The HIV epidemic in Tanzania Mainland:

Where have we come from, where is it going, and how are we responding?

'Sehemu tulipokuwa, tunaelekea wapi, na tunachofanya ni nini?'

FINAL DRAFT – not for sharing or for circulation
27 Oct 2008

Report prepared by ASAP, a service of UNAIDS, requested by UNAIDS Country Office and Tanzania Commission for AIDS
# Table of Contents

1. **INTRODUCTION** ........................................................................................................................................3

2. **METHODOLOGY** ......................................................................................................................................3

3. **THE HIV EPIDEMIC IN TANZANIA: ‘WHERE HAVE WE COME FROM AND WHERE IS IT GOING?’........4

   3.1 **HIV PREVALENCE TRENDS OVER TIME** ................................................................................................4

   3.2 **HETEROGENEITY IN HIV PREVALENCE** ................................................................................................6

      (a) Heterogeneity amongst men, women and in different age groups...................................................6

      (b) Heterogeneity across education levels .............................................................................................8

      (c) Heterogeneity across relative levels of wealth ..............................................................................9

      (d) Heterogeneity relating to marital status .........................................................................................10

      (e) Geographic heterogeneity: Residence ........................................................................................... 10

      (f) Geographic heterogeneity: Administrative regions ........................................................................ 11

      (g) Heterogeneity related to migration ............................................................................................ 16

      (h) Heterogeneity in specific sub-populations .................................................................................... 16

   3.3 **HIV INCIDENCE TRENDS OVER TIME** ............................................................................................ 16

4. **RISK FACTORS AND DRIVERS THAT HAVE IMPACTED ON TRENDS IN THE HIV EPIDEMIC IN TANZANIA** ................................................................................................................. 19

   4.1 **RISK FACTORS AT THE INDIVIDUAL LEVEL** ................................................................................. 19

      (a) Exposure to HIV ............................................................................................................................... 19

      (b) Per act probability of transmission ............................................................................................... 23

   4.2 **HOUSEHOLD, COMMUNITY AND SOCIETY LEVEL DRIVERS THAT COULD HAVE AFFECTED HIV TRANSMISSION** ................................................................. 24

5. **SUMMARY: TRENDS IN THE HIV EPIDEMIC AND RISK FACTORS IN TANZANIA** ............................... 25

6. **HOW HAVE WE BEEN RESPONDING? RECOMMENDATIONS FOR THE JOINT REVIEW** ....................... 26
List of Figures

Figure 1: Projected Nat HIV prevalence in Tanzania, 1980 to 2010 ................................................................. 4
Figure 2: Reported AIDS cases in Tanzania, 1983 to 2005 ........................................................................... 4
Figure 3: HIV prevalence point values from different sources in Tanzania, 2000 to 2007 ........................................... 4
Figure 4: Number of HIV positive persons nationally, in rural areas and in urban areas in Tanzania, 1980 to 2010 .................................................. 5
Figure 5: Projected AIDS deaths, using projection data from 2008 in Tanzania .................................................. 5
Figure 6: HIV prevalence amongst men and women aged 15 - 49 in Tanzania, 2003 and 2007 ............................................. 6
Figure 7: Patterns of HIV prevalence amongst discordant HIV couples in East Africa ............................................ 7
Figure 8: HIV prevalence by age group in Tanzania, 2003 and 2007 ................................................................. 7
Figure 9: Changes in HIV prevalence over time (between 2003 and 2007) amongst men and women of different ages, Tanzania ........................................ 8
Figure 10: AIDS case rates for cumulative AIDS cases by age and sex, Tanzania, 1987 – 2005 ........................................ 8
Figure 11: Changing patterns between HIV prevalence and education levels, Tanzania, 2003 and 2007 ...................... 9
Figure 12: HIV and levels of wealth, Tanzania, 2003 ........................................................................................... 9
Figure 13: Percentage men and women by marital status and HIV prevalence, Tanzania, 2003 ............................... 10
Figure 14: Projected HIV prevalence over time in Tanzania, 1980 to 2010 .......................................................... 11
Figure 15: HIV prevalence amongst women at ANC sites by location of ANC site, Tanzania, 2001 to 2005 ................... 11
Figure 16: HIV prevalence in regions in Tanzania, 2007 .................................................................................... 12
Figure 17: Rural:urban population ratios and HIV prevalence in regions in Tanzania, 2003 and 2007 ......................... 12
Figure 18: Percent of men that have completed secondary education and HIV prevalence in regions in Tanzania, 2003 ..... 13
Figure 19: Changes in HIV prevalence (from 2003 to 2007) and rural:urban population ratio (2003) in regions in Tanzania .................................................. 13
Figure 20: Projected HIV incidence rate nationally, in rural areas and in urban areas in Tanzania, 1980 to 2010 ......... 17
Figure 21: HIV incidence projection in 2008 ....................................................................................................... 18
Figure 22: Number of new infections nationally every year, in rural areas and in urban areas in Tanzania, 1980 to 2010 ......................................................... 18
Figure 23: HIV prevalence rate amongst different age groups of ANC clients , Tanzania, 2001 to 2006 ...................... 19
Figure 24: Age of sexual debut is increasing in Tanzania, 1999 to 2008 ............................................................... 20
Figure 26: PMTCT performance in Tanzania over time, 2000 to 2005 ............................................................... 24

List of Tables

Table 1: HIV prevalence and education levels in Tanzania – an inverse relationship beginning to form? ......................... 8
Table 2: HIV Prevalence and Residence, Tanzania 2003 and 2007 ......................................................................... 10
Table 3: HIV prevalence and other relevant characteristics in regions in Tanzania .................................................... 14
Table 4: % of men and women that have had two or more partners in Tanzania, 1992, 1996, 1999 and 2004 ............ 20
Table 5: Higher risk sex by men and women in Tanzania, 1996, 1999 and 2004 ..................................................... 21
Table 6: Condom use during casual sex by men and women in Tanzania, 1996, 1999 and 2005 ............................... 21
Table 7: Percent of individuals that accepted gifts or favours the last time they had sex with someone other than their regular spouse, 1994 22
Table 8: In response to a question “where did you hear about AIDS?”, in Tanzania 1996 ........................................ 26
1. Introduction

‘Managing for results’ is an effective principle for a country’s HIV response. It can be applied by:

- Setting ambitious but realistic results to aim for in the strategy planning process and in work plans, based on the latest data on the epidemic
- Measuring prevention, treatment, care and mitigation inputs, outputs and outcomes
- Ensuring that results-based data are used for learning and decision making in managing and improving programmes— not just for reporting and accountability – purpose of this report.

This report, prepared by the World Bank Global AIDS Monitoring and Evaluation Team on request from the UNAIDS service, AIDS Strategy and Action Planning (ASAP), and TACAIDS, is part of Tanzania’s efforts to improve the use of data for results-based management, learning and decision-making during the Joint Review. The report synthesizes, summarizes and packages data for use during the Joint Review, focusing on:

a) The latest evidence about the HIV epidemic – prevalence trends over time and heterogeneity (Section 3)  
b) What has caused these changes in the HIV epidemic over time and in different geographic areas? (Section 4)  
c) What should be done differently to improve the HIV response in the future? (Section 5)

2. Methodology

This report was developed by Marelize Gorgens of the Global AIDS M&E Team of the World Bank and Dr Rafael Kalinga of TACAIDS. The methodology was a secondary analysis of existing data relating to HIV prevalence, incidence, HIV-related behaviours, HIV-related policies and strategies, and available information about the HIV response in Tanzania mainland, after a purposeful literature search.

Searches carried out: Searches were carried out to locate the following documents:

- Tanzania HIV and syphilis sentinel surveillance reports from the National AIDS Control Programme’s website (www.nacp.go.tz)
- Other reports relating to HIV prevalence and incidence from the National AIDS Control Programme’s website (www.nacp.go.tz)
- Search for research articles from Google Scholar (http://scholar.google.com) and PubMed, using the search words “HIV incidence Tanzania”, and “HIV prevalence Tanzania”: resulted in 563 search results, of which 81 were relevant for the analysis
- Purposive search of documents from the TAZAMA project (www.tazamaproject), upon recommendation of Dr G Somi, Head of Epidemiology at MoHSW’s National AIDS Control Programme
- All national survey reports from Tanzania that were available on the MEASUREDHS website (www.measuredhs.com)
- Hard copies of reports provided by the UNAIDS country office

Acknowledgements: In preparing this report, ASAP and GAMET would like to thank the following individuals:

- Dr Luc Barriere-Constantin for his guidance throughout the process and Mr Fredrick Macha for his general support with sourcing documents – (both from the UNAIDS Tanzania office)
- Dr G Somi for his insights, wisdom and peer review of the draft report
- Ms Janet Leno of ASAP for her overall strategic guidance
- Prof David Wilson and Dr Nicole Fraser of the GAMET team for their peer review of the draft report, and for being sounding boards during various stages of the study
- Ms J Kusek, GAMET team leader, for her overall guidance and advice during the process.
- Mr Nathan Smith and Ms Gilly Arthur from the US government team, for supplying their literature review documents for the triangulation study
3. The HIV epidemic in Tanzania: ‘where have we come from and where is it going’?

3.1 HIV prevalence trends over time

HIV prevalence has stabilized at 6 - 7% and a secondary increase in prevalence into the future is likely. National HIV prevalence, the proportion of HIV positive individuals in Tanzania, steadily increased from 1983 until 1997, when projections indicate that national adult HIV prevalence peaked at 8% (see Figure 1). After 1997, national HIV prevalence gradually fell and plateaued at about 6.4% from 2005/06. A small secondary increase in prevalence has been projected, as a result of a small increase in rural incidence and the uptake of ARV services over the last five years. It is interesting that although only around 7% of projected AIDS cases were reported through AIDS case reporting in 2000, 2003 and 2005, the trends in AIDS case reporting reflect the national HIV prevalence estimates (NACP, 2006) – see Figure 2.

Figure 1: Projected Nat HIV prevalence in Tanzania, 1980 to 2010

![Graph showing projected national HIV prevalence in Tanzania from 1980 to 2010.](image)


Recent HIV prevalence data from various sources – HIV prevalence during sentinel surveillance of pregnant women at antenatal clinics, HIV prevalence of blood donors, and HIV prevalence in 2 rounds of population-based HIV surveillance surveys – confirm the recent stabilization of HIV prevalence in Tanzania (see Figure 3).

Figure 3: HIV prevalence point values from different sources in Tanzania, 2000 to 2007

![Table showing HIV prevalence point values from different sources in Tanzania, 2000 to 2007.](image)

Note to Figure 3: When interpreting the HIV prevalence data in Figure 3, keep in mind that there are sampling issues with each type of data:
- **ANC data**: ANC sites rapidly increased from 25 in 2001 to 92 sites in 2005, mostly with the addition of rural sites
- **Blood donor data**: Although blood donor data come from a large sample (> 120 000), 98% are replacement donors (i.e. family members) and 83% of donors are male.
- **Population-based studies**: Response rates for accepting HIV testing in population-based studies varied dramatically across regions (e.g. in 2003, 34% of respondents in Dar refused testing, as opposed to only 2% in Kagera). Given the HIV prevalence differences in these 2 regions, this could affect the national HIV prevalence estimates.

Sources: Drawn by author, using data from NACP 2001; NACP 2004; NACP 2005; NACP 2006; NACP 2007; THIS 2003-04; THMIS 2007-08
HIV positive persons in Tanzania were initially mostly found in urban areas, as this is where the oldest and first HIV epidemic in Tanzania unfolded. Over time, as the epidemic spread to rural areas – and due to the sheer number of persons living in rural areas (77% of the total population) – the number of persons living with HIV in rural areas surpassed the urban infections, and this trend is set to continue (see Figure 4).

Figure 4: Number of HIV positive persons nationally, in rural areas and in urban areas in Tanzania, 1980 to 2010

Sources: Drawn by author, using HIV projections data from NACP 2005

As a result of stabilizing HIV prevalence and lack of 100% uptake in ARVs, annual AIDS deaths are projected to increase over time (see Figure 5).

Figure 5: Projected AIDS deaths, using projection data from 2008 in Tanzania

3.2 Heterogeneity in HIV prevalence

Despite the national stabilization, HIV prevalence trends in Tanzania vary dramatically across sub-populations (grouped by different characteristics) - sex, education, wealth, marital status, where they live and how mobile they are. This is called HIV ‘heterogeneity’. These differences in HIV prevalence are important to know of and understand because Tanzania may need to respond to different sub-populations in different ways.

(a) Heterogeneity amongst men, women and in different age groups

Overall, women are more likely to be HIV positive than men: In both rounds of population-based HIV testing (2003 and 2007), women were overall more likely to be HIV positive (see Figure 6). An extremely high female:male prevalence ratio has been found in Kigoma in 2007 (15:1, see section 3.2 f). There are two exceptions to this general observation of excess female HIV risk:

i) Amongst ‘HIV-discordant couples’, there are more male-positive-female-negative couples than vice-versa (see Figure 7); and

ii) Among certain older age groups, men have higher HIV prevalence than women, as illustrated in Figure 8. This higher risk for older males was less pronounced in the 2007 survey data, compared to the 2003 data. AIDS case reporting data reflect this higher HIV burden in males within the older age groups (see Figure 9). This trend seems to be changing over time – in 2007, women were more likely to be HIV positive in all age groups - except for men aged 34 to 39. Figure 10 depicts the changing HIV prevalence over time across all age groups and sexes.

Figure 6: HIV prevalence amongst men and women aged 15 - 49 in Tanzania, 2003 and 2007

<table>
<thead>
<tr>
<th>Year</th>
<th>Women</th>
<th>Men</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>7.7</td>
<td>6.3</td>
<td>6.8</td>
</tr>
<tr>
<td>2007</td>
<td>4.7</td>
<td>5.8</td>
<td>5.8</td>
</tr>
</tbody>
</table>

Source: Graph drawn by author, using data from THIS 2003-04 and THMIS 2007-08

NOTE TO FIGURE 5:
Female: male ratio in 2003: 1.2 : 1
Female: male ratio in 2007 1.4 : 1
This correlates with the AIDS case reporting ratio (F:M HIV prev) of 1.2 : 1
Using EPP, a F:M ratio for new infections was predicting for 2005 (see Section 3.3 on incidence)
Figure 7: Patterns of HIV prevalence amongst discordant HIV couples in East Africa

![Pattern of HIV prevalence amongst discordant HIV couples in East Africa](image)

Sources: Graph drawn by author, using data from DHSs from Lesotho (2004), Kenya (2003), Uganda (2005)

Figure 8: HIV prevalence by age group in Tanzania, 2003 and 2007

![HIV prevalence by age group in Tanzania, 2003 and 2007](image)

Sources: Graph drawn by author, using data from THIS 2003-04 and THMIS 2007-08

Figure 9: Changes in HIV prevalence over time (between 2003 and 2007) amongst men and women of different ages, Tanzania

![Changes in HIV prevalence over time](image)

Sources: Graph drawn by author, using data from THIS 2003-04 and THMIS 2007-08
Community-level HIV prevalence and incidence studies in Tanzania suggest that HIV prevalence and incidence in urban areas, especially amongst young people, may be declining:

- Kwesigabo et al., 2005 found that in the Kagera region, reductions in HIV incidence and prevalence (both statistically significant) was most pronounced in younger women;
- Jordan-Harder found decreasing prevalence in Mbeya region amongst women aged 15 to 24 – Msuya et al had the same finding for a study in an Moshi urban district;
- Wambura et al. (2007) found in an open cohort study over a ten year period in Mwanza city (Tanzania’s second-largest city) that “HIV spread is continuing in rural areas, suggesting a need for more intensive HIV prevention efforts and ARVs. The leveling off in prevalence is attributable to a combination of high mortality among HIV-infected persons” and a slight decrease in incidence in roadside villages (amongst men and women, but most pronounced amongst women of younger ages).

(b) Heterogeneity across education levels

**Patterns of HIV by education level seem to be changing.** Up to 2004, at the population level, persons with higher education were more likely to be HIV positive – see Table 1. However, the latest population-based HIV surveillance survey (THMIS 2007-08) showed, for the first time at population level, that HIV prevalence was lower amongst educated than uneducated persons. The difference was larger amongst men (see Figure 11) and is consistent with recent research findings in Kilimanjaro Region that show an inverse relationship between HIV infection and education in 2005, compared to 1991 when higher education levels were associated with increased prevalence (Mmbaga et al, 2006):

<table>
<thead>
<tr>
<th>Education level</th>
<th>HIV prevalence 2001/2002 sentinel surveillance</th>
<th>HIV prevalence 2003/04 sentinel surveillance</th>
<th>THIS 2003-04</th>
<th>THMIS 2007-08</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>6.4</td>
<td>5.2</td>
<td>5.3</td>
<td>5.9</td>
</tr>
<tr>
<td>Primary incomplete</td>
<td>10.2</td>
<td>9.3</td>
<td>5.3</td>
<td>4.5</td>
</tr>
<tr>
<td>Primary complete</td>
<td>n/a</td>
<td>n/a</td>
<td>7.9</td>
<td>5.8</td>
</tr>
<tr>
<td>Secondary+</td>
<td>n/a</td>
<td>n/a</td>
<td>8.2</td>
<td>4.3</td>
</tr>
</tbody>
</table>

Sources: NACP, 2002; NACP, 2005; THIS 2003-04; THMIS 2007-08
In Tanzania, more wealthy persons are more likely to be HIV positive (see Figure 12), which is in line with the recent research finding by Mishra et al (2007) that HIV infection does not disproportionately affect the poorer in sub-Saharan Africa. This is also supported by the numerous findings (from THIS 2003-04, Bloom et al., 2002) that support the notion that employed persons, mobile persons, and persons with higher levels of economic activity are more likely to be HIV positive. This pattern has been consistent over time, and is supported by research about HIV, mobility, levels of education and levels of wealth (Kwesigabo et al., Mmbaga et al). It should, however, be kept in mind that the data presented in Figure 12 is from 2003, and wealth and education are quite strongly correlated, so the wealth-HIV pattern may have changed (HIV prevalence by wealth for 2007 was not yet available at the time this analysis was done).
(d) Heterogeneity relating to marital status

HIV prevalence is highest amongst those who are currently or formerly married. AIDS case reporting confirms the observation that more HIV prevalence amongst married than unmarried persons (NACP, 2006).

Figure 13: Percentage men and women by marital status and HIV prevalence, Tanzania, 2003

![Graph showing HIV prevalence and marital status](image)

Sources: Graph drawn by author, using data from THIS 2003-04

(e) Geographic heterogeneity: Residence

HIV prevalence in urban areas is much higher than in rural areas: According to population-based estimates, HIV prevalence in urban areas has been almost twice as high as in rural areas, as Table 2 summarises. Further, the urban HIV epidemic is comparatively older in Tanzania (see Figure 12 showing that the urban epidemic curve peaked earlier than the rural epidemic curve (Somi et al., 2006)) and has shown recent signs of contracting (see Figure 13). Figure 13 also suggests exceptionally high transmission intensities in areas of high mobility (average HIV prevalence in roadside ANC clinics at 15% and in border area ANC clinics at 20% ).

Table 2: HIV Prevalence and Residence, Tanzania 2003 and 2007

<table>
<thead>
<tr>
<th>% population who live in this location</th>
<th>% HIV+ (2003-04 THIS)</th>
<th>% HIV+ (2007-08 THMIS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban</td>
<td>23%</td>
<td>10.9%</td>
</tr>
<tr>
<td>Rural</td>
<td>77%</td>
<td>5.3%</td>
</tr>
</tbody>
</table>

Sources: THIS 2003-04, THMIS 2007-08
(f) Geographic heterogeneity: Administrative regions

There is great regional heterogeneity with adult HIV prevalence ranging from 1% to 15%. There are large differences across the 21 regions in Tanzania - some regions are primarily rural, others are primarily urban; some regions have high circumcision rates, others do not. There are very large differences in HIV prevalence levels across the regions, as Figure 14 shows, with HIV prevalence ranging from 1% in Kigoma Region to 15% in Iringa Region in 2007.

In Table 3, key characteristics of each region have been summarised, and Figures 15 to 17 explore the relationship between HIV prevalence and some of these characteristics. They show, for example, an inverse relationship between the rural:urban population ratio of a region (the higher this ratio, the more rural a region) and HIV prevalence. Figure 16 shows the change in HIV prevalence in a region (+ change = decline; - change = increase in prevalence) being strongly associated with the rural:urban population ratio, meaning that larger reductions in HIV prevalence have occurred in more urbanized regions.
The association is not as strong in the 2nd graph, although it remains statistically significant (p = 0.0001 in 2003 p = 0.07 in 2007). This shows how the relationship between prevalence and education levels may be changing over time, as the epidemic matured). Alternatively, this could also be because the epidemic began in urban areas and then spread into rural areas - education is only one factor correlated with urban/rural residence.
Figure 18: Percent of men that have completed secondary education and HIV prevalence in regions in Tanzania, 2003

![Graph showing the relationship between men completing secondary education and HIV prevalence.](image)

Source: Graph drawn by author using data from THIS, 2003-04; National Tanzania Housing and Population Census; THMIS, 2007

Figure 19: Changes in HIV prevalence (from 2003 to 2007) and rural:urban population ratio (2003) in regions in Tanzania

![Graph showing changes in HIV prevalence and rural:urban population ratio.](image)

Source: Graph drawn by author using data from THIS, 2003-04; National Tanzania Housing and Population Census; THMIS, 2007

Multiple regression of the factors in Table 3 shows that the following factors remained statistically significant over time in terms of trends observed, and that in the case of the R:U population ratio, the significance disappeared in the 2007 survey round:

<table>
<thead>
<tr>
<th>Factor</th>
<th>p-value 2003</th>
<th>p-value 2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>% men circumcised</td>
<td>0.00022</td>
<td>0.009984</td>
</tr>
<tr>
<td>R:U population ratio</td>
<td>0.000144</td>
<td>0.073274</td>
</tr>
<tr>
<td>% women that relies on someone else to make decisions about earnings</td>
<td>0.001635</td>
<td>0.021204</td>
</tr>
</tbody>
</table>
Table 3: HIV prevalence and other relevant characteristics in regions in Tanzania

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Arusha</td>
<td>5.3</td>
<td>14.6</td>
<td>1.4</td>
<td>19.2</td>
<td>12</td>
<td>0.4</td>
<td>96.2</td>
<td>17</td>
<td>14.3</td>
<td>1.0</td>
<td>2.2</td>
<td>28</td>
<td>12</td>
<td>20.1</td>
</tr>
<tr>
<td>Dar es Salaam</td>
<td>10.9</td>
<td>30.2</td>
<td>8.9</td>
<td>19.1</td>
<td>1.3</td>
<td>1.4</td>
<td>97.9</td>
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<td>1.7</td>
<td>96.9</td>
<td>3.1</td>
<td>1.7</td>
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<td>9.4</td>
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<td>1.4</td>
<td>37.7</td>
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<td>4.8</td>
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<td>2.7</td>
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<td>15.0</td>
<td>68.4</td>
<td>3.8</td>
<td>2.5</td>
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<td>7.3</td>
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<td>1.0</td>
<td>1.5</td>
<td>97</td>
<td>16.2</td>
<td>18.2</td>
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<td>4.5</td>
<td>8.8</td>
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<td>6.9</td>
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</tr>
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<td>4.9</td>
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<td>1.9</td>
<td>89</td>
<td>8</td>
<td>6</td>
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<td>7.5</td>
<td>13.5</td>
<td>12.4</td>
<td>3</td>
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<td>Mbeya</td>
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<td>0.9</td>
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<td>2.9</td>
<td>93.1</td>
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<td>2.1</td>
<td>96.9</td>
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<td>6.8</td>
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<tr>
<td>Rukwa</td>
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<td>1.2</td>
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<td>1.2</td>
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<td>4.3</td>
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<td>11.3</td>
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<td>10.1</td>
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<tr>
<td>Tabora</td>
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<td>4.9</td>
<td>2.0</td>
<td>1.3</td>
<td>42.8</td>
<td>2.7</td>
<td>6.2</td>
<td>1.0</td>
<td>6.8</td>
<td>16.2</td>
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<td>Tanga</td>
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<td>3.8</td>
<td>9.3</td>
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<td>2.5</td>
<td>95</td>
<td>8.7</td>
<td>13.3</td>
<td>1.1</td>
<td>3.6</td>
<td>17.3</td>
<td>22.2</td>
<td>4.5</td>
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</table>

(See Annex A for a map of all regions in Tanzania)
<table>
<thead>
<tr>
<th>Region Name</th>
<th>Mining activity1</th>
<th>Change in prevalence from 2003 to 2007 (positive change = reduction, - change = increase)</th>
<th>Other research results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arusha</td>
<td>Yes</td>
<td>3.9</td>
<td>No studies with prevalence or incidence data found</td>
</tr>
<tr>
<td>Dar es Salaam</td>
<td></td>
<td>2</td>
<td>Several studies pointed to the prevalence of HIV amongst IDUs, and studies have been done to support these findings (Ross et al; Williams et al). Studies have also shown that HIV prevalence has decreased over time (Urassa et al.)</td>
</tr>
<tr>
<td>Dodoma</td>
<td></td>
<td>1.6</td>
<td>No studies found</td>
</tr>
<tr>
<td>Iringa</td>
<td></td>
<td>-1.3</td>
<td>No studies found</td>
</tr>
<tr>
<td>Kagera</td>
<td>Yes</td>
<td>0.3</td>
<td>Sexual-related behaviours amongst bar and hotel workers have positively changed (more condom use, fewer concurrent or multiple partners, and reduced cultural practices that may have facilitated HIV transmission) (Tao et al.). Lugalla et al. confirmed these findings for the general population in Kagera region. Kwesigabo et al showed that in the early stages of the epidemic, HIV incidence reduced amongst women of younger ages in urban areas, but less so in rural areas. Watson-Jones et al found that HIV prevalence amongst female bar workers, women who work at truck stops were higher than in the general population. Mwaluko et al noted the consistent high patterns of HIV prevalence and that reductions were most visible in urban areas, and that the gap between urban and rural prevalence levels were decreasing</td>
</tr>
<tr>
<td>Kigoma</td>
<td>Yes</td>
<td>1.1</td>
<td>No studies found</td>
</tr>
<tr>
<td>Kilimanjaro</td>
<td>Yes</td>
<td>5.4</td>
<td>HIV prevalence amongst female bar and hotel workers was high (19%) and increased with age, number of sexual partners, and levels of condom use (Ao et al.), whereas a study in a rural village in the region (Oria) showed lower prevalence (5.6%), but higher prevalence amongst women than men. Trends in condom use and multiple sexual partners changed over time. Mmbaga et al showed that educated men and women were most likely to have changed their behaviour. In another study, Mmbaga et al also showed how behavioural trends have changed: younger men and women were most likely to change their number of sexual partners, and use condoms, whereas older men had not reduced their number of partners, but did use more condoms. Msuya et al suggest the same findings: HIV prevalence has decreased over time, and the decline was greatest amongst women aged 15 to 24.</td>
</tr>
<tr>
<td>Lindi</td>
<td></td>
<td>-0.3</td>
<td>No studies found</td>
</tr>
<tr>
<td>Manyara</td>
<td></td>
<td>0.3</td>
<td>Yahya-Malma et al found that HIV prevalence was more likely if you were a member of a fishing community, and in a separate study that HIV prevalence was the highest amongst rural females.</td>
</tr>
<tr>
<td>Mara</td>
<td>Yes</td>
<td>-1.8</td>
<td>Watson-Jones et al found that HIV prevalence amongst female bar workers, women who work at truck stops were higher than in the general population. Reports also suggest that mining activity is increasing in the region.</td>
</tr>
<tr>
<td>Mbeya</td>
<td>Yes</td>
<td>5.6</td>
<td>Riedner et al. found HIV prevalence of 68% amongst female bar workers, and Jordan-Harder noted the declines in prevalence between 1994/5 and 2000 for women in the age group 15 to 24</td>
</tr>
<tr>
<td>Morogoro</td>
<td></td>
<td>1.2</td>
<td>No studies found</td>
</tr>
<tr>
<td>Mtwara</td>
<td></td>
<td>4.4</td>
<td>No studies found</td>
</tr>
<tr>
<td>Mwanza</td>
<td>Yes</td>
<td>2.2</td>
<td>Reduction in incidence in roadside villages, especially amongst younger women, but increase in incidence amongst women in rural areas (Wambura et al., 2007). Watson-Jones et al found that HIV prevalence amongst female bar workers, women who work at truck stops were higher than in the general population.</td>
</tr>
<tr>
<td>Pwani</td>
<td></td>
<td>2</td>
<td>No studies found</td>
</tr>
<tr>
<td>Rukwa</td>
<td></td>
<td>1.5</td>
<td>Jordan-Harder noted the increase in prevalence in this region</td>
</tr>
<tr>
<td>Ruvuma</td>
<td></td>
<td>1.4</td>
<td>No studies found</td>
</tr>
<tr>
<td>Shinyanga</td>
<td>Yes</td>
<td>-1.1</td>
<td>Watson-Jones et al found that HIV prevalence amongst female bar workers, women who work at truck stops were higher than in the general population.</td>
</tr>
<tr>
<td>Singida</td>
<td></td>
<td>0.6</td>
<td>Yahya-Malma et al found that HIV prevalence was more likely if you were a member of a fishing community, and in a separate study that HIV prevalence was the highest amongst rural females.</td>
</tr>
<tr>
<td>Tabora</td>
<td>Yes</td>
<td>1.1</td>
<td>No studies found</td>
</tr>
<tr>
<td>Tanga</td>
<td></td>
<td>1.9</td>
<td>No studies found</td>
</tr>
</tbody>
</table>

1 'YES' included where the Tanzanian Revenue Authority (TRA) indicated 'mining' as a major industry in the region – as per their website [http://www.tra.go.tz/regions.htm](http://www.tra.go.tz/regions.htm)
(g) **Heterogeneity related to migration**

Although data on HIV and migration are not available at a population level (data about migration are collected in the DHS, but have not been analysed by migration status), several community-level studies have shown that numerous aspects of migration – being separated from one’s spouse (both the traveler and the one staying behind), the frequency of travel, and duration of time away from home - impact on sexual risk behaviours. A study in Kisesa found that high levels of short and long term mobility and being close to the trading centre were significantly associated with increased HIV incidence (Boerma et al., 1999, 2002). Another study in Kisesa (Kishamawe et al.) found that:

- “Overall, whereas long-term mobile men did not report more risk behavior than resident men, significantly more short-term mobile men reported having multiple sex partners in the last year.
- In contrast, long-term mobile women reported having multiple sex partners more often than resident women (6.8 versus 2.4%; P = 0.001), and also had a higher HIV prevalence (7.7 versus 2.7%; P = 0.02).
- In couples, men and women who were resident and had a long-term mobile partner both reported more sexual risk behavior and also showed higher HIV prevalence than people with resident/ short-term mobile partners.
- Remarkably, risk behavior of men increased more when their wives moved than when they were mobile themselves”.

Vissers et al. (2008) found that risky sexual behaviour in Arusha, Tanzania, occurred more often in mobile, co-resident men, and in women living apart from their husbands, who infrequently see them, than in men and women who are separated for long periods of time. Mobility is, however, not always associated with risky behavior: one study in Arusha, for example, found that Masai men do not have sex when they travel to towns on business (Coast et al.) – Cliff et al. supported this finding: they found that migrant mine workers in the north western part of Tanzania had lower HIV prevalence levels than the general population in the same areas.

(h) **Heterogeneity in specific sub-populations**

Specific sub-populations in Tanzania, such as fishing communities, females affected by sexual and domestic violence, military, truck drivers, and sex workers have a disproportionately high HIV burden (Fraser et al., 2008). Behavioural surveillance amongst refugees and surrounding populations by the GLIA (2006), and research by Tanaka et al. (2008) both noted that specific HIV-related behaviours had the potential to put refugees at increased risk of infection, but that the surrounding population can also have increased higher risk behaviour that put the refugee population at risk.

Watson-Jones et al found that HIV prevalence amongst female bar workers, women who work at truck stops were higher than in the general population. Cliff et al found great variation in HIV prevalence in two mines in the Lake zone – 42% of female recreational workers were HIV positive, 6% of male mine workers, 16% of male community members and 18% of female community members. Similar findings were evidenced in Moshi: bar and hotel workers had HIV prevalence of almost 4 times that of the general population (26% (Kapiga et al) vs 7% (Msuya et al))

### 3.3 HIV incidence trends over time

HIV incidence rates have, according to estimates and projections, evolved in the following ways (see Figure 20 and Figure 21):

- Urban incidence peaked in the late 1980s at about 3.4%, declined steeply to about 1% and is now presumed to have stabilised at about 1.4%;
- Rural incidence peaked approximately 4 years later in the early 1990s at about 1.5%, declined to about 0.5% thereafter, and has increased to a secondary plateau at about 0.7%;
- National incidence peaked at about 1.5% and is estimated to be at a stable level of 0.8%-0.9% in 2008.

---

2 Proportion of HIV negative individuals who become HIV positive over a period of time (usually 1 year) - e.g. 1% annual incidence = 1 person out of 100 HIV negative persons gets infected over a 1-year-period.
Community-level studies confirm these national level estimated findings: HIV incidence in urban areas increased before it did so in rural areas. Whilst incidence in urban areas has stabilized or fallen (especially amongst younger women), there is an increase in incidence in more rural areas (especially amongst women) (Wambura et al., 2007). It is important to understand whether HIV prevention messages are reaching these populations, and why incidence in rural women is increasing – is it because of increased higher risk sexual behaviour, or because these women are becoming the sexual partners of men from roadside villages?

Figure 22 plots the projected number of new HIV infections, illustrating the increasing number of people contracting HIV each year from the late 1990 onwards, due to population growth and the youthful demographic structure of the population combined with stable (possibly slightly increasing) HIV incidence rates - leading to approx. 220,000 new infections in 2008, of which almost two thirds are residents of rural areas. Figure 23 shows HIV prevalence data from 15 to 24 year old ANC clients (proxy for incidence), corroborating the notion that incidence has stabilized.

Figure 20: Projected HIV incidence rate nationally, in rural areas and in urban areas in Tanzania, 1980 to 2010

Source: Wambura et al., 2007

Source: Graph drawn by author, using data from HIV projections in 2005 (in NACP, 2005)
Figure 21: HIV incidence projection in 2008

Source: NACP, 2008 (incidence projections using Spectrum and EPP)

Figure 22: Number of new infections nationally every year, in rural areas and in urban areas in Tanzania, 1980 to 2010

Source: Graph drawn by author, using data from HIV projections in 2005
4. Risk Factors and Drivers that have impacted on trends in the HIV epidemic in Tanzania

In this section, we summarise the data that were available about risk factors for HIV transmission (and how these have changed over time) amongst individuals, at the community level and within the broader society.

4.1 Risk factors at the individual level

Individuals can change their behaviour and thus have control over two of the three factors that determine the reproductive rate – whether or not they are exposed to HIV and, if they are exposed, the probability of transmission during any single act of exposure – but not over the third factor (duration of infectivity). Exposure to HIV is the result of individual behaviour, whereas transmission probabilities are influenced by biological factors (such as circumcision status and the effectiveness of PMTCT efforts).

(a) Exposure to HIV

The data in this section should be viewed against the general consensus that sensitive behaviours tend to be under-reported in surveys and that reporting of sexual risk behaviour appears to be highly sensitive to survey design. Nnko, et al. (2004) found that 40% of married men and 3% of married women reported sexual partners other than their marital partners, but that women were mostly likely to report a partner who is well-educated, and that single men may be exaggerating their number of partners.

Age of sexual debut is increasing: The age of sexual debut has been pointed out in a number of studies (Mnyika et al., 1997) as being inversely associated with increased HIV prevalence (the lower the age of sexual debut, the higher the possibility of HIV infection), as Figure 24 shows.

---

3 Research conducted by Nnko et al. (2004) in rural Tanzania found that the overall rate of underreporting of sexual partnerships by women was of the order of 16%. Plummer et al. (2004) reported that the validity and reliability of reported sexual experience among school students in Tanzania was low (evidence of much higher levels of sexual activity were revealed by in-depth interviews and participatory methods than in structured interviews and questionnaires).
The percent of women reporting two or more partners is back at low levels, but the percent of men reporting more than one partner increased dramatically and remains high. After an initial increase in self-reported multiple partners, data show a reduction in the percent of men and women reporting two or more partners in 2004, as can be seen in Table 4. This change is more pronounced in urban than in rural areas, more pronounced amongst women than amongst men and more prevalent amongst young people (Mmbaga et al., 2007). These increases took place despite increasing recognition of the risks of multiple partners: between 1996 and 2004, there was an almost three-fold increase in the percentage of men and women who said, in response to an unprompted question, that HIV can be avoided by limiting sex to one partner (MEASURE DHS, 2004). It should be noted that the number of reported lifetime partners remained the same between 1992 and 2004: 2.3 partners for women and 6.4 partners for men.

Table 4: % of men and women that have had two or more partners in Tanzania, 1992, 1996, 1999 and 2004

<table>
<thead>
<tr>
<th></th>
<th>FEMALE</th>
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<th></th>
<th>MALE</th>
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<tr>
<td>Total</td>
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<td>6</td>
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<td>5</td>
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<td>26</td>
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<td>4</td>
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<td>8</td>
<td>16</td>
<td>5</td>
<td>7</td>
<td>30</td>
<td>31</td>
<td>23</td>
</tr>
<tr>
<td>Residence (All ages surveyed): Rural</td>
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<td>6</td>
<td>10</td>
<td>4</td>
<td>10</td>
<td>26</td>
<td>36</td>
<td>33</td>
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<tr>
<td>Education (All ages surveyed): No Education</td>
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<td>5</td>
<td>11</td>
<td>4</td>
<td>9</td>
<td>19</td>
<td>34</td>
<td>30</td>
</tr>
<tr>
<td>Education (All ages surveyed): Primary</td>
<td>4</td>
<td>7</td>
<td>12</td>
<td>5</td>
<td>10</td>
<td>28</td>
<td>36</td>
<td>31</td>
</tr>
<tr>
<td>Education (All ages surveyed): Secondary and Higher</td>
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<td>4</td>
<td>11</td>
<td>2</td>
<td>3</td>
<td>32</td>
<td>25</td>
<td>25</td>
</tr>
</tbody>
</table>

Source: MEASURE DHS, 2006

Married men are more likely than married women to report having a sexual partner who is not a spouse (21% of married men vs. 6% of married women), and this is much higher in rural areas and least frequent amongst those with most education (THIS, 2003-04; Nnko et al., 2004). These increases took place despite positive
changes in attitudes about multiple partners: between 1996 and 2004, there was an almost three-fold increase in the percentage of men and women who said, in response to an unprompted question, that HIV can be avoided by limiting sex to one partner (MEASURE DHS, 2004).

At a population level, casual sex (sex with a non-married and non-cohabitating partner) amongst women have remained constant and have increased amongst men: Unprotected casual sex carries more HIV risk than sex with a regular partner (even if just one person has had such sexual intercourse) because one is ‘connecting’ to the casual partner’s entire sexual network. Population-based data suggest that more men were having casual higher risk sex in Tanzania in 2004 than in 1996 - see Table 5. Increases are more pronounced at lower education levels (in men).

### Table 5: Higher risk sex by men and women in Tanzania, 1996, 1999 and 2004

<table>
<thead>
<tr>
<th></th>
<th>FEMALE</th>
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<th>MALE</th>
<th></th>
</tr>
</thead>
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<td>68</td>
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<td><strong>Age groups: 25-29</strong></td>
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<td>29</td>
<td>72</td>
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</tr>
<tr>
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<td>27</td>
<td>19</td>
<td>42</td>
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<tr>
<td><strong>Residence (All ages surveyed): Urban</strong></td>
<td>26</td>
<td>40</td>
<td>29</td>
<td>43</td>
</tr>
<tr>
<td><strong>Residence (All ages surveyed): Rural</strong></td>
<td>16</td>
<td>22</td>
<td>15</td>
<td>37</td>
</tr>
<tr>
<td><strong>Education (All ages surveyed): No Education</strong></td>
<td>12</td>
<td>22</td>
<td>12</td>
<td>24</td>
</tr>
<tr>
<td><strong>Education (All ages surveyed): Primary</strong></td>
<td>21</td>
<td>28</td>
<td>20</td>
<td>40</td>
</tr>
<tr>
<td><strong>Education (All ages surveyed): Secondary and Higher</strong></td>
<td>29</td>
<td>44</td>
<td>32</td>
<td>46</td>
</tr>
</tbody>
</table>

Source: MEASURE DHS, 2006

In community-level studies, a number of authors have found that reductions in casual sex are statistically significant with decreased prevalence of HIV (Msuya et al. (2007), Kapiga et al., Kwesigabo et al.), mostly in urban areas in Tanzania.

**Condom use during sex with a non-regular and non-cohabitating partner has significantly increased amongst men and women:** Rates of condom use during casual sex vary greatly by characteristic of respondents, and have also changed dramatically over time, as Table 6 shows. Although there has been an increase in the percentage of persons having sex with a casual partner (see Table 5), there have been even more pronounced increases in the percentage of men and women using condoms during casual sex:

### Table 6: Condom use during casual sex by men and women in Tanzania, 1996, 1999 and 2005

<table>
<thead>
<tr>
<th></th>
<th>FEMALE</th>
<th></th>
<th>MALE</th>
<th></th>
</tr>
</thead>
<tbody>
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<td><strong>Total</strong></td>
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<td><strong>Age groups: 20-24</strong></td>
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</tr>
<tr>
<td><strong>Age groups: 35-39</strong></td>
<td>16</td>
<td>22</td>
<td>33</td>
<td>32</td>
</tr>
<tr>
<td><strong>Residence (All ages surveyed): Urban</strong></td>
<td>27</td>
<td>32</td>
<td>48</td>
<td>41</td>
</tr>
<tr>
<td><strong>Residence (All ages surveyed): Rural</strong></td>
<td>10</td>
<td>15</td>
<td>22</td>
<td>28</td>
</tr>
<tr>
<td><strong>Education (All ages surveyed): No Education</strong></td>
<td>4</td>
<td>10</td>
<td>18</td>
<td>7</td>
</tr>
<tr>
<td><strong>Education (All ages surveyed): Primary</strong></td>
<td>17</td>
<td>24</td>
<td>33</td>
<td>32</td>
</tr>
<tr>
<td><strong>Education (All ages surveyed): Secondary and Higher</strong></td>
<td>35</td>
<td>44</td>
<td>56</td>
<td>47</td>
</tr>
</tbody>
</table>

Source: MEASURE DHS, 2006
Plummer et al supports these findings: they noted that in Mwanza, condom use with a 'risky' partner was common, but not with a regular partner. In community-level studies, it was found that early sexual debut, being young and unmarried, high mobility and having multiple sexual partners was associated with condom use (Mnyika et al., 2007), whereas Mmbaga et al. (2008) found that there were significant increases in condom use amongst young women and older men over a 15-year period.

**Paid sex / transactional sex:** In Tanzania, transactional sex, not necessarily seen culturally as commercial sex, has been in existence for a long time. “Some cardinal features about sex work in Tanzania are that:
- The sex worker’s first motivation is economic.
- The numbers of commercial partners are decreasing.
- Condom use has been accepted in short-term relationships.
- Condom use is rarely accepted in long term relationships” (NACP, 2001, citing Outwater et al., 2000).

These ethnographic data are also supported by quantitative data. In 1994, for example, many men and women accepted gifts or favours the last time they had sex with someone other than their regular spouse - see Table 7. Maganja et al. found that the youth described the exchange of sex for money and other material goods in all types of sexual relationships - casual and long-term relationships. Whereas young men described their pursuit of multiple partners as being sexually motivated, women described their reasons as being economically motivated. Young women reported that their financial dependence on their male sexual partners affected their ability to negotiate safer sex practices.

<table>
<thead>
<tr>
<th>Age group</th>
<th>Women</th>
<th>Men</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 – 19</td>
<td>20</td>
<td>16</td>
</tr>
<tr>
<td>20 – 24</td>
<td>14</td>
<td>16</td>
</tr>
<tr>
<td>25 – 29</td>
<td>18</td>
<td>15</td>
</tr>
<tr>
<td>30 – 39</td>
<td>7</td>
<td>21</td>
</tr>
<tr>
<td>40 - 49</td>
<td>4</td>
<td>11</td>
</tr>
</tbody>
</table>

Source: Tanzania KAP, 1994

In 1999, up to 17% of persons in urban areas indicated that their last sexual encounter with a non-regular partner was in exchange for gifts or favours. As the nature of this question in population-based surveys has changed over time to include only commercial sex, the rates of paid sex appear to have dramatically decreased, but this is most likely due to differences in the way the question is asked, and social desirability biases. By 2003, only 1.8% of men said that they paid for sex, and this fell even further to 1.5% in 2007. The rates of paid sex are, however, not uniform – in the coastal zone, rates of paid sex are more than double that of the western and central zones. It has been widely accepted that commercial sex is linked to the tourism industry (Lugalla et al., 2007), which is concentrated along the coastal areas of Tanzania.

**HIV transmission through needle sharing during injecting drug use is increasing as the practice increases:** Recent studies have confirmed the existence of a small, but growing, population of injecting drug users. Most of these studies have been done in Dar es Salaam, and the prevalence of injecting drug use is therefore not yet widely understood. That said, the studies that have been done point to greater HIV risk amongst individuals with this behaviour and also in bridging populations, as needle-sharing injecting drug users also do sex work to fund their substance use (Ross et al., 2008). This raises the risk of more transmission from IDU/sex workers into the general population (provided that there are sufficient numbers of IDUs to sustain the epidemic in this sub-population).
(b) Per act probability of transmission

**Male circumcision:** In Tanzania, 70% of men are circumcised. Circumcision rates vary greatly across regions, and the practice is not only associated with one specific religion (98% of Muslims and 68% of Protestants indicated in 2003 that they were circumcised (Urassa et al., 1997; THIS, 2003-04; Weiss et al., 2008)). Nnko et al (2001) provided the following useful information about circumcision practices and attitudes in Tanzania: “Data from a factory workers study and a rural cohort study in northwest Tanzania were used to analyze the levels and determinants of male circumcision status and assess the reliability of self-reported data. Qualitative data from focus group discussions and in-depth interviews were obtained to ascertain norms and values in relation to male circumcision.

[We found that] male circumcision has become more popular in recent years, and 21% of 3,491 men reported themselves as circumcised. An increase in circumcision rates was observed in the rural cohort study during 1994 to 1997, though reporting inconsistencies are common. Circumcision rates were higher among men with higher levels of education and in Muslim men. Men are often circumcised in their late teens or twenties. The reasons for the increasing popularity of circumcision were investigated in group discussions and in-depth interviews. The most frequently mentioned reason was health-related; circumcision was thought to enhance penile hygiene, reduce sexually transmitted disease incidence, and improve sexually transmitted disease cure rates. **Male circumcision is becoming more popular among a traditionally non-circumcising ethnic group in Tanzania, especially in urban areas and among boys who have attended secondary schools.**

It is also important to note that the changes in circumcision status and perceptions about circumcision are occurring mostly (and firstly) amongst educated men and men who live in urban areas (Urassa et al., 1997). Weiss et al. (2008) found positive attitudes towards circumcision by young people in some areas of Tanzania, and that only 84% of those who said they were circumcised, had had their foreskin removed.

From the latest population-based HIV survey, it appears that there is an inverse relationship between the regional prevalence of circumcision and regional HIV prevalence, as Figure 25 shows (this is in agreement with internationally reported ecological data on male circumcision rates and HIV prevalence). This relationship remained statistically significant over time (p = 0.0002 in 2003 and p = 0.009 in 2007).

**PMTCT:** Providing antiretroviral drugs to women before and during child birth, and to the infant after child birth, can reduce the risk of transmission of HIV from mother to child. In Tanzania, PMTCT coverage has increased since 2002, when the PMTCT programme was introduced – as Figure 26 shows.
4.2 Household, community and society level drivers that may affect HIV transmission

Over the last 25 years, life in Tanzania has changed considerably. Not only is the political landscape a lot different, but population growth has been rapid (population density has increased from 14 persons per square kilometer, to 39 persons per square kilometer), and economic development has been strong, with economic growth around 6.3% since 2000 (World Bank, 2008). There have been significant reductions in the levels of stigma and discrimination towards HIV positive persons – in 1992, for example, 32% males and 18% females felt that AIDS patients should be quarantined or put in jail. This has dramatically decreased, with 89% of Tanzanians now having accepting attitudes towards people living with HIV (TDHS 2004-05), up from 79% in 1996. In this section, we describe data relating to community-level factors that could influence the decisions a person makes about HIV-related risk (which Haram, 2005, summarised by showing how people make decisions about sexual behaviour within the context of power and gender relationships).

Gender inequality increases women's risk for HIV infection: Sa and Larsen (2008) found that economic deprivation (e.g. husbands not contributing to children’s expenses) and experiences of sexual violence were significantly associated with a woman being HIV positive. Changes in attitudes are also evident: Between 1999 and 2004, there has been an almost doubling of persons (from 55% to 94%, MEASURE DHS, 2006) who felt that a woman can refuse sex with her husband or insist on condom use if he has an STI. In a qualitative study in Dar Es Salaam, Lary et al. found that there were complex interactions between violence, forced sex, and infidelity. Men who were violent toward female partners, for example, also frequently described forced sex and sexual infidelity in these partnerships, and men in concurrent partnerships tended to become violent if their fidelity was questioned.

Community level factors such as the level of economic activity and levels of community mobility impact on HIV infection levels. Bloom et al (2002) discovered that controlling for community level effects such as the level of social and economic activity, ratio of bar workers per male population aged 18-59, the level of community mobility, and distance to the nearest town were significantly related to HIV, in addition to individual level risk factors (education, male circumcision, type of work, and number of household assets).
5. Summary: Trends in the HIV epidemic and Risk Factors in Tanzania

The national adult HIV prevalence increased from low levels in 1981 to a peak of 8.1% in 1995, then gradually decreased to 6.5% in 2004 and 5.8% in 2007, and resulted in an estimated 1.8 million HIV positive persons by 2007. HIV prevalence is expected to increase in the future as the effect of scaled-up ARV treatment increasingly starts to contribute to HIV prevalence levels through better survival of PLHIVs. At the onset, the epidemic was growing fastest in areas with larger or border towns, high population mobility (temporary migration due to labour factors), more employment and wealth, with more educated persons. Over time, the relationship between education and HIV risk changed with less educated persons becoming more likely to be HIV positive than more educated individuals.

Tanzania has a mature epidemic with annual HIV incidence stabilizing just below 1% (estimated incidence in urban areas is about double the incidence in rural areas, 1.4% vs. 0.7%). The absolute number of new infections has grown steeply over time, particularly in rural areas, due to population demographics. Overall, females are at significantly higher risk of being HIV infected than males (2007 national survey: females 15-49 40% more likely to be HIV+, females 15-24 are 33% more likely to be HIV positive than their male counterparts).

There are also significant differences in HIV prevalence levels across the various regions of Tanzania. The reasons for these differences are related to (a) prevalence of male circumcision in the region; and (b) percentage of population in urban areas in each region.

Sexual behaviour patterns in Tanzania have changed significantly over the last 15 years. The percentage of adult men that report having multiple sexual partners and sex with non regular, non co-habitating partners has increased (far more than among women), but a larger percentage use condoms when having sex with a casual partner.

The reduction in population-based HIV prevalence (at the national level) is more pronounced at younger ages (with the exception of women aged 20-24), with small decreases (and some increases) in older age groups, as illustrated in Figure 27. These changes in HIV prevalence over time are consistent with the changes in sexual behaviour observed in the two surveys: positive behaviour changes (reduction in frequency of multiple sexual partners, reductions in the frequency of sex with casual partners, later sexual debut and increased condom use) have been more marked among young men and women than older adults.

Figure 27 also depicts a possible change in the prevalence trends (and behavioural trends) over time. It shows that the biggest reductions in prevalence have been in the male population, not the female population as many of the region-level or community-level studies have shown. These studies have, however, been undertaken before these two

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4 This is consistent with a similar finding by De Walque (2004) that in Uganda, initially, higher education levels were associated with higher HIV prevalence, but this changed, and later in the epidemic lower education levels were associated with higher HIV prevalence.
rounds of surveys and it could be that this graph (which compares 2003 and 2007 prevalence values) is pointing to a new trend. Another factor to keep in mind is that the refusal rates for the HIV prevalence testing varied significantly across regions, and this could have skewed results too (see Table 3).

6. How have we been responding? Recommendations for the Joint Review

In 2008, Tanzania launched its second National Multisectoral Strategic Framework. This Framework lays the foundation for the HIV response in Tanzania in the next five years. Given the evidence about HIV transmission summarised in this report, this section considers the implications of these findings and other recent research studies, for the nine HIV prevention strategic objectives in the NMSF.

Prev Strategic Objective 1: Promote abstinence, delayed sexual debut, partner reduction and consistent condom use among young people in and out of school

Progress has been made with behaviour change: behaviour amongst young adults seems to be changing with delayed sexual onset and increased condom use, despite increased levels of sex with casual partners. That said, there are also high-risk populations within Tanzania that are not yet focused on, and the NMSF’s almost exclusive focus on young adults seems to be slightly misplaced within the context of Tanzania’s slowing-urban, increasingly-rural epidemic. A more balanced approach may be needed – the focus on young people should continue, but should be balanced with social change communication programmes (to change society norms and standards around multiple partners) in the rural areas of Tanzania, focusing on older adults and persons who migrate on a short basis for employment purposes.

In terms of the communication messaging, print media and health workers may not be the best approaches. The evidence from the DHS suggests that radio programs and peer educators would be more effective ways to deliver prevention information (Table 8).

Table 8: In response to a question “where did you hear about AIDS?”, in Tanzania 1996

<table>
<thead>
<tr>
<th></th>
<th>Female respondents</th>
<th>Male respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radio</td>
<td>64%</td>
<td>87%</td>
</tr>
<tr>
<td>Friend</td>
<td>65%</td>
<td>55%</td>
</tr>
<tr>
<td>Health worker</td>
<td>24%</td>
<td>12%</td>
</tr>
<tr>
<td>Newspapers</td>
<td>18%</td>
<td>34%</td>
</tr>
</tbody>
</table>

Recommendation for the Joint Review: It is suggested that Tanzania consolidate and communicate the progress made with behaviour change, and continue to focus on women – especially women in their early 20s, emphasize partner reduction and risks of unprotected sex in partnerships where the HIV status and sexual network of the partner is not known, and focus on older adults in urban and rural areas.

Prev Strategic Objective 2: Reduce risk of HIV infection among the most vulnerable populations

Before the advent of the new NMSF, main avenues of HIV transmission in Tanzania were considered to be either sexual transmission, or transmission from mother to child. Although the new NMSF recognises the importance of focusing on the most at risk populations, implementation guidelines are not available and the size of the populations most at risk is not known.

Recommendation for the Joint Review: (a) What is suggested, first of all, is a size estimation study to determine the approximate numbers of IDUs, sex workers and MSM in Tanzania, and focus group discussions with them to better understand their behaviors, attitudes, etc. After this, appropriate decisions can be made about the kinds of prevention interventions that are most likely to be effective in reaching these persons and their networks and enabling them to protect themselves and their partners from HIV infection. (b) Specific programmes for other populations with disproportionately high HIV burdens such as fishing populations, females affected by sexual and
domestic violence, female sex workers (also those not formally known as sex workers), mine workers, the military, and the families in which these populations are located, are suggested – also that such efforts be coordinated with the GLIA’s implementation processes.

**Prev Strategic Objective 3: Expand workplace interventions, with special attention to mobile and migrant workers**

Mobility and short-term migration has been shown to be associated with increased HIV risk in the Tanzania data. Whilst workplace programmes exist, programmes for mobile workers have not been implemented at scale (including programmes for short term migrant workers).

**Recommendation for the Joint Review:** It is suggested that (a) Integrated prevention programmes urgently be implemented in all major trading centres (including centres that are not in areas classified as trading areas); (b) specific programmes be designed that would be appropriate to men and women of higher education levels in urban areas who travel for short periods of time (for example, to a workshop or business meeting in another town in Tanzania); (c) that all HIV implementers include HIV prevention messaging and condom distribution as part of HIV-related workshops so as to set an example (e.g. whenever HIV workshops take place to discuss the NMSF or district-level HIV planning); (d) focus integrated workplace programmes in locations where migrant workers are found (large factories, transport organizations, plantations) and ensure that these programmes focus on social change communication, and not only HIV testing; and (e) that the 2007 THMIS and future surveys that collect sexual behavioural and HIV biomarker data also include questions on time spent away from home and analyse these data as an HIV risk factor.

**Prev Strategic Objective 4: Prevent, treat and control other sexually transmitted infections (STI)**

Whereas there is plausible biological evidence that STIs increase HIV transmission, some new findings in terms of STI control as an effective HIV prevention strategy has emerged. Contrary to what observational studies suggested in earlier years and the randomized control trial in Mwanza, Tanzania in the 1990s, evidence from all other randomised controlled trials for STI control in the past ten years seem to suggest the efficacy of STI control as an effective HIV prevention strategy (Sangani et al., 2004; Gray and Waver, 2008). Researchers have suggested that this is in part because “observational studies about the associations between sexually transmitted infections and HIV acquisition are susceptible to confounding, because both infections are transmitted by the same sexual risk behaviours” (Gray and Waver, 2008), but also because of the implementation challenges associated with the syndromic management approach to STI control. Sangani et al (2004) found that there were varying levels of compliance with syndromic management guidelines, and no significant changes in treatment-seeking behaviour or service uptake (Sangani et al., 2004). A recently completed study amongst sex workers in Zimbabwe (Cowan et al., 2008) showed that amongst HIV-1 positive and HSV-2 positive female sex workers, suppressive acyclovir therapy had no effect on the rate of HIV genital shedding despite reduction in genital HSV-2 – adding to the body of knowledge that HSV-2 treatment is not effective as an HIV prevention strategy.

It therefore seems that despite their common behavioral pathways, STIs and HIV are not necessarily highly correlated at the population level. We have numerous examples of countries with high STI rates that have not experienced commensurate HIV epidemics. Also, therefore, the hypothesis that reducing STI infection reduces HIV transmission has been extensively tested and at least 8-9 trials have found no effect. There is thus insufficient evidence to support STI treatment for HIV prevention.

Offering STI treatment to vulnerable populations, including sex workers and men-having-sex-with-men, who may have a high STI burden, may help to build rapport, trust and solidarity and as such may be a component of a comprehensive intervention.

Finally, STIs are an important health problem in their own right - greater than HIV in many countries - and as such STI control for the general population should be a priority, but in keeping with the recommendations of the Commission on AIDS in Asia, financed by non-HIV health resources.
Recommendation for Joint Review: These findings do not mean that STI control is not important as a public health intervention. STI treatment and control should continue as a public health intervention. What is, however, suggested is that Tanzania revisits its strategies around STI control and HIV prevention.

Prev Strategic Objective 5: Promote and expand HIV testing and counseling services

Between 1996 and 2004, the percentage of persons who know their HIV status increased from 4% F and 11% M (TDHS 1996) to 15% F and 11% M. There are significant variations: people in urban areas in the highest wealth quintile and of highest education levels had double the overall HIV testing rates at 30% or higher. It is also in these populations (wealthier, more educated persons in urban areas) that the HIV epidemic initially spread.

A recent meta-analysis of research about the effectiveness of VCT as an HIV prevention measure has shown that “VCT recipients were significantly less likely to engage in unprotected sex when compared to behaviours before receiving VCT, or as compared to participants who had not received VCT. VCT had no significant effect on the number of sex partners. While these findings provide only moderate evidence in support of VCT as an effective prevention strategy, neither do they negate the need to expand access to HIV testing and counseling services” (Denison et al., 2007:363). Other studies have shown positive behavioural outcomes for HIV positive persons (Eisele et al., 2008), but negative outcomes for HIV negative persons (who either increase or maintain their high risk behaviour after testing negative) (Corbett et al., 2007; Potts et al., 2008).

Other studies (Kendall et al., 2008) have also shown that HIV positive persons do not always engage in safer sex practices - either with their regular partners or with casual partners. Given the large pool of already-positive persons in Tanzania, it is important to focus on these persons to ensure that they themselves adopt safer sex practices consistently, and to ensure that there is careful good counseling for people who test positive.

From this review of recent research it is clear that HIV counseling and testing is not a panacea for HIV prevention - just as it is simplistic to assume that HIV education will necessarily lead to behaviour change, it is simplistic to assume that once a person knows their HIV status, they will automatically change their behaviour to reduce their risk of becoming infected or infecting others.

Recommendation for Joint Review: HIV counseling and testing is important as an entry point for care and support, and to support HIV prevention efforts. The focus in HIV prevention should remain on changing social and society norms around sexual behaviour. It is suggested that persons who test positive should be given HIV prevention education and materials on a routine basis as part of the care and support provided to them.

Prev Strategic Objective 6: Prevent mother to child transmission of HIV

From an epidemiological point of view, PMTCT is highly effective in reducing HIV infection from mother to child, and has been scaled up in recent years. What is important, is to avoid HIV transmission during pregnancy (of HIV negative women). This high risk has been pointed out in a number of studies (Gray et al (2005) Uganda; and Shisana et al (2005) in South Africa both showed the increased incidence in (recently) pregnant women).

Recommendation for Joint Review: No recommendations from an epidemiological perspective.

Prev Strategic Objective 7: Promote and distribute condoms

There is a clear demand in Tanzania for condoms, with reported levels of condom use increasing dramatically. Condoms also work as an HIV prevention strategy, if used consistently and correctly. What is, however, alarming, is the general notion in Tanzania that you ‘use a condom with a casual partner, but not with your regular partner’.

Recommendation for Joint Review: It is suggested that messaging around condom distribution and use should focus on the importance of consistent condom use - ‘using a condom some times, if you have multiple partners or concurrent partners - is not going to be effective’. Concomitantly, risk perception in any sexual relationships between partners who have not tested for HIV or who have multiple partners should be increased, in order to improve condom demand by those at risk.
Prev Strategic Objective 8: Prevent HIV transmission through blood transfusions, exposure to contaminated body fluids and contaminated instruments

This intervention is successful, and HIV prevention efforts are working -- blood products are tested before use. However, because a replacement donor system is mostly used there is a risk of HIV transmission through blood products if blood is donated during the early period after infection (the “window period” when HIV antibody testing may not detect HIV). Epidemiologically, universal precautions work to reduce accidental exposure to HIV, as long as these programmes are implemented comprehensively.

Recommendation for Joint Review: It is recommended that efforts be considered to expand the volunteer blood donor system, with appropriate screening measures.

Prev Strategic Objective 9: Introduce new prevention interventions

Male circumcision is listed in the NMSF as a new prevention intervention. There is agreement in Tanzania that male circumcision has been proven to work as an HIV prevention tool, and research in Tanzania shows that (a) most of the male population is already circumcised; (b) male circumcision is accepted in most parts culturally and for personal hygiene purposes and practiced by persons of all religions in Tanzania, and (c) that more persons in urban than rural areas are circumcised. Tanzania is also currently undertaking research in Mara and Manyara about male circumcision, to address the fact that “in almost all regions of Tanzania, there is a dearth of information regarding cultural attitudes and practices towards male circumcision, the safety of the procedure and techniques used in both clinical and traditional settings and the capability of the existing health service infrastructure to deliver safe male circumcision services. Such information is needed to establish strategies for effective programming and scaling up of safe male circumcision practices in Tanzania” (NIMR, 2006). The objective of this study is to “investigate the context, extent and pattern of male circumcision practices in selected areas of Tanzania and to provide recommendations to the government of Tanzania on the effective roll-out of male circumcision services in the country.”

Recommendation for the Joint Review: As the Mara-Manyara study is concluded and recommendations for the roll-out of male circumcision practices are considered, it is recommended that (a) male circumcision services be made available in rural areas; (b) that the general acceptability of male circumcision (not only for HIV prevention purposes but also for the purpose of personal hygiene) form a cornerstone of the communications campaign; and that (c) attention is given to the understanding and addressing possible misunderstandings, given the finding in one study that a high percentage of men who reported that they were circumcised, had not had their foreskin removed.
Annex A: Regions in Tanzania

Source: TDHS, 2004-05
Annex B: Mining activity in Tanzania

- Diamond mines
- Main mines
- Carbonite mines
- Uranium mines
- Other mines (copper, iron etc)
- Petrol or gas
Annex C: HIV prevalence in regions in Tanzania, 2003

Key
- 7% or higher
- 4.5 - 6.9%
- < 4.5%