and treatment<sup>135</sup> and reduce HIV transmission, although others point out that studies have shown no consistent reduction in risk for those testing HIV-negative, and testing programmes have produced no evidence of HIV reduction in populations.<sup>136</sup>

However, it remains true that people need to know their status for treatment purposes. Although there is no evidence that counselling and testing has an effect on prevention, it can also be appreciated that for a number of reasons, it is important that people know their status. The barriers to wider HIV counselling and testing may rest amongst the community norms and standards (including reasons for discrimination and stigma) described in section 3.2.

#### **4.2.2 Prevention of mother-to-child transmission (PMTCT)**

PMTCT services were introduced in Kenya on a pilot basis in 2000, and by December 2006, 64 percent of facilities were providing services to 60-70 percent of all pregnant women. Over 1,000 ANC sites now offer PMTCT and another 2,100 sites are planned. The KNASP target of introducing PMTCT in 80% of health facilities offering antenatal care by 2007 has been met.

Each year, almost 1.5 million women in Kenya are pregnant. In 2006, 42% (up from 28% in 2005) of this number were counselled and tested. About 57,800 pregnant women were HIV positive, but only 39% of these were treated with Nevirapine. During the first two quarters of 2007 the uptake of Nevirapine by HIV positive pregnant women was nearly 52%.<sup>137</sup>

However, only Nevirapine is provided to HIV positive pregnant women. It is expected that increased funding from PEPFAR will enable pregnant women who test positive also to be offered treatment if needed, with a target of 86,000 women (75% of all in need) accessing ARV.

Recent studies in Africa have demonstrated the efficacy for reducing infant HIV by providing anti-retroviral to mothers, not only at birth, but also for the first several months, during the period of exclusive or almost-exclusive breastfeeding,<sup>138 139</sup> but these programmes have not yet been adopted in Kenya.

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<sup>133</sup> KAIS 2007, *ibid*

<sup>134</sup> Mermin J et al; 2005

<sup>135</sup> Weidle PJ et al; 2002

<sup>136</sup> Potts M et al, 2008

<sup>137</sup> Govt. of Kenya. UNGASS report 2007

<sup>138</sup> Kilewo C et al; 2007.

<sup>139</sup> Kilewo C et al; 2005

Table 12 demonstrates the geographic variations in some key PMTCT indicators. Several questions arise from this table, including the reasons for the low uptake of ANC Nevirapine in Eastern and Rift Valley (column 4), and the low uptake of infant Nevirapine in Nairobi (column 7). Is this the result of service provision problems, cultural factors, or an artefact in the data? Clearly, more research is needed.

**Table 12: Geographic variations in key PMTCT indicators in 2006**

Province	CT uptake	ANC% HIV+	ANC NVP uptake	Maternity HIV+	Maternity NVP uptake	Infant NVP Uptake
Central	91%	4%	70%	6%	89%	78%
Coast	97%	5%	76%	18%	74%	37%
Eastern	87%	7%	38%	25%	44%	11%
Nairobi	87%	10%	73%	30%	96%	5%
North Eastern	84%	1%	81%	1%	89%	110%
Nyanza	86%	17%	74%	19%	72%	59%
Rift Valley	86%	8%	44%	12%	75%	48%
Western	75%	6%	51%	10%	104%	39%
<b>TOTAL</b>	<b>87%</b>	<b>8%</b>	<b>62%</b>	<b>17%</b>	<b>73%</b>	<b>39%</b>

**Source:** collated from NACC data

Most programmes providing care, support and treatment are directed to adults. A significant percentage of all new infections in Kenya are due to vertical transmission and, currently, only about 50 percent of ART sites provide paediatric treatment, and only about 14 percent of facilities offer comprehensive PMTCT. Provision of FP is one of the four prongs for the PMTCT program but is not widely provided in Kenya. Provision of paediatric care has lagged behind that of adults in respect to procurement of drugs, training of health workers, advocacy and communication campaigns, provision of testing facilities and provision of appropriate counselling service for parents and children.

In mid 2007, there were 12,000 children on ART. However, there are an undetermined number of children in Kenya who are HIV-positive and who are not on ARVs. Many of these children (who may now be adolescents or even young adults) do not know their HIV status, sometimes because they themselves are AIDS orphans who have never been told the reasons for their parents dying. There is a general lack of counselling, testing, treatment and prevention services aimed at youth, especially youth who are already HIV-positive.

#### **4.2.3 Blood safety**

In 2006, 80% of blood demand was met and 90% in 2007. The National Blood Transfusion Service has led the transition from a hospital-based transfusion system to a national one that is primarily donor-based. All blood units that test positive are discarded. A full 100% of blood units are screened for HIV.<sup>140</sup> All indications are that blood safety is an area where the Kenyan response has been fully adequate and is being maintained.

#### **4.2.4 Condom promotion**

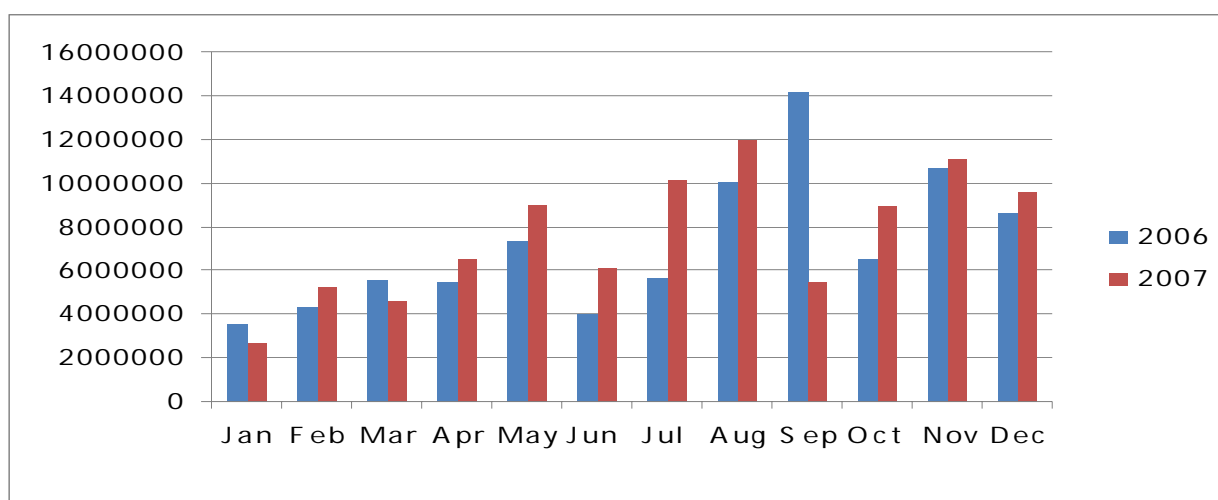
Free male condom distribution in Kenya increased significantly from 2000 to 2004 and thereafter declined steadily. The dramatic increase in condom distribution in 2004 was due to the introduction of the accelerated condom distribution programme, funded by the United States Government (USG) through PEPFAR, with funding to procure male condoms and to facilitate their distribution. Unfortunately, at the end of 2005, a gap in condom distribution emerged,

