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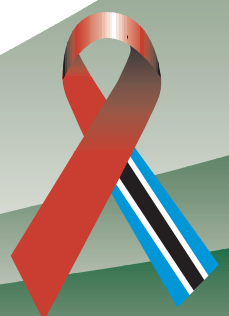
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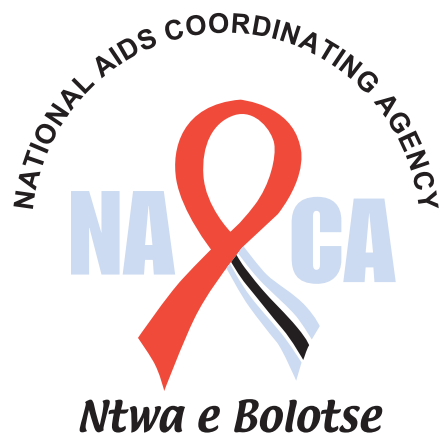


BOTSWANA 2003 SECOND GENERATION HIV/AIDS SURVEILLANCE



A Technical Report
December 2003





For further details contact

National AIDS Coordinating Agency (NACA)

Private Bag 00463

Gaborone

Botswana

Tel: (+267) 390 31 88

Fax: (+267) 390 32 73

www.naca.gov.bw

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Edited by:

Dr. Kereng Masupu (NACA)

Dr. Khumo Seipone (AIDS/STD unit)

Dr. Thierry Roels (BOTUSA/CDC)

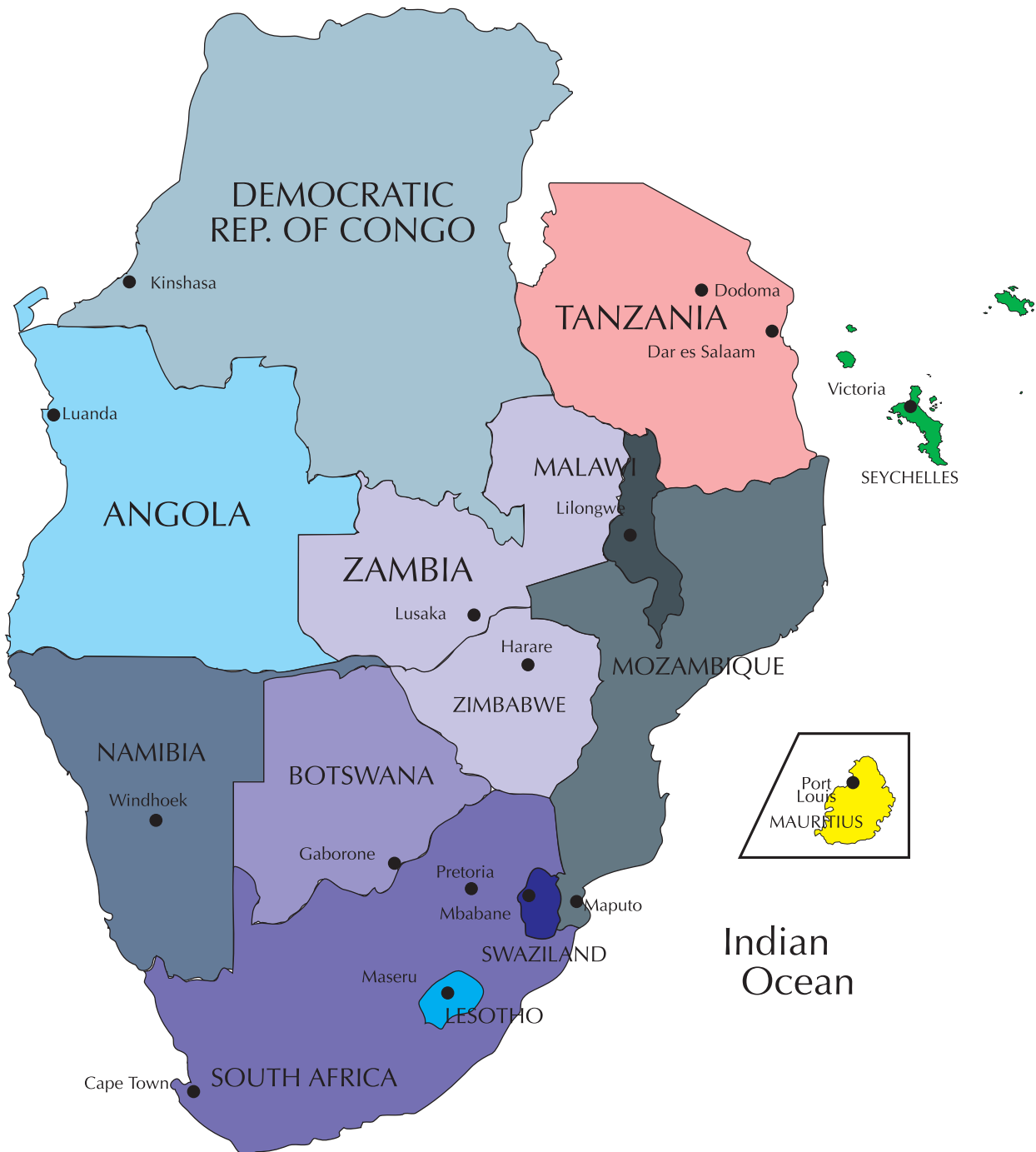
Dr. Soyeon Kim (BHP)

Mrs. Mpho Mmelesi (NACA)