<sup>140</sup> Moore et al; 2001

mainly the results of American funds for condom distribution being cut<sup>141</sup> after a “negotiated distribution of labour whereby DFID and the GOK procures sufficient quantities of condoms and the USG covers associated condom social marketing / promotional costs”<sup>142</sup>.

It is often reported that on the average 120 million condoms are distributed annually with an estimated use of 10 million per month from 3 – 4 million per month before the accelerated programme. However, Figure 16 indicates that the actual number of condoms distributed per month in 2006 and 2007 was usually much lower – averaging around 7 million, and reaching 10 million or more in only 6 of the 24 months. Since the withdrawal of the USG, there has not been a steady source of condom procurement but they are sometimes supported by UNFPA, the World Bank, and Global Fund and DFID funds through PSI. None of the donors provide condom distribution funds and this presents a challenge to the government, which provides less than 5% of the total HIV and AIDS programme budget.

**Figure 16: Condom distribution in the country per month 2006 - 2007**



**Source:** Collated from NACC data 2008

The KNASP 2005/6–2009/10 target of 160 million condoms distributed in the country annually by 2010 may not be realized if disruptions in funding and procurement continue. The majority of provinces in 2007 reported that male condoms were consistently in short supply.<sup>143</sup> In addition, condom dispensers are placed in public areas such as chiefs’ camps, which discourages uptake by youth and at-risk groups.<sup>144</sup> Not much is known about the subsidized condom sales through social marketing, donor funded projects, and sales in the private sector. Table 13 is a summary of available data on condom distribution by province, both free and for sale.

As can be seen, based on a condoms/eligible person/year, condom distribution in the country is very low throughout and most unequal, ranging from almost negligible in North Eastern to 1.65 per person per year in Western Province. The three provinces with the highest prevalence are Coast (0.49), Nairobi (0.81) and Nyanza (1.06). What these data do not tell us are the reasons for the disparity: problems in the supply chain and distribution, varying demand, gaps in reporting, or a combination of all three?

<sup>142</sup> The American programme supports a comprehensive approach to HIV prevention, with a focus on abstinence and being faithful. It also promotes correct and consistent condom use – but does not explicitly promote partner reduction, which would more closely reflect the Kenyan realities..

<sup>143</sup> NACC 2007c, Report of the provincial/regional harmonization workshop

<sup>144</sup> NACC 2007a, Consultative meeting with wider civil society organizations

**Table 13: Condom distribution by province, both free and for sale**

Province	Number distributed	Number of persons eligible for condoms in province	Number of condoms/person/year
Central	1,530,744	2,875,759	0.53
Coast	947,920	1,934,796	0.49
Eastern	537,979	3,195,074	0.17
Nairobi	1,761,580	2,187,930	0.81
North Eastern	23,555	703,589	0.03
Nyanza	3,252,989	3,061,483	1.06
Rift Valley	3,328,217	5,246,340	0.63
Western	3,903,960	2,368,260	1.65
<b>National</b>	<b>15,286,944</b>	<b>21,573,231</b>	<b>0.71</b>

Source: collated from NACC data 2008

Female condoms are not available through the public sector, but they are available in the market. However, they are not popular, possibly because they are expensive, but also because there has been no social marketing strategy that utilises evidence-based data to push the message that they are safe and reliable and have many positive benefits for the female user. Uptake of female condoms is extremely low - 300,000 female condoms were distributed in 2005 but only 18,000 in 2006.<sup>145</sup> At the end of 2007, there were only 1,800 female condoms remaining in stock at KEMSA.

#### 4.2.5 Treatment of sexually transmitted infections (STIs)

There has been sentinel surveillance of patients with sexually transmitted infections (STIs) since 1990. HIV prevalence among STI patients has been declining almost without interruption since 2000. In 2006, 19.1% of STI patients were HIV positive compared with 21.5% in 2005. There was a decline in prevalence among all age groups in 2006 with the exception of the 35–44 age group, in which prevalence from 2002 to 2006 has risen from 25.6% to 29%. By comparison, prevalence in the 25–34 age groups declined from 30.4% to 21.7% over the same period. There has also been a drop in the prevalence of some STIs, which could be attributed to increased awareness of the link to HIV, free treatment (and subsequent increased service uptake) and greater condom use.<sup>146</sup> However, as noted earlier, the high prevalence of HSV-2 in the Kenyan population as revealed by the KAIS 2007 is a cause for concern.

#### 4.2.6 Communication for sexual behaviour change (BCC)

One of KNASP's core prevention principles is targeting interventions to the most vulnerable populations and including all Kenyans in a national response to the AIDS epidemic. But Meaningful engagement with all at-risk populations<sup>147</sup> has fallen short. No nationally-led preventive interventions programmes for MSM, FSWs and IDUs have been undertaken or are being rolled out anywhere in the country, other than some very small scale individual projects and organisations that have been working with SWs (in Mombasa, Nairobi and Kisumu) or MSM.

Kenya established a national BCC consortium in 2005 and is now forming regional BCC consortiums, initially in at least four provinces. BCC strategies for the most at risk groups are not yet developed. Thus, strategic communication on HIV and AIDS through cross cutting interventions and imbedded in the 2005/6 – 2009/10 KNAPS are not yet in place.

<sup>145</sup> NASCOP data - an explanation is needed for this rapid decrease

<sup>146</sup> Government of Kenya, Behavioural Surveillance Survey 2002, NASCOP

<sup>147</sup> A distinction needs to be made between "most at risk populations" (like sex workers who because of their individual behaviour are at higher risk for transmitting HIV) and "key populations that are vulnerable" (such as OVC) whose situation may lead them to engage in behaviours or subject them to behaviour that may expose them to HIV infection.

As well, many preventive efforts in Kenya have been primarily about developing communication programmes and interventions targeted to changing behaviours, especially those behaviours that most increase the risk of being infected with HIV. However, due to lack of consensus and understanding of what Behaviour Change Communication really is, these efforts have been of varied quality, few have been truly evidence-based, and some have not been assessed for their effectiveness and efficiency. They have also failed to address barriers that prevent people from accessing services.

Table 14 is an analysis of community outreach activities by province, again drawn from NACC data.

**Table 14: Community Outreach Activities by Province**

Province	Persons reached	Persons in province	Contacts per person in province per year
Central	4,316,167	3,400,991	1.3
Coast	909,847	2,274,033	0.4
Eastern	1,487,712	3,565,308	0.4
Nairobi	13,010,502	2,403,120	5.4
North Eastern	310,525	896,531	0.3
Nyanza	3,341,356	3,769,586	0.9
Rift Valley	3,746,777	6,376,932	0.6
Western	2,628,549	2,930,675	0.9
<b>National</b>	<b>29,751,435</b>	<b>25,617,176</b>	<b>1.2</b>

Source: collated from NACC data 2008

This demonstrates very starkly the disparities in the country in the delivery of programmes. The national average of 1.2 contacts per person per year is a distorted figure, due to the fact that Nairobi registers five times that amount, and Central Province is the only other region that exceeds the average, with Nyanza and Western province being a little below the average. Considering the incidence rates in Coast Province revealed by the modelling, it is distressing to note that the rate of community contacts there is barely greater than North Eastern Province, where the epidemic is minimal.

#### 4.2.7 Abstinence and Faithfulness

KNASP aims to reduce the number of young people, especially girls, having sex by age 15, and promotes abstinence and /or consistent practice of safe sex. Many believe that education is a preventive approach that can help ensure that school age children grow up free of HIV infection. The MoEST skills-based HIV/AIDS prevention education program was evaluated in 2000 schools and found effective at promoting healthy behaviours and reducing the risk of infection. This program is targeted for expansion over the first three years of the current KNASP.

The promotion of abstinence as a tenet of American policy has meant that many organizations in Kenya<sup>148</sup> have been funded by the USG (PEPFAR) to conduct interventions promoting abstinence and being faithful. However, **no evidence has yet** been produced measuring the extent to which abstinence programmes are effective at promoting behaviour change in Kenya<sup>149</sup> especially in groups who have already become sexually active to warrant high levels of resource allocation and expenditure. There is no record of any assessment being carried out to evaluate the impact of any agency's programmes.

<sup>148</sup> Many are not indigenous Kenyan organisations, but rather branches of international faith-based organisations

<sup>149</sup> There is evidence from Uganda that the "zero grazing" policy was highly effective in changing behaviour and reducing incidence, but whether it was the abstinence and partner reduction messages or other coincidental events that led to the behaviour change is an issue.

### 4.2.8 Injection Safety and Post-Exposure Prophylaxis (PEP)

Currently, PEP services are restricted to a few specialized health facilities in the country. The KNASP strategy aims to integrate PEP into ART services and provide PEP at all ART sites. The police will be trained on how best to handle rape and sexual violence survivors and the need to refer survivors to health facilities offering PEP within an appropriate period of time.

### 4.3. Interventions targeting specific most-at-risk populations

Table 15 is a list of population groups in Kenya identified in the present KNASP as being vulnerable to HIV. It should be noted that while most groups are mentioned in the KNASP (noted with a ✓); **most programmes directed at these groups are being carried out by CBOs and not by the government.** These activities don't need to be carried out by government, but they do need to be deliberately targeted by the Government or NACC strategies in order to “validate” the work being undertaken by civil society organisations. Based on what the modelling has shown, the most important high-risk groups that are NOT being covered include **MSM, IDUs, truck drivers, fishing communities, young women and girls and prisoners.**

**Table 15: Identified Risk and Vulnerable Groups and Prevention Strategies in KNASP**

TARGETED GROUPS	KNASP	STATUS
Discordant couples	✓ *	In NACC documents but weak implementation, no systematic messages – left to research pilot projects
Sex workers (SWs)	✓ *	In the NACC document but weak in implementation
Orphans and Vulnerable Children (OVC)		Not mentioned in the prevention strategy document – but only included in the mitigation programmes.
Migrant workers	✓ *	In NACC doc, but no NACC programme – a few CBOs working in this area.
Uniformed services	✓ *	- secret – anecdotally high HIV, but no public information
Survivors of Rape and Sexual Violence (Gender Based Violence)	✓ *	In NACC strategy, NACC providing training, little information on coverage etc.
<b>Other key populations</b>		
<i>Injecting Drug Users (IDUs)</i>	✓ *	In NACC strategy, no nationally-directed interventions.
<i>Men who have sex with men (MSM)</i>	✓ *	In NACC strategy no nationally-directed interventions.
<b>Focus on Gender</b>		
Mainstreaming gender	✓	Seems to be doing well, coverage not known
Young People	✓	Programmes delivered through schools – good for in- school but not for out-of-school youth.
People Living with HIV/AIDS (PLWHA)	✓ *	Not being addressed as PLWHA. Fit into the discordant couples group.
<b>GLIA:</b>		
Refugees and IDPs	* R	In NACC strategy but to be dealt with by GLIA
Truckers	* R	In NACC strategy but to be dealt with by GLIA
<b>Missing:</b>		
Fisher folk	?*R	Not in NACC strategy -some CBOs and NGOs working with fisher folk
Prisoners	?*R	Not in NACC strategy -some CBOs and NGOs working with prisoners

✓ mentioned in current KNASP; r = required; \* = currently with weak focus only by few CBOs; ? = not in KNASP

There are no specific efforts to target young women and girls, besides those for the overall group of “youth”. Besides the obvious point that issues of young men and young women regarding HIV and AIDS are different, there is also the fact that “youth”, as defined by NACC (and most international agencies), extends up to the age of 24. The vulnerability and issues facing girls below the age of 15 are light years different from those of a sexually active 23 year old, but the youth strategy in KNASP does not seem to acknowledge this.



Another gender issue that is not being addressed is the higher risk of HIV among widows, separated and divorced women<sup>150</sup> - this fact seems to cut across all ethnic groups. There is a need for more research to understand the causality – whether women are widowed, separated or divorced as a result of HIV (in themselves and/or their husband) or whether they become infected after losing or separating from their husband. There may be many reasons for this, ranging from traditional values (e.g. widow inheritance) to economic hardship and survival sex as a result of discriminatory inheritance practices.

#### 4.4. Resource allocations for HIV prevention

The analysis of total resources allocated to the HIV/AIDS response in Kenya by major donor and government sources during the 2005/06 and 2006/07 financial years<sup>151</sup> is presented in Table 16. During the financial year 2005/06, a total of KSh 11.5 billion (US\$ 162.4 million) was spent on HIV and AIDS interventions, an amount equivalent to about 0.8 percent of Gross Domestic Product (GDP) at current market prices.<sup>152</sup>

However, the next year - 2006/07 - expenditures on HIV and AIDS interventions from major sources more than doubled, totalling KSh 23.4 billion (US\$ 333.8 million) which was equivalent to 1.3% of GDP and about 85% of total MOH actual expenditures. This translated to KSh 17,971 or US\$ 256.73 per person living with HIV.

Table 16 also shows that in both 2005/06 and 2006/07, the bulk of HIV and AIDS expenditures came from international sources. In 2005/06, bilateral donors contributed the largest share, accounting for approximately 80.5% of the total expenditure, followed by the Global Fund (10.5%) and Government sources (5%). In 2006/07, the share of expenditure from bilateral sources increased to 93.7%, mainly because of rapid increase in financial resources from PEPFAR. As a result, the shares of other sources declined (expenditure from the Global Fund declined to 5% and that of Government to about 1.2%). It is clear that HIV/AIDS financing in the country rests largely with the donor community, contributing over 95% of HIV and AIDS expenditure. This high level of donor dependence raises a pertinent concern, whether expenditure outlays are sustainable given long term challenges.

**Table 16: Major Sources of HIV/AIDS Funding, 2005/6 and 2006/7**

Sources of Funding	2005/06		2006/07	
	US \$	KSh	US \$	KSh
<b>GOK</b>	8,197,066	581,171,990	3,855,463	270,267,985
<b>Bilateral</b>	130,655,104	9,263,446,873	312,780,267	21,925,896,686
<b>Multilateral</b>	372,132	26,384,144	366,962	25,724,056
<b>Global Fund</b>	17,029,931	1,207,422,135	16,551,122	1,160,233,681
<b>Others (international)</b>	6,100,000	432,490,000	200,000	14,020,000
<b>TOTAL</b>	162,354,233	11,510,915,142	333,753,815	23,396,142,408

Tables 17 and 18 present the **proportion of HIV/AIDS expenditures directed to prevention and treatment**. While these were equivalent in 2005/6 (37% and 39% respectively), in the following year, 2006/7 the treatment expenditure share was double that of prevention (46% compared to 24%) due to the fact that treatment expenditures in that year increased by over 140% while prevention expenditures increased by only 30%. Equally important would be to look at how the prevention funds are used, to assess whether there are gaps in resource allocation to the most-at-risk populations.

<sup>150</sup> KDHS 2003

<sup>151</sup> Accounts reported in financial years running from July 2005 to June 2006 and July 2006 to June 2007

<sup>152</sup> Equivalent to approximately 80 percent of total Ministry of Health expenditures (recurrent and development).



**Table 17: HIV/AIDS Expenditures (US\$) by Functions 2005/2006 and Source**

<b>FUNCTION</b>	<b>PUBLIC</b>	<b>DONORS</b>	<b>TOTAL</b>	<b>Percent</b>
Prevention	3,782,376	55,926,552	59,708,928	37%
Treatment	-	62,654,940	62,654,940	39%
OVC	16,188	3,569,544	3,585,732	2%
Program support	4,398,502	23,125,765	27,524,268	17%
Incentives – HR	-	2,487,925	2,487,925	2%
Other mitigation	-	332,201	332,201	0%
Community Dev.	-	4,460,239	4,460,239	3%
Research	-	1,600,000	1,600,000	1%
<b>TOTAL</b>	<b>8,197,066</b>	<b>154,157,166</b>	<b>162,354,232</b>	<b>100%</b>
<b>Percent</b>	<b>5%</b>	<b>95%</b>	<b>100%</b>	

**Table 18: HIV/AIDS Expenditure (US \$) by Functions 2006/2007 and Source**

<b>FUNCTION</b>	<b>PUBLIC</b>	<b>DONORS</b>	<b>TOTAL</b>	<b>Percent</b>
Prevention	3,207,875	75,526,961	78,734,836	24%
Treatment	---	152,092,438	152,092,438	46%
OVC	--	21,025,718	21,025,718	6%
Program support	647,588	56,832,618	57,480,206	17%
Incentives – HR	-	2,116,484	2,116,484	1%
Other mitigation	-	170,959	170,959	0.1%
Community Dev.	-	4,794,609	4,794,609	1%
Research	-	17,338,565	17,338,565	5%
<b>TOTAL</b>	<b>3,855,463</b>	<b>329,898,352</b>	<b>333,753,815</b>	<b>100%</b>
<b>Percent</b>	<b>1%</b>	<b>99%</b>	<b>100%</b>	

#### 4.5. Implementation of HIV Prevention Programmes

Most organisations that implement HIV prevention programmes are civil society organisations followed by organisations from the public sector. There are over 16,000 HIV & AIDS organisations listed in the NACC data base,<sup>153</sup> but only about 6,000 of these actually report to NACC, and of these, about 3,000 were analysed for this study. Most activities implemented in Kenya focused on “Interventions affecting knowledge, attitudes and beliefs and (seeking to) influence psychological and social risk correlates”.<sup>154</sup>

Table 19 shows HIV/AIDS Expenditures in USD by specific prevention interventions in 2006/07. It needs to be noted that:

- Most prevention programmes focused either on youth or on the general population. Very few programmes focused on adults 25 and older as a specific target audience.
- Also, most programmes focused on both men and women as a combined audience, and did not develop gender-specific messages or have programmes focusing on only men or only women.
- Most programmes seem to have a national reach and few programmes focused on one region only.
- Most messages focus on the ABCs of safe sex practices, but there were also messages relating to the promotion of STI treatment and male circumcision
- 18% of the budget is allocated for “other” activities that are not defined.

**Table 19: Expenditures by prevention interventional category for 2006-2007**

<sup>153</sup> And even this huge number represents only a small percentage of the organisations in the country working in the areas of HIV and AIDS

<sup>154</sup> Axis 1 of the six axes of prevention interventions defined by UNAIDS

<b>Prevention Interventions</b>	<b>Total Expenditure</b>	<b>Percent</b>
Voluntary Counselling & Testing	53,188,307	38.9
PMTCT	22,692,749	16.6
Workplace Activities	8,626,299	6.3
Condom distribution	7,768,504	5.7
Communication for social behavioural change	7,666,367	5.6
Safe Medical Injections	6,048,570	4.4
Prevention -- youth-out-of school	5,720,144	4.2
Prevention of activities not elsewhere classified	25,080,849	18.3
<b>Total</b>	<b>136,791,789</b>	<b>100</b>

Almost two-thirds of the prevention expenditures in 2006/2007 were on counselling and testing (38.9%), PMTCT (16.6%) and condom provision (5.7%), with minimal amounts spent on groups at risk, not just marginalised groups such as sex workers, IDUs, or MSM, but also groups such as youth or PLHIV who have been identified in the KNASP as target groups. Although it appears in the KNASP, treatment of STIs also is not recorded nationally as a prevention intervention.

However, several sectors' expenditures on HIV and AIDS were not captured in the calculations, including those of the Office of the President, other public agencies and the private sector. Some of the expenditure data were not disaggregated by categories and data were not classified by targeted population or interventions, as a National AIDS Spending Assessment (NASA) process had not been undertaken. Not all expenditure could be tracked; no costing was provided for STI, universal precautions, sex workers and people living with HIV, for instance.

#### **4.6. KYR Synthesis: Summary**

Most districts in Kenya are covered with programmes of blood safety, universal precautions in health care settings, PMTCT, IEC on risk reduction, IEC on stigma and discrimination reduction, condom promotion, HIV testing and counselling, reproductive health services (including antenatal, delivery and postnatal care, STI treatment, and family planning) and school-based education.

Programmes for specific vulnerable or at-risk populations (sex workers, fishing communities or certain migrant labour groups) are being carried out at specific sites, either by NGOs or by research groups from Kenyan or international institutions, but these programmes have limited coverage and are not being allocated funds by the central government.

Programmes not implemented in most districts include harm reduction for IDUs, risk reduction for MSM, risk reduction for sex workers, HIV reduction in the workplace, post-rape care, male circumcision and programmes for other specific communities with high prevalence and risk identified in this report, such as the fishing communities, truck drivers, etc.

Due to the slow acceptance and low adherence to the "Three Ones", not all the programmes operating in the country are reporting their activities to NACC,<sup>155</sup> which makes it difficult for NACC's M&E to estimate coverage of various programmes.

What is also clear is that not all prioritized HIV prevention areas are backed by empirical evidence; research is needed to inject evidence-informed prioritization. There is need for research to assess the impact of identified strategies; research findings need to be disseminated in clear simple language to implementers and the research fraternity has to play a role in policy

<sup>155</sup> Of some 16,000 NGOs registered in the AIDS field in Kenya, perhaps one-third report to NACC, and about half of these were analysed for this study.

formulation. At some point, a method needs to be found to enumerate, evaluate and monitor the organisations working on HIV and AIDS in the country. In summary:

KNASP Strategies for Prevention of New Infections	STATUS
1. Counselling and testing	<ul style="list-style-type: none"> <li>- NASCOP with support from USG has steadily scaled up VCT services</li> <li>- 60% of VCT sites are in urban centres where only 20-30% of population live.</li> <li>- <b>Only 24-26% know their status</b></li> <li>- No national efforts relating to positive prevention</li> </ul>
2. Condoms	<ul style="list-style-type: none"> <li>- MOH distributes condoms through their facilities, PEPFAR through (PSI) social marketing; GTZ social marketing of condoms, Private sector outlets for condoms</li> <li>- An average of just over 7 million per month were distributed in 2006 and 2007, with <b>big fluctuations due to problems in supply and distribution</b>. KEMSA can only distribute to provincial level and there are problems at the provincial/district distribution</li> <li>- With the drop in USG funding for condoms as a result of agreement on distribution of labour among donors and government, question is “where is the money coming from?” No money for distribution of condoms – availability and accessibility has suffered.</li> </ul>
3. STIs	<ul style="list-style-type: none"> <li>- Comprehensive national programme institutionalized within the MOH</li> <li>- incidence/prevalence seem to be declining – why? – Use of condoms by SWs? Behaviour change?</li> <li>- <b>Very little is known about the status of STIs at the moment.</b></li> </ul>
4. PMTCT	<ul style="list-style-type: none"> <li>- on paper is progressing well – implemented in 1,000 facilities</li> <li>- USG/PEPFAR main support to MOH; GTZ also provides some support</li> <li>- Also support from UNICEF and WHO</li> <li>- <b>still not universal access</b></li> <li>- Programmes have not been evaluated</li> </ul>
5. BCC	<ul style="list-style-type: none"> <li>- PEPFAR through PSI, Engender-Health, FHI, PATH, etc. have campaigns geared to general populations</li> <li>- DFID through HAPAC supporting innovative work with FM radio targeting youth in Nyanza</li> <li>- UNICEF and UNFPA also involved.</li> <li>- NACC was to write specific strategies for key populations that are vulnerable – Youth is the only one that’s been done, and it is actually being run by NACC itself, not decentralised.</li> <li>- Little information available on what is being done and who is doing it (JAPR documents do not contain this information)</li> <li>- Some local programmes for fisher folk, sex workers, Matatu drivers, truck drivers, etc</li> </ul>
6. Abstinence and Faithfulness	<ul style="list-style-type: none"> <li>- Youth focussed interventions; programme to address HIV in the education sector to reach in school youth</li> <li>- USG through PEPFAR promotes abstinence and faithfulness with special emphasis of reaching 1 million youth, DFID has a life skills programme in schools</li> <li>- small grants and foundations to reach youth through RH/FP programmes</li> <li>- <b>The only area that has lots of CBOs and faith-based organisations funding it. – impact of these programs not known</b></li> </ul>
7. Safe Blood	<ul style="list-style-type: none"> <li>- USG/CDC supports MOH in improved blood collection and testing services in Kenya</li> <li>- more than 90% of blood is safe</li> </ul>
8. Injection Safety and PEP	<ul style="list-style-type: none"> <li>- USG/CDC improved blood collection and testing services in Kenya</li> <li>- PEP available in ART sites supported mainly through USG/PEPFAR</li> <li>- PEP happening at each VCT centre. Do not know intensity, coverage or training</li> <li>- Very little information on injections safety – hard to get baselines.</li> </ul>
9. Balanced Prevention & Treatment	<ul style="list-style-type: none"> <li>- Concentrating on treatment may reduce funds or attention/effort (assuming capacity constraints) available for prevention</li> </ul>

As has been noted, **the distribution of services** (such as VCT) **does not align with the reported prevalence of HIV and incidence estimates from the model**. There is both geographical imbalance, and a deficit of services targeted to the most-at-risk populations.

The study encountered difficulties in estimating the resource allocations for prevention, because the NASA has not yet been implemented. Despite the difficulty in accessing much of the needed information, it is nonetheless apparent that:

- Although the absolute amount has increased, the share of total funding allocated for prevention activities has fallen in the past few years to less than 25% of the total HIV & AIDS funding in the country

- Approximately half of the prevention resources are used for counselling and testing and prevention of mother-to-child transmission, neither of which can be clearly seen to be having a direct link to prevention of HIV transmission in the main groups at risk or the general population.
- Youth-oriented programmes claim less than 5% of prevention resources
- While there are funds (8% of total) for BCC, funding aimed at well-known most-at-risk groups such as sex workers and their clients, MSM or IDUs are negligible or non-existent
- There is hardly any funding aimed at mobilizing communities.
- 18% of budget goes to “other prevention” activities (table 18), which are undefined and may or may not be proven-effective activities.

Therefore, while it is not possible at present to tie prevention activities to the resource allocation with accuracy, it does nevertheless appear that the majority of prevention resources are being directed to a handful of strategies in the KNASP, at least three of which (counselling, PMTCT, abstinence) have not been demonstrated to have a significant impact in reducing the transmission of HIV in the adult sexually-active population.

## CHAPTER 5. LINKING THE RESPONSE TO THE EPIDEMIC

The preceding pages should have demonstrated that the hypothesis with which this study began has been found to be a largely accurate representation of the situation in Kenya:

- Most transmission occurs through heterosexual sex, within discordant couples and as a result of multiple sexual partnerships -- both casual encounters and overlapping long-term relationships.
- Certain communities and groups engage in more casual sex; many of these relationships are transactional, and involve not only sex workers, but other women who engage in sex for transactional purposes but would not consider themselves to be sex workers.
- Steady partners of people who have multiple sex partners are at risk of contracting HIV from their steady partners.
- The epidemic is heterogeneous, with certain regions and communities displaying a higher prevalence that may be associated with a number of factors, including lack of male circumcision, low/selective rate of condom use, lack of knowledge of self-status and sexual partner status

An unexpected finding is that MSM seem to be involved in a significant proportion of new infections (with less evidence for the role of IDUs). That MSM may engage in some of the riskiest behaviours for HIV acquisition (unprotected anal sex) means that their incidence rate can be very high. The lack of targeted programmes (outside of the NGO sector) for this group is amongst the largest gaps in Kenya prevention programme. Partners of MSM and IDUs, and the partners of other risk groups such as truck drivers are also a neglected vulnerable population.

### 5.1. Do HIV prevention policies and programmes respond to the key drivers of the epidemic?

HIV prevention programmes in Kenya represent a typical mix of biological programmes (VCT, PMTCT, male and female condom distribution, STI treatment) and individual behaviour change programmes (BCC, youth programmes and IEC). The overall impression from the prevention analysis is that the biological interventions seem to be performing better than the advocacy programmes. This may be because of problems in implementation, or because it takes more time to develop behavioural programmes, and for behaviours to change. That programmes have not been equally monitored makes it difficult to make comparisons.

The KYE synthesis has made it clear that Kenya has a heterogeneous HIV epidemic - a mixed epidemic - with a range of epidemic risk factors and transmission modes that in many cases act synergistically:

- a) having casual sex with multiple partners
- b) having a steady partner who is part of another sexual network
- c) being in specific occupational groups (fisher folk, truck drivers and the communities they interact with)
- d) men not being circumcised
- e) being an MSM

As well, there are geographic variations that are tied to some of the above factors. There is more HIV in the three large urban centres, in Nyanza Province, and more recently in the Rift Valley, but more sophisticated analysis would be needed to know whether this is because some or all of the above risk factors happen to be more present in those locations.

Therefore, the HIV prevention response priorities will need to vary in the different areas of Kenya in two aspects: (a) varied spending priorities (on prevention vs. treatment vs. impact mitigation) and (b) varied priorities for target audiences, messaging and geographic areas reached. Specific hot spots appear to be Homa Bay (21%), Suba Bay (21%), Mombasa (11.7%), Nairobi (10.7%) and Kisumu (10.8%).

From the KYE synthesis and the KYR synthesis, it is clear that whereas Kenya has a mixed epidemic, the HIV response has been mainly driven from a national level, with general and overarching programmes that have not focused on the needs of specific most-at-risk populations (with specific messages and specific approaches). These most-at-risk populations include persons in specific mobile occupations – such as fisher folk, truck drivers and sex workers.

Messaging has also been general, and not focused on the unique factors that may give rise to rising incidence in specific sub populations.

NOTE: No data were available on the provision of HIV prevention services in specific provinces or for specific target audiences. This has left the impression that most HIV prevention programmes are driven nationally, with a strong concept of a nationally-approved and uniform campaign for all provinces, but this information needs to be verified.

## **5.2. Are KNASP HIV prevention policies based on the latest available evidence and global best practice?**

The KNASP strategies regarding condom provision, promotion of counselling and testing, PMTCT, blood safety and treatment of STIs all conform to international best practice. Delivery of the services under each of these initiatives may not be optimal, but in principle, these areas are being addressed according to the latest international standards.

The new evidence about male circumcision was released after the current KNASP was enacted, but there have already been initiatives to include promotion of male circumcision as one of the KNASP strategies.

Where the KNASP strategies and prevention policies do not fit with the epidemiological evidence is in the areas of sexual behaviour and the messages being promoted for behaviour change. The evidence indicates that heterosexual transmission is the primary mode of HIV transmission, and that this occurs not just in transactions with sex workers or among certain most-at-risk populations, but amongst a wide swath of the population, involving all age groups, who engage in multiple concurrent partnerships, both casual and long-term. Risk within stable couples, especially in discordant couples, is not being adequately addressed.

KNASP strategies seem to be directed either toward safe sex interventions aimed at the “most-at-risk” populations like sex workers or truck drivers, or abstinence and faithfulness interventions targeted at youth. There do not seem to be many programmes aimed at that vast middle ground of the population who are sexually active, and who are at risk because of the possibility that they or their partner have other sexual contacts. Condom promotion is not optimal, and there seems to be difficulties in promoting condoms (which do work if used consistently and correctly) to youth at the same time as promoting abstinence. And promotion of the female condom does not appear anywhere as a strategy.

Prevention for positives is another programme that, while not proven to be effective in changing incidence rates, is intuitively seen as an activity that could create benefits, and while it is a feature of the KNASP strategy, continued stigma in many areas of the country continue to

militate against its widespread uptake. Improved facilities for counselling and testing, especially of couples and people in discordant partnerships, is a necessary first step.

Finally, it needs to be noted that while the KNASP strategy calls for increased activities targeting vulnerable and most-at-risk groups such as SWs, MSM, truck drivers, etc. these programmes by and large are being carried out by civil society and the NGO sector, and have not been officially taken on by the public sector health or education systems. The government may not be well placed to undertake these programmes, but it should be the government's role to ensure that they are done well, and to scale, making sure that there is adequate funding, proper emphasis and appropriate evaluation.

### **5.3. Is funding for HIV prevention allocated to where it is most needed?**

Funding for HIV prevention programmes is primarily concentrated on VCT services, PMTCT and condom distribution. Although there are clear intentions (reflected in policies) and some evidence of other HIV prevention strategies being implemented, the bulk of funding (and therefore the bulk of the focus) is concentrated in these activities. It is clear from the programme data that scaling up of PMTCT programmes, provision of condoms, and VCT roll-out are national priorities. However, VCT programmes have not been proved by any research – on a population level – to contribute to reductions in either HIV prevalence or incidence. In fact, the only RCT on VCT methods showed a negative behavioural outcome for persons who test HIV negative using the rapid test method (compared to the older ELISA test for which one had to wait a week to obtain the results.)<sup>156</sup>

Resources appear to be allocated on the basis of equal distribution and “national equity” rather than on the basis of need, burden of disease, population distribution, etc.

Unfortunately, data on spending per type of beneficiary, and on spending patterns in specific geographic areas were not available. Therefore, it was not possible to draw conclusions about HIV prevention spending at provincial level or on programmes for specific target audiences.

### **5.4. Are there shortcomings in M&E for HIV prevention programming?**

What was clear from the review is that data are not yet available at the decentralised levels in a routine and systematic way. It was, for example, not possible to analyse HIV prevention programme and financial data at provincial level to enable transmission modes to be compared against the HIV response and the HIV funding available at the decentralised levels. Given the mixed nature of the epidemic in different populations and different regions in Kenya, decentralised data are essential to target and focus the HIV prevention response into the future.

There are also not sufficient data available on the effectiveness of individual HIV prevention programmes and efforts – either on a local level or a national population level.

Finally, no data about the quality of service provision were available. In the future, Kenya will have to spend more time and effort analysing and assessing the quality of services provided – providing a bad service (particularly in the sensitive areas of sexual behaviour) may be worse than not providing a service at all.

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<sup>156</sup> Corbett et al., 2007



## CHAPTER 6. RECOMMENDATIONS

These recommendations focus on what Kenya should do differently (more of or less of) in relation to its current HIV prevention strategies and prioritisation of allocation of resources.

### 6.1. Policy-level recommendations

1. The study found that MSM (including men in prisons), fishing communities, and clients of sex workers are more significant contributors to HIV incidence in Kenya than had previously been suspected. Therefore, a review of the KNASP to focus prevention strategies towards most at-risk populations is an urgent priority.
2. Consider the development of robust, flexible and relevant national and sub-national response strategies and plans that allow for maximum implementation of interventions and increased accountability among implementers and co-ordination mechanisms.
3. The study also found that the epidemic is heterogeneous, with great variations across regions and across risk groups within these regions. Therefore, well-designed and coordinated research to both understand and monitor these variations is required.
  - As policy at sub-national level is not adequately informed by evidence and day-to-day operations are challenged, NACC should conduct regular population-based surveys on a regional basis and analyse data at district level, to better identify the specific areas where prevalence, risk, and new infections are particularly high.
  - As the epidemic varies geographically, a policy of decentralised planning, implementation, coordination and M&E is needed to ensure that the HIV response in the various provinces in Kenya responds to the particular transmission modes of the epidemic in each province.
4. Lack of male circumcision has been confirmed as one of the primary compounding factors associated with higher risk HIV transmission. Therefore, the national circumcision policy needs to be rolled out with a better understanding of the cultural settings and issues as well as challenges faced by the communities in accepting MC.
5. In order to facilitate access and uptake of prevention and care services by MSM, IDUs, other drug users, sex workers, prison populations and other most-at-risk populations, it is recommended that in the immediate and short-term, ways be examined that will improve and hasten provision of services; in the long-term, discuss changing policies and laws that criminalise and discriminate against these groups.
6. In order to facilitate access and uptake of prevention and care services, means to address issues of decriminalisation and registration of sex workers need to be considered. It is recommended that the priority areas for this to begin should include fishing communities and along the major trucking routes.<sup>157</sup>
7. Given the lack of data in Kenya on HIV prevalence within the uniformed services, and the evidence from other countries showing that this may be a most-at-risk group, NACC should find a strategy for collaboration with these groups so that prevalence can be monitored, programmes implemented etc.

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<sup>157</sup> Successful prevention campaigns in Senegal, Thailand and elsewhere in SW communities have been achieved because of registration and monitoring mechanisms being put in place to increase SW's visibility and accessibility

## 6.2. Recommendations about the implementation of HIV prevention programmes

8. Given that casual heterosexual sex is the greatest contributor to HIV incidence; it is recommended that there is need to strengthen HIV prevention activities in the general population, prioritising male circumcision, partner reduction, condom use and deferred sexual inception. All HIV prevention interventions need to be designed with an awareness and sensitivity to community cultural values and norms but with clear and compelling messages.
9. Given its proven protective effect, male circumcision services should be rolled out and offered at the village level. NACC should work closely with NGOs and CBOs to mobilise and educate communities to accept this intervention and to understand that it does not provide 100% protection.
10. In view of the heterogeneous distribution of the HIV epidemic, it is recommended that prevention programmes for specific most-at-risk populations be prioritised and targeted to those regions and groups which are most vulnerable and exhibit increased risk, including prevention programmes for HIV positive persons.
11. Given the well-known association with individual HIV acquisition and transmission, STI diagnosis and treatment programmes need to be strengthened and expanded, especially among the most-at-risk communities.
12. Given the lack of programming, and evidence that 10% of all couples are discordant, it is recommended that NACC initiate special programmes targeting discordant couples, covering diagnostic, counselling and other health services (including family planning).
13. The so-called “steady partner heterosexual” category was a major contributor to HIV incidence. It is recommended that couple-based HIV prevention programs be intensified by expanding and enhancing the quality of couple-based voluntary counselling and testing. Programmes for married couples need to be designed and implemented nationally, even in provinces where there is a low prevalence of most-at-risk populations.
14. Despite the epidemic being generalised, certain most-at-risk populations, such as sex workers and clients, truck drivers, fisher folk, MSM and prison populations, and possibly IDUs continue to contribute an important percentage of new infections. Therefore it is important to scale up, revitalize and initiate programs among these populations through peer outreach, condom promotion and distribution, tailored sexual health care and community empowerment.
15. There are few data on the size, extent and behavioural characteristics of the Kenyan IDU population. There is a need for a national mapping survey. Given the extremely high incidence in this population, programmes should be urgently implemented, that should include counselling and testing and positive prevention for people with HIV, health care, rehabilitation and access to safe needles.
16. Although PMTCT has been rolled out, there are still limitations to universal access. There is need to widen coverage and increase availability, to provide a scaled-up and improved quality of service that includes an integrated package of family planning, sexual and reproductive health, maternal and child health services.

### 6.3. Recommendations on capacity building relating to HIV prevention

17. Because of the heterogeneity of the epidemic, programmes should be designed and implemented at the provincial and district level. This will require strengthening capacity to design and implement prevention programmes, which could be accomplished through establishing strengthening DHMTs and increasing linkages with NACC at the district level.
18. Programme planners at the provincial and district level need to be able to interpret and use research and surveillance data, and it is recommended that a national capacity building programme for HIV implementers and provincial level HIV planners should be designed and implemented: to help them interpret research data, use research data and conduct research to better understand the epidemic at their local levels and implement programmes that will really work.

### 6.4. Recommendations for additional monitoring and evaluation efforts

19. In general, financial data collection in Kenya needs to improve to enable assessment of programme implementation relative to allocation of funds and expenditure at the geographic level and for specific target audiences.
20. NACC should assist in improving access to research results, and interpreting research results into understandable knowledge that most implementers can interpret and use in planning, management and monitoring: An HIV-This-Month type publication written in a clear and simple way at a more fundamental level is recommended for all implementers of HIV services.<sup>158</sup>
21. The difficulty in accessing some data for this study emphasised that data about ‘what works’ and ‘how to implement better’ programmes for specific most-at-risk populations, size estimations, and recent research findings should be continuously collected. It is recommended that a Documentation Centre should be established in NACC for this purpose. As the lead agency, NACC should be regularly analysing and evaluating VCT, PMTCT and other national programme data as a way of informing recommendations for scale up and programme improvements.
22. Some areas where more research is needed:
  - sexual behaviour in specific communities, e.g. fishing communities
  - behavioural research around multiple concurrent partnerships
  - formative research to understand size, location, behavioural and demographic features of the MSM and IDU communities
  - factors explaining the high prevalence among widows/separated/divorced women
  - utilisation of services by geography and client population
  - social anthropological research into cultural issues requiring behaviour change.

### 6.5. Recommendations about funding for HIV prevention programmes

23. Funding percentages for treatment and prevention need to be balanced and return to the 2005/06 levels – where equal percentages of funding were dedicated to prevention and

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<sup>158</sup> There is already some headway in the region – Kenya is involved in three regional HIV interventions – EAC, GLIA and IRAPP – all of which focus on M&E and research coordination to improve the HIV responses in the region. There is also a regional institute – REACH – based in Kenya that focuses specifically on ‘translating’ research results into policy language

treatment. That said, different funding priorities for the different areas – linked to prevalence levels – are needed: (a) Areas with highest prevalence should receive balanced funding on prevention and treatment, whereas (b) areas with lower prevalence should receive more funding on HIV prevention than for treatment.

24. Funding for CT programmes should require enhanced couple-based testing and counselling, and create incentives for this to be encouraged – for service providers and for clients.
25. There is a need to increase spending on MC programmes, on programmes for specific most-at-risk populations, programmes to change social norms in the community and on prevention programmes that target HIV positive persons.

### **6.6. Recommended target audiences**

Focus on:

- Programmes for rural males and females – of all ages – in high prevalence districts
- Programmes for older urban adults
- Programmes for youth – delayed onset and behaviour
- Specific programmes for girls and young women – negotiating skills, empowerment
- Specific occupational groups – fishermen, sex workers, and truck drivers
- Married couples
- Persons with specific higher risk behaviour - MSM and men in prisons

### **6.7. Geographic areas for coverage:**

Specific hot spots to focus on:

- Nyanza, Nairobi, Western, Rift Valley and Coastal provinces – specific most-at-risk populations and communities
- Along all the major trucking routes.

## Annex 1: References

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**Annex 2: Study Participants**

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