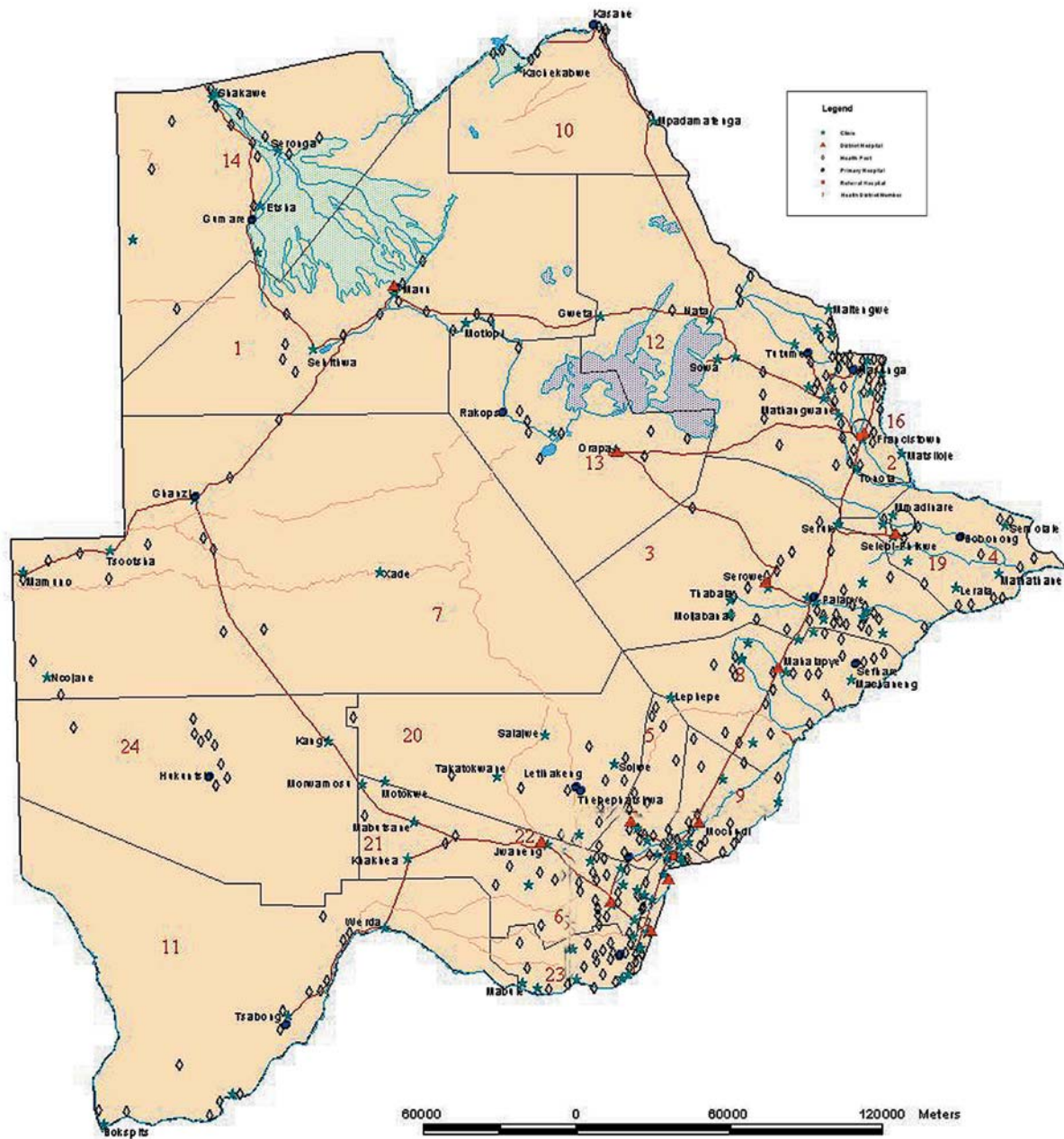
Prof. Ekanem Ekanem (UNDP Consultant)

Mrs. Sarah Gaolekwe (NBTS)





HEALTH FACILITIES IN BOTSWANA





FOREWORD

Botswana is often cited as a success economic and good governance story in Africa. Pivotal to this success has been health, in which Botswana had notably reduced its infant and under-five mortality and increased its life expectancy in the 90's. However there has been a threat to these achievements due to the scourge of HIV/AIDS that has reversed notable achievements made in the nation's quality of life.

We are facing a situation where every Motswana is either infected or affected; having lost a relative, friend, workmate or an acquaintance to the pandemic. For Botswana, factors that drive the epidemic are multiple, intertwined and complex and these have social-cultural and economic antecedents. In realizing the complexity and magnitude of the disease, Government has shown an unprecedented high level of political and economic commitment to its control by declaring war against it, and adopting a multi-sectoral approach. Coupled with this was a call to the international community to assist and this has resulted in tremendous response in the form of funding and technical support.

Locally, the private sector, civil societies including people living with HIV/AIDS (PLWA) organizations, have risen to the occasion to form a partnership with government in fighting the epidemic. The national response has resulted in setting up prevention programs such as behavior change and communication, Voluntary Counseling and Testing, STI Control and prevention of mother to child transmission (PMTCT). Care and support programs have been scaled up to include public provision of Highly Active Antiretroviral Therapy (HAART) and Community Home Based Care Programs. Impact mitigation and reduction in stigma have been addressed at all levels by providing funding for income generating activities, support for orphans and vulnerable children, and greater involvement of PLWA in the national response.

Sentinel surveillance has been quite useful over years in providing information on the magnitude of the problem in the country. There is also a need to closely evaluate the extent of the scourge and the impact of the national response through special population-based survey.

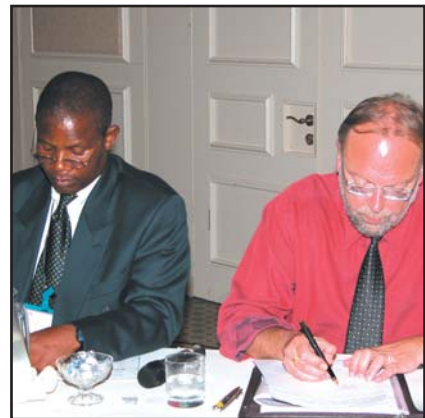
The nation's vision 2016 is halting the epidemic; reversing trend in incidence of HIV infection and improving the quality of life of the people.

"Batswana, letsema le thata ka mong wa lona!"

Ntwa e bolotse!



Festus G. Mogae
President of the Republic of Botswana
(Chairman, National AIDS Council)
November, 2003



PREFACE

HIV/AIDS is spreading relentlessly worldwide with 40 million people infected and over 70 percent of those in sub-Saharan Africa. The death toll continues to rise. In many developing countries HIV/AIDS has become one of the leading causes of mortality.

Botswana is not spared, with its prevalence among pregnant women aged 15-49 in 2003 reaching 37.4%. The prevalence in 2002 was 35.4% and 36.2% in 2001 suggesting that the epidemic curve may have reached its plateau state. For Botswana, there is a glimpse of hope that the number of new infections may not be increasing dramatically as in the early phases of the epidemic. This assertion is based on the observation that HIV prevalence in the 15-19 years old pregnant women has remained fairly stable over the last four years. A disturbing trend however is emerging where rural prevalence is on the increase while urban prevalence is stabilizing. This might be a reflection of the disparity of intervention programmes nationwide and therefore efforts need to be re-enforced to bridge the gap and therefore reverse the trend.

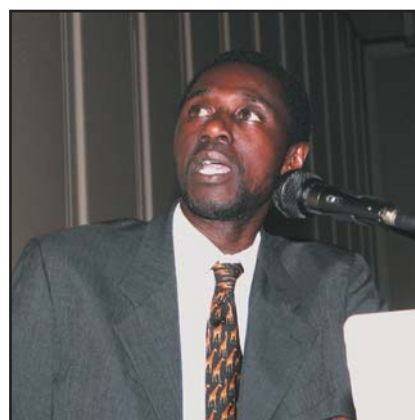
The high prevalence is coupled with an increased number of AIDS, TB and Genital Herpes cases and other AIDS-related illnesses. The result has been a huge burden in a limited resource health care system, with increased bed occupancy rates to over 100% in most medical wards and increased average length of stay to over 14 days for medical patients over the years. However, this trend is expected to reverse with the introduction of anti retroviral treatment provision

in 2002, which currently has enrolled 9228 patients out of the estimated 110 000 living with AIDS. The success of the ARV and PMTCT programs are further expected to result in increased life expectancy currently estimated at 56 years and infant mortality rate at 57 per 1000 years.

Since there is no cure for AIDS at the moment and no vaccines against the virus are currently available, the impact of HIV/AIDS will only be reduced through behavior change combined with the provision of ART to those already affected as well as VCT for those with uncertain sero-status. For Botswana, this is a bigger challenge because PMTCT data and VCT data reveal low testing rate due to reluctance of the population to access these services. The adoption of positive attitude to testing is the key to prevention and treatment, hence the reduction of the impact of the epidemic.



Hon MP, L Motsumi
Minister of Health
Vice Chairperson, National AIDS Council



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The National AIDS Coordinating Agency in collaboration with the Ministry of Health, AIDS/STD Unit, Ministry of Local Government, Central Statistics Office and all the district teams would like to pass their sincere gratitude to all those who contributed in making the 2003 Second Generation HIV surveillance a success.

Our sincere gratitude goes to all district health teams, made up of the public health specialists, nurses and laboratory scientists. All these personnel have shown their undivided commitment in making this survey a success despite their day-to-day workload.

We would like to thank all those who participated in the data management consensus meetings, which were held in Kasane, Maun and Gaborone for contributions they made towards the compilation of this report. Mention must be made to the notable contributions made by NASTAD and CDC Regional Office in Harare. We are indebted to valuable contributions made by Mr. Peter Carr and Dr Dennis Nash (NASTAD) and Dr A. D. McNaghten (CDC) especially in providing technical support in the area of data management.

This report would not have been successful without the technical contribution of institutions such as WHO, BOTUSA/CDC, Botswana Harvard AIDS Institute, NASTAD and other stakeholders.

Finally I would like to extend my sincere gratitude to all the staff of National AIDS Coordinating Agency, the Ministry of Health, Ministry of Local government, CSO staff and the Data Management Team for the commitment and dedication they have placed in making this document a success.



A. B. Khan, MD, MPH

National Coordinator

National AIDS Coordinating Agency (NACA)

CONTENTS

Foreword	i
Preface	iii
Acknowledgements	v
List of Figures	viii
List of Tables	ix
List of Abbreviations	x
Executive Summary	1
1. Introduction	3
2. Survey Objectives	4
3. Methodology	5
3.1. HIV sentinel survey	5
3.1.1 Sentinel population	5
3.1.2 Sentinel sites	5
3.1.3 Sample size	5
3.1.4 Sampling scheme	5
3.1.5 Duration of survey	6
3.1.6 Training	6
3.1.7 Support visits	6
3.1.8 Specimen handling	7
3.1.9 Laboratory	7
3.1.10. Data management	7
3.1.10.1 Data compilation, data entry and data cleaning:	7
3.1.10.2 Data analysis:	8
3.1.11 Assumptions in estimations	9
3.1.12 Limitations	10
3.2. Drug-Resistance among HIV-1c Infected, Treatment-Naive Adults in Botswana	11
3.3 CD4 Cellcounts among HIV-Negative Batswana	11
3.4 Tebelopele HIV Voluntary Counseling and Testing (VTC) Program	12
3.5 HIV/AIDS Case Reporting and Mortality Data	12
3.6 Prevention of Mother to Child Transmission (PMTCT)	12
3.7 Behavioural Surveys	13

3.8 Data on Sexually Transmitted Infections	13
3.9 Data on Tuberculosis	13
4. Results	14
4.1. HIV sentinel surveillance	14
4.2. Drug-Resistance Among HIV-1c Infected, Treatment -Naive Adults in Botswana	34
4.3. CD4 Cell Counts Among HIV-Negative Batswana	35
4.4. Tebelopele VCT Programme Data.	36
4.5. HIV/AIDS Case Reporting and Mortality	39
4.6 PMTCT	44
4.7 Behavioural Surveys	45
4.8. Sexually Transmitted Infection Programme Data	48
4.9. Tuberculosis Programme Data	49
5. Discusssion	51
6. Conclusions	54
7. Recommendations	55
8. Appendices	57
8.1. Calculated sample sizes per district	57
8.2. Sentinel Survey Data Collection Form	58
8.3. Aggregate syphilis test result reporting form, 2003 HIV sentinel survey	59
8.4. First time ANC attendees during the survey period and their syphilis test results by age	60
8.5. Laboratory results form	61
8.6. a: Worksheet for calculating district and national adjusted prevalence (females).	62
b: Worksheet for Adjusted HIV Prevalence by District (Males)	63
8.7. Tebelopele VCT Form (Page 1)	64
8.7. Tebelopele VCT Form (Page 2)	65
8.8. HIV request form	66
8.9. BANGUI & ABIDJAN DEFINITIONS OF CLINICAL AIDS (IN ADULTS)	67
8.10. TB Register form	68
8.11. Comparison of 2002 and 2003 HIV Results by Individual Age Groups	69
8.12. Enrollment of first time Tebelopele VCT Program Attendees by Sex and Age Group	72
8.13. HIV Prevalence by Education Among First Time VTC Attendees	73
8.14. Demographic Characteristics of Makgabaneng Radio Listenership Respondents	74
8.15. Names of Participating Staff and Health Facilities	75
8.16. HIV Prevalence by site, 1992 to 2003	82

LIST OF FIGURES

Fig 1. Age-specific seroprevalence of HIV among Botswana pregnant women, 2003 HIV Sentinel Surveillance	17
Fig 2. Adjusted HIV prevalence by residence and age, pregnant women, 2003 Sentinel Surveillance, Botswana	23
Fig 3. Adjusted HIV prevalence in pregnant women by district, 2003 Sentinel Surveillance, Botswana	24
Fig 4. HIV prevalence distribution by district, 2003 Sentinel Surveillance, pregnant women, Botswana	25
Fig 5. Adjusted HIV prevalence trends, 2001-2003, Sentinel Surveillance, Botswana	27
Fig 6. Age specific HIV prevalence trends, 2001-2003, Sentinel Surveillance, Botswana	28
Fig 7. Trend in HIV prevalence among pregnant women by age group, Sentinel Surveillance 1992-2003, 2003 Sentinel Surveillance, Botswana	29
Fig 8. Syphilis test results by age group, pregnant women, 2003 Sentinel Surveillance, Botswana	33
Fig 9. HIV prevalence among men and women aged 15-49. Tebelopele VCT centers, 2003 Botswana	36
Fig 10. HIV prevalence by residence, Tebelopele VCT centers, 2000-2003, Botswana	37
Fig 11. HIV prevalence according to reported condom use over the past three months by gender, Tebelopele VCT centers, 2000-2003, Botswana	37
Fig 12. Percentage of respondents reporting consistent condom use in the previous 3 months by gender, Tebelopele VCT centers, 2000-2003, Botswana	38
Fig 13. Age and sex specific prevalence of HIV among those requested to undergo testing, 2000-2003, Botswana	38
Fig 14. HIV Positivity rates by residence, AIDS case reporting 2000 –2003, Botswana	39
Fig 15. Cumulative AIDS Cases in Botswana, 2000 - 2003	40
Fig 16. Distribution of reported AIDS cases by age, 2000-2003	41
Fig 17. Number of reported AIDS cases in Botswana by district, 2000-2003	42
Fig 18. Crude mortality rate, Botswana, 1995-2000	43
Fig 19. AIDS Proportional mortality ratio, Botswana, 1995-2000	43
Fig 20. Knowledge of HIV/AIDS among men and women: percent with correct responses to five AIDS knowledge questions, Makgabaneng Radio Listenership Survey 2003	45
Fig 21. Percentage of Respondents who ever had an HIV test by age group and gender, Makgabaneng Radio Listenership Survey, 2003	46
Fig 22. Number of sexual partners in the last year among those who had sex (percent distribution), Makgabaneng Radio Listenership Survey, 2003	46
Fig 23. Condom use by gender at last act with a non-marital or non-cohabiting partner by age, Makgabaneng Radio Listenership Survey, 2003	47
Fig 24. Annual number of STI cases in Botswana, 1995-2001	48
Fig 25. Annual trends of new cases of TB per 100,000, 1991-2002	50

LIST OF TABLES

1.	Enrollment and completeness of information, 2003 Sentinel Surveillance, pregnant women, Botswana	14
2.	Socio-demographic characteristics of women enrolled in the 2003 Sentinel Surveillance, Botswana	15
3.	Results of laboratory quality assurance, Pregnant Women, Botswana 2003 HIV Sentinel Surveillance	16
4.	HIV prevalence according to reported marital status, pregnant women, 2003 HIV Sentinel Surveillance, Botswana	18
5.	HIV prevalence according to education, pregnant women, 2003 HIV Sentinel Surveillance, Botswana	19
6.	HIV prevalence by employment status, pregnant women, 2003 HIV Sentinel Surveillance, Botswana	20
7.	HIV prevalence according to occupation, pregnant women, 2003 HIV Sentinel Surveillance, Botswana	21
8.	HIV prevalence according to number of pregnancies, 2003 HIV Sentinel Surveillance, Botswana	22
9.	Comparison of 2001, 2002 and 2003 HIV prevalence by district, pregnant women, 2003 HIV Sentinel Surveillance, Botswana	26
10.	Estimated number of HIV infected adult females per health district and age group in Botswana, based on prevalences in pregnant women 2003 Sentinel Surveillance, Botswana	30
11.	Estimated number of HIV infected adult males (15-49 years) per health district and age group, derived from 2003 prevalence data for pregnant women, combined male and female infection rate ratios from Tebelopele VCT centers and health facilities, and 2001 census population figures, 2003 Sentinel Surveillance, Botswana	31
12.	Syphilis test results per district, pregnant women, 2003 HIV Sentinel Surveillance, Botswana	32
13.	Prevalence of genotypic resistance to ARV drugs among HIV-1C infected adult Botswana from the 2001 Sentinel survey (n=71)	34
14.	CD4 Lymphocyte Counts (Cells/mm ³) of HIV-negative adults in Botswana	35
15.	Number of HIV Requests and positivity rates by year, 2000 - 2003	39
16.	AIDS cases by age group and year, 2000-2003	41
17.	2002 PMTCT participation, HIV Testing and AZT Therapy	44
18.	2002 TB Case notification by district, by age group, National TB Programme, Epidemiology and Disease control unit, MoH, Botswana	49

LIST OF ABBREVIATIONS

AIDS	Acquired Immuno-deficiency Syndrome
ANC	Antenatal Clinics
ARV	Anti-retroviral
ASU	AIDS/STD Unit
BAIS	Botswana AIDS Impact Survey
BHP	Botswana Harvard Partnership
BHRIMS	Botswana HIV Response Information Management System
BOTUSA	Partnership between Botswana and the United States of America Governments
CDC	Centers for Disease Control and Prevention, Atlanta, Georgia
CI	Confidence Interval
CSO	Central Statistics Office
DHT	District Health Team
DNA	De-oxyribonucleic acid
EDTA	Ethyl-diamino Tetra Acetate
ELISA	Enzyme Linked Immunosorbent Assay
EPTB	Extra Pulmonary Tuberculosis
ESR	Erythrocyte Sedimentation Rate
FBC	Full Blood Count
HAART	Highly Active Anti-Retroviral Therapy
HIV	Human Immunodeficiency Virus
MOH	Ministry of Health
NACA	National AIDS Coordinating Agency
NASTAD	National Alliance of State/Territorial AIDS Directors
NGO	Non-Governmental Organization
NHRL	National HIV Reference Laboratory
NNRTI	Non-nucleotide reverse transcriptase inhibitor
PCR	Polymerase Chain Reaction
PI	Protease Inhibitor
PMR	Proportional Mortality Ratio
PMTCT	Prevention of mother-to-child transmission
PPT	Plasma Preparation Tube
PTB	Pulmonary Tuberculosis
RT	Reverse Transcriptase
STD	Sexually Transmitted Diseases
STI	Sexually Transmitted Infections
TB	Tuberculosis
UNAIDS	Joint United Nations Programme on AIDS
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
VCT	Voluntary Counseling and Testing
WHO/AFRO	World Health Organization Regional Office for Africa

EXECUTIVE SUMMARY

Since 1992, Botswana has been monitoring the HIV epidemic through annual sentinel surveillance of pregnant women attending antenatal clinics. This approach, tagged “first generation HIV surveillance” has been found useful in providing data for creating awareness of the problem among the public and decision makers. The data have been used for making estimates and projections for the country and for mobilizing support for national HIV intervention programmes. The first generation surveillance did not however provide an opportunity for tracking risky behaviours that may be fueling the epidemic. It also did not provide a link between behavioural and biological data; hence there was always the difficulty in explaining the epidemiological patterns of the infection and changes in prevalence observed over time. The second generation HIV/AIDS surveillance strategy embarked upon, and presented in this report, is an attempt to examine data from various sources in order to increase the explanatory power of sentinel survey data and enhance use of data from other sources.

The specific objectives of this expanded surveillance approach were to:

- Determine the prevalence of HIV and syphilis infection among pregnant women in different geographic locations of Botswana
- Estimate the current number of infected persons aged 15-49 years in the general population
- Investigate the existence of HIV strains resistant to ARV drugs in the Botswana population
- Describe the socio-cultural behaviours and other factors that may be fueling the epidemic
- Determine the level of CD4 counts among HIV-negative Botswana

The sentinel survey in 2003 was conducted in all the 22 districts and a total of 7251 pregnant women attending antenatal clinics participated. Blood samples were collected from June 30 to September 19, 2003 and tested for HIV antibodies in an unlinked anonymous approach using the Murex HIV 1.2.0 test kit and for syphilis by Rapid Plasma Reagin (RPR) test.

Data from other sources were analyzed. These included programme data from Tebelopele VCT centers; data on AIDS cases as well as Tuberculosis, PMTCT and sexually transmitted infections reported from health facilities. Behavioural data were based on the Makgabaneng Radio Listenership Programme Evaluation Survey, which covered seven districts.

The FASCount system was used to determine absolute CD4 and CD8 values while ViroSeq HIV-1 Genotyping System was used for evaluating viral resistance to ART.

Overall HIV prevalence in the country was 37.4% and ranged from 25.7% in Southern to 52.2% in Selebi Phikwe district. In more than two-thirds of the country the prevalence was over 30% and in over one-third of the country the prevalence exceeded 40%. There was no marked difference in HIV prevalence between urban and rural areas.

The highest age-specific prevalence was observed among those aged 25-29 years. VCT data showed significantly higher HIV prevalence among young women than in men of similar ages.

While the prevalence in older age groups appears to be increasing, the prevalence in the age group 15-19 years has remained fairly stable ranging from 21 to 23% between 2002 and 2003. Currently, about 283,764 adult Botswana aged 15-49 years are living with HIV/AIDS.

A median CD4+ count among HIV-negative Batswana was 599 cells/mm³. Prior to the introduction of country-wide HAART, Batswana did not harbour HIV strains resistant to ARV drugs.

The number of TB cases in the country is on the increase. Similarly, the crude mortality rate over the last decade has been increasing while the proportional mortality ratio of AIDS has remained stable in the last few years.

From the seven districts sampled for the Radio Listenership Program Evaluation Survey, about one in five young persons have correct knowledge on HIV transmission. Condom use in the last sexual act with a non-marital and non-cohabiting partner was over 60%. However, the proportion of people with multiple partners in the surveyed 7 districts was still high at 32% for men and 17% for women.

From the available data, it can be observed that HIV/AIDS in Botswana remains a great challenge. It would be misleading to assume that the epidemic is over. It would be tragic if there were complacency in response. Currently about one in three persons aged 15-49 years are living with HIV. This is a threat to the very existence of the nation of Botswana.

Fortunately, there is good leadership as demonstrated by high level of political and economic commitment on the part of the government of Botswana. The private sector, civil societies including PLWA organizations have risen to the occasion to form a partnership with government in fighting the epidemic. The national response has resulted in setting up prevention programs such as behavior change communication, Voluntary Counseling and Testing, STI Control and Prevention of mother to child transmission (PMTCT). Care and support programs have been scaled up to include provision of Highly Active Antiretroviral Therapy and Community Home Based

Care Programs. Impact mitigation and reduction in stigma have been addressed at all levels by providing funding for income generating activities, support for orphans and vulnerable children, and greater involvement of PLWA. The Government, people of Botswana and collaborating partners must maintain this momentum so as to bring the epidemic under control.

Based on the results above, the following recommendations are made:

- There is a need to intensify HIV/AIDS intervention programmes especially among the young persons so as to reduce the rate of new infections
- In addition to sentinel surveillance, there is a need to closely evaluate the extent of the scourge and the impact of the national response through special population-based surveys
- Survey design strategies that would eliminate or minimize ecological fallacies need to be adopted in the conduct of future behavioural studies so as to enable proper linkage with biological data
- There is a need for extensive community mobilization for increased patronage of voluntary counseling and testing services
- Tuberculosis control programme efforts need to be intensified and national treatment algorithms for Tuberculosis as well as for STIs need to be reviewed
- There should be a scaling up of anti-retroviral programme to meet the needs of the increasing number of infected persons
- In subsequent sentinel surveys, the minimum number of specimens tested during quality control per laboratory should be increased. Criteria for acceptance of results should be specified in the survey protocol

1. INTRODUCTION

According to The Joint United Nations Programme on AIDS (UNAIDS) estimates, globally, about 40 million people are currently living with HIV/AIDS. An estimated 5 million people became infected with HIV/AIDS in 2003. Over the next decade, without effective treatment and care, they will join the ranks of the more than 20 million people who have died of AIDS since the first case in 1981. However, the vast majority of people have not yet acquired the HIV, enabling them to protect themselves against it. Providing adequate and affordable treatment and care to people living with HIV, represents two of the biggest challenges facing mankind today.

HIV/AIDS marks a severe development crisis in sub-Saharan Africa, which remains by far the worst affected region of the world. The total number of people living with HIV/AIDS in sub-Saharan Africa by 2003 is between 25-28.2 million. As the impact of AIDS continues to threaten the African society, African leaders are mounting a large-scale response to fight HIV/AIDS, targeting all sectors. Botswana is among the 19 African nations that have established National AIDS councils or commissions personally chaired by the Head of State to take charge of a multi-sectoral response to AIDS. The epidemic in some countries is still in its early stages and effective responses are possible. In other countries, the epidemic has reached an advanced stage affecting a large percentage of the population. The epidemic is steeped in stigma and discrimination. Fear and denial also hinder the collection of adequate data to adequately assess the exact magnitude of the problem.

The interplay of multiple factors obscures causal linkages and prevents categorical conclusions. Second generation surveillance compares information on HIV prevalence and the behaviours that spread it. In Botswana where the epidemic is generalized, second

generation provides information to help better understand the behaviours driving the epidemic and indicates the success of the response and provides essential information for planning care and support.

The epidemic in the country is fueled by several factors such as the extreme mobility of the population, high prevalence of some sexually transmitted diseases, sexual behavior pattern which include multiple partners and frequent change in partners, rapid urbanization leading to breakdown of the traditional mechanisms for controlling social and sexual behavior. Poverty and relative gender inequality among women are all contributing factors.

Since 1992, Botswana has been monitoring the HIV epidemic through annual sentinel surveillance of pregnant women attending antenatal clinics. This approach, tagged "first generation HIV surveillance" has been found useful in providing data for creating awareness of the problem among the public and decision makers. The data have been used for making estimates and projections for the country and for mobilizing support for national HIV intervention programmes. The first generation surveillance did not however provide an opportunity for tracking risky behaviours that may be fueling the epidemic neither did it provide a link between behavioural and biological data; hence there was always the difficulty in explaining the epidemiological patterns of the infection as well as changes in prevalence observed over time. The second generation HIV/AIDS surveillance strategy embarked upon, and presented in this report is an attempt to pool data from various sources (HIV sentinel seroprevalence survey, VCT programme data, PMTCT, STI and TB surveillance results, behavioral surveillance findings and AIDS case reporting) in order to increase the explanatory power of sentinel survey data and to better understand the dynamics of the epidemic.

2. SURVEY OBJECTIVES

The overall objectives of the expanded HIV surveillance survey were to obtain relevant, appropriate, sufficient and accurate data on the status of the epidemic in order to guide programming, interventions and policies in the country.

The specific objectives of this expanded surveillance approach were to:

- Determine the prevalence of HIV and syphilis infection among pregnant women in different geographic locations of Botswana
- Estimate the current number of infected persons in the general population
- Investigate antiretroviral drug resistance (ART), resistant HIV strains
- Describe the socio-cultural behaviours and other factors that may be fueling the epidemic
- Determine the level of CD4 counts among HIV-negative Batswana

3. METHODOLOGY

3.1. HIV SENTINEL SURVEY

3.1.1 Sentinel population

In 2003, only pregnant women were included in the sentinel survey. Inclusion and exclusion criteria (eligibility criteria) were developed to delineate the target population and to minimize the risk of multiple sampling of individuals.

Inclusion criteria:

- Pregnant women 15-49 years old with a first ANC visit of their current pregnancy.
- Attending a public health facility that has been selected to participate in the 2003 survey during the survey period that lasted from 30th June through 19th September 2003.

3.1.2 Sentinel sites

The 2003 HIV sentinel surveillance survey included all 22 Health Districts. Of these, seven districts were involved in a resistance testing study. A major district clinic was selected as the primary sentinel site. However, due to the inability of many major district clinics to yield the required sample size, satellite clinic sites were also included to achieve the targeted sample size. The satellite health facilities selected were those with the highest number of ANC attendees in the previous year.

The major criteria for selecting participating sentinel and satellite sites:

- The candidate facility provides services for the selected sentinel population
- Blood is routinely drawn from patients/clients as part of routine care or service provided at the facility
- A reliable laboratory is available to perform the routine laboratory tests as well as the serologic tests for HIV antibody
- The facility is readily accessible
- The facility provides services to relatively large number of people so that an adequate sample size can be obtained
- The facilities are located in different geographic areas, urban and rural, or areas of special concern for the prevention programme
- Facility staff is capable of conducting surveillance

3.1.3 Sample size

Sample sizes were calculated for each sentinel site taking into consideration the 2002 HIV prevalence in the particular health district, the level of confidence desired for the prevalence estimate, the accuracy and the logistical feasibility.

Appendix 8.1 shows the targeted sample sizes calculated for the 22 health districts. The calculated sample size ranged from 116 to 400.

3.1.4 Sampling scheme

A consecutive sampling scheme was used. Clinic personnel knowledgeable about the inclusion criteria ascertained patient eligibility and enrolled women into the survey at the time of the prenatal consultation. During this routine antenatal consultation, the survey form (Appendix 8.2) was completed in addition to the collection of routine service information in the ANC. Demographic Information on age, sex, marital status, parity, employment status, occupation, and education was collected on the survey form. Aggregate syphilis data for the 12-week survey period was compiled from service records at the end of the survey using the syphilis survey form (Appendix 8.3 and 8.4).

Each survey form was completed in triplicate using serially numbered self-carbonating forms; the third copy of the form remained at the originating health facility, the second copy of the form was sent to the

District Health Office, whilst the original copy of the form was sent to NACA in batches at the end of each week.

Once the form was completed, the routine ANC blood was drawn consisting of one red top (5ml) tube without anticoagulant and one purple top (5ml) with EDTA anticoagulant. For the seven districts participating in the resistance testing study, different tubes were used. One white top tube with PPT anticoagulant and one purple top (5ml) with EDTA anticoagulant were used. No additional blood was collected. Personal identifiers were removed from the specimen (see specimen handling section) before being sent to the laboratory.

Efforts were made to over sample women in the age group 15 to 19 years in three districts Gaborone, Kweneng East, and Francistown.

3.1.5 Duration of survey

The enrollment period was 12 weeks from June 30th to September 19th, 2003. All sites commenced sample collection at the same time and stopped at the end of the survey period. Samples collected beyond the survey period were not included in the analysis.

3.1.6 Training

The Surveillance Technical Working Group conducted a series of training sessions at the district level in March/April 2003. Health officials trained included public health officers, community health nurses, matrons, and laboratory personnel. Four training sessions were held for the 22 DHTs (two in the south and two in the north). Topics that were covered included: Second generation HIV surveillance, standard operating procedures, data collection tools, laboratory techniques, national training requirements for BHRIMS, universal safety precautions, antiretroviral therapy, and presentation of the 2001 resistance study results. The

importance of high levels of cooperation and support was highlighted for the surveillance programme to be successful.

A consensus was reached regarding the guidelines at a fifth consensus meeting with all 22 districts represented. The final guidelines were then used for training health personnel at the facility level. Training was held in June 2003 for all participating facilities. The training was conducted by DHT health personnel and was supported by the surveillance technical working group in 20 districts.

The main objective was to train staff (midwives) on the sentinel surveillance protocol and procedures, using the finalized version of the guidelines and to distribute survey material. Non-midwives and staff from facilities that were not on the participation list were also trained by some DHTs in order to limit the constraints of staff shortage.

3.1.7 Support visits

The NACA surveillance team conducted support visits that covered 22 districts and five follow up visits during the survey period. The objectives of these visits were to:

- Discuss general issues regarding compliance to the guidelines
- Provide support materials
- Reconcile data received at NACA with data received from the DHT
- Reconcile laboratory sentinel survey book numbers with those received at NACA and verify fax copies for legibility from original copies
- Verify the sentinel survey booklet distribution list generated at NACA against the actual survey booklet distribution list at DHT
- Confirm availability of survey materials using a standardized checklist
- Assess storage conditions of specimens

3.1.8 Specimen handling

After the blood was drawn, the two blood tubes were kept in a rack upright at room temperature. The purple top tube was labeled with the woman's name and was sent to the laboratory for routinely performed tests of hemoglobin level, rhesus factor, and ABO grouping.

After allowing the natural clotting process to occur, the serum in the red top tube was then separated into two 1.8 ml cryovials by the facility staff. One vial was labeled with the patient's name and served for the routine syphilis test. The other vial served for the anonymous HIV test and was labeled with an adhesive unique code number that was found on the corresponding form.

The blood specimens were sent to the respective district laboratories on the same day. When this was not possible, specimens were kept in the facility's refrigerator at 4°C until transportation was available.

For women who consented for an HIV test as part of the nation-wide PMTCT program, a separate HIV request form was completed and a third tube (red top) was collected and labeled with the HIV request code according to the national PMTCT guidelines. The HIV surveillance program therefore did not interfere with the PMTCT program at any stage.

3.1.9 Laboratory

Twenty-five laboratories participated in the survey from the 22 districts. Seventeen of the sites did the HIV testing in their districts, while others sent their samples to the National Health Laboratory in Gaborone. Laboratories were asked to fax the test results on laboratory summary sheets (Appendix 8.5) to NACA at the end of each week.

Left over specimens were stored in the district laboratory refrigerators at 4°C and later transferred in cool boxes containing ice to the National Health Laboratory for Quality Assurance. These leftover specimens were stored in a serum bank at -76°C for further studies.

All laboratories used a standardized test kit for the survey specimens. The coded unlinked aliquots were screened for HIV antibodies by Murex HIV 1.2.0 test (Murex Biotech Limited). This test has a specificity of 99.91% and a sensitivity of 100%. The Rapid Plasma Reagin, RPR test (Randox Laboratories) was used for syphilis testing.

An independent central laboratory (Botswana HIV Reference Laboratory) participated in the quality assurance (QA) program by parallel testing randomly selected samples using diagnostic ELISA algorithm (Murex HIV 1.2.0 (Murex Biotech Limited)). For each storage box, random numbers between 1 and 100 were generated and used to select 17% of the specimens from each box based on sample locations within the 10x10 or 9x9 grid storage boxes. The samples were thawed for a maximum of 2 hours before being tested and read on the universal plate reader ELx800 (Bio-Tek). Some of the selected specimens could not be tested due to insufficient volumes and clotting.

3.1.10. Data management

3.1.10.1 Data compilation, data entry and data cleaning

A team made up of technical officers from the National AIDS Coordinating Agency (NACA), the BOTUSA/CDC Project, Botswana-Harvard AIDS Institute Partnership, the Ministry of Health AIDS/STD Unit (ASU), the National Health Laboratory, was responsible for the daily management of the survey and met weekly to discuss survey progress.

NACA staff received survey data weekly from two independent sources:

- 1) district health teams mailed batches of questionnaires with the socio-demographic data and
- 2) participating laboratories faxed HIV test results. Before entry, data collection forms were first checked for completeness of data, obvious errors and inconsistencies. Phone calls were made to the districts for clarification and correcting errors.

Data entry and laboratory result forms were then scanned and entered in an Information Bank Database system. This procedure allows for efficient long-term electronic storage and retrieval of document, images of data collection forms. Two independent pairs of data entry clerks then entered the scanned images into the database.

The databases were exported in a dbase IV (DbF) format and were compared for inconsistencies. EpiInfo 2002 statistical software (Centers for Disease Control and Prevention, Atlanta, GA, USA) was used for this validation procedure. A series of validation runs and data entry error corrections were performed before the two datasets were 100% concordant.

Consensus meetings (two in the North, two in the South) were organized with representatives from NACA, NASTAD, National Health Laboratory, the district health teams, and the laboratory personnel to reconcile missing data, such as forms without corresponding results, or results for which there were no corresponding forms.

3.1.10.2 Data analysis

Analysis was done using EpiInfo 2002, STATA (STATA Corporation, College Station, TX, USA), StatXact version 3.0.2. (Cytel Software Corporation) and SAS.

For each district, crude HIV prevalence per age group, civil status, education, employment, occupation, and number pregnancies were calculated.

HIV prevalence by location type (urban vs. rural) was also calculated. The Health districts were classified as urban or rural as follows:

Urban: Serowe/Palapye, Kweneng East, Southern, Mahalapye, Kgatleng, South East, Gaborone, Francistown, Lobatse, Selebi Phikwe.

Rural: Ngami, North East, Bobirwa, Gantsi, Chobe, Kgalagadi, Tutume, Boteti, Okavango, Kweneng West, Goodhope, Hukuntsi.

HIV prevalence was calculated using direct standardization as follows:

An estimate of female HIV prevalence for each district and Botswana as a whole was calculated using direct standardization as follows: (Appendix 8.6.a):

A) Estimating female HIV prevalence for each district and Botswana

- The exact female population for each district in the 6 age groups of interest (15-19 years, 20-24 years, 25-29 years, 30-34 years, 35-39 years, and 40-49) was obtained from the 2001 national census data (Appendix 8.6.a - yellow columns).
- HIV prevalence was calculated for each of the 22 districts by age group, using 2003 Botswana Sentinel Surveillance data. For Gantsi 2001 and 2002 data were combined to estimate 2003 prevalence.
- This age-specific prevalence was then multiplied by the corresponding age and district-specific population to determine the number of infected women in each age category by district.
- The sum of the number of infected women for all age groups and districts yielded the total infected

women 15-49 years in Botswana

- This number of infected women was divided by the total female population for each age group by district to provide an adjusted district HIV prevalence
- The adjusted national prevalence was then calculated by dividing the total number of infected women for all districts divided by the total female population 15-49 years in Botswana. Robust variances obtained from logistic regression models were used to calculate the 95% CI for the adjusted prevalence

NOTE: Statistical comparisons of HIV prevalence exclude Gantsi in determining p-values.

B) Estimate of the total number of HIV infection among males 15-49 years old

- The exact male population for each district in the 6 age groups of interest (15-19 years, 20-24 years, 25-29 years, 30-34 years, 35-39 years, and 40-49) was obtained from the 2001 national census data (Appendix 8.6.b).
- The age-specific HIV prevalence from the 2003 survey for each of the six age groups in pregnant women in each of the 22 districts was used as the starting point.
- This prevalence was then multiplied by a male to female infection ratio correction factor, i.e. the combined male-to-female HIV infection ratios obtained from the Tebelopele Stand Alone VCT and integrated VCT from health facilities.
- This "corrected" prevalence was then multiplied by the 2003 (15-49 years old) male population to determine the number of infected men per district.

C) Estimate of the total number of infections (both males and females)

A correction factor for females and males, reflecting the natural increase in population from 2001 to 2003,

was applied to this number. The correction factor for women was 2.5% per year and for men was 2.6% per year.

The addition of the number of infected females and infected males gave the total number of infected persons (age 15-49) in Botswana.

D) HIV Prevalence Trends

For sentinel surveys conducted from 1992 to 1999, crude estimates of prevalence were calculated and included women from non-consistant health districts except for Francistown and Gaborone. Raw data from surveys from 1992 to 1999 were not available to recompute the adjusted prevalences. The 2000 survey included 6 health districts and women aged 15 to 49 years. From 2001 to 2003, surveys included women from all 22 health districts and of ages 15 to 49. For comparisons of HIV prevalence for various age groups that are made over time the following was done:

- 1) The prevalence for women aged 15-19 and aged 20-24 for 1992 to 2000 are crude estimates. Prevalence for women aged 15-19 and aged 20-24 for 2001 to 2003 are district adjusted estimates.
- 2) For comparison of the young age groups to older women, prevalence for women 25-49 are presented. The prevalence for women aged 25-49 for 1992 to 2000 are based on data for ages 25-44. Estimates are adjusted to the age distribution of Botswana in 2001 and for 2001 to 2003 are age and district adjusted.

3.1.11 Assumptions in estimations

The assumptions made by the data management team were as follows:

Females:

The HIV prevalence among pregnant women aged

15-49 years attending public antenatal clinics in a district is representative of the HIV prevalence among all pregnant women in the same age group in that district.

The HIV prevalence among pregnant women 15-49 years in a district is representative of the HIV prevalence among women of the same age group in that district.

The rate of natural increase in the female population remained fairly stable over the two-year period 2002-2003.

Males:

Male-to-female HIV infection ratios of the first time attendees at both stand-alone (Tebelopele) and integrated Voluntary Counseling and Testing (VCT) centers in Health facilities are representative of the male-to-female infection ratios in the general population.

The following male-to-female prevalence ratios were used:

Age Group	Prevalence Correction Ratio
15-19	0.08
20-24	0.30
25-29	0.56
30-34	0.82
35-39	1.05
40-49	1.24

The rate of natural increase in the male population remained fairly stable over the two-year period 2002-2003.

3.1.12 Limitations

The 2003 HIV sentinel surveillance had the following limitations:

- The WHO guidelines recommend working with a health facility as a sentinel site. In the Botswana context, however, several satellite sites needed to be combined to achieve the required sample size.
- The WHO recommended minimum sample size of 250 was not feasible for some districts. The sample sizes obtained for each district had a wide range. Hence, the HIV prevalence estimates of the respective districts have varying degrees of accuracy, which might affect the accuracy of the national summary estimate.
- Data from Gantsi collected in 2003 was excluded from analysis for two main reasons. Out of the 91 samples retested by an independent QA laboratory, 28 (31%) yielded discordant results. Furthermore, a comparison of the results for this year with that of last year indicate that HIV prevalence in the district has doubled within this interval. From the general pattern observed in all the other districts, and from epidemiological point of view, this doubling in prevalence in one year seemed an unlikely occurrence. For these reasons, data from this district was excluded from the analysis. In making national estimates for the number of infections in the country, the prevalence used for this District was the weighted mean of the 2001 and the 2002 prevalence.
- Projected population figures for 2003 by age groups were not available. Therefore the correction factor reflecting population increase applied uniformly to all age groups might have differed from the actual.

3.2 DRUG-RESISTANCE AMONG HIV-1C INFECTED, TREATMENT-NAIVE ADULTS IN BOTSWANA

In order to evaluate the prevalence of drug resistance on a population level prior to the initiation of Botswana's public national ARV treatment program (background baseline resistance), samples from the 2001 HIV Sentinel Surveillance were analysed for baseline drug resistance of HIV-1C by genotyping a representative number of samples from the northern and the southern part of the country (71 samples in total) and key results are summarized in Table 13. Viral genotyping was performed by using ViroSeq HIV-1 Genotyping System (Celera Diagnostics (former Applied Biosystems, Inc. (ABI)), Alameda, CA), according to the manufacturer's instructions. Briefly, HIV-1 RNA was extracted from viral particles pelleted from plasma by isopropanol/ethanol precipitation, convert-

ed to cDNA and then amplified in PCR. The amplicon (~ 1500 bp) represented the HIV-1 pol region spanning the entire protease and the first 335 codons of RT. The PCR product was then sequenced (both strands) using 6 different primers and Big Dye chemistry on an ABI 3100 Genetic Analyser. ViroSeq HIV Analysis software was used for assembling and editing the sequences. The software compares the sample sequence with HXB2 and identifies mutations known to be associated with resistance to the different drugs. The Stanford HIV resistance database was also used to analyze for resistance mutations. This database includes more recently identified resistance mutations compared to the Viroseq Software.(2000).

3.3 CD4 CELL COUNTS AMONG HIV-NEGATIVE BOTSWANA

Samples from the Botswana 2001 HIV Sentinel Surveillance survey were used to describe CD4+ lymphocyte reference ranges. In total, 589 Sentinel Surveillance samples were collected, and of these 499 were suitable for T-lymphocyte subset enumeration of which 251 (50%) were HIV-negative. Unlysed, whole blood samples were collected in EDTA (Becton Dickinson) to prevent clotting. Blood samples were collected in the morning and were transported to the National HIV Reference Laboratory at ambient temperature. Only samples that arrived at the laboratory within 24 hours of collection were analyzed.

HIV-1 screening of all samples was performed by par-

allel ELISA testing using Murex HIV 1.2.0 (Abbott Pharmaceuticals, Inc.) and Ortho HIV-1/HIV-2 AB-Capture ELISA Test System (Ortho-Clinical Diagnostics, Inc) assays to detect the presence of HIV-1 and HIV-2 antibodies.

FACSCCount System (Becton Dickinson) was used to enumerate absolute values for CD4 (helper/ inducer T lymphocytes) and CD8 (suppressor/ cytotoxic T lymphocytes) as well as CD4+ to CD8+ ratios for each sample. The FACSCCount instrument used for this study was validated against two independent FACSCCount Systems.

3.4 TEBELOPELE HIV VOLUNTARY COUNSELING AND TESTING (VCT) PROGRAM

The main objective of this program is to establish a network of 16 free standing Tebelopele VCT centers in Botswana. Secondary objectives include the mobilization of the community in support of VCT and behavior change, establishing a network for referral procedures for clients, and discouraging stigmatization of HIV/AIDS. The first centre was opened in April 2000 and currently 16 centres are operational. Several centers have established satellite as well as mobile testing sites. At all centers, qualified and trained personnel provide HIV voluntary counseling (pre and post) and testing with same-day test results.

An algorithm consisting of two rapid immunoassays tests is used to test the whole blood for HIV antibodies. In case of discordant results, a third rapid test is

used as a tiebreaker or the specimen is re-tested by double ELISA algorithm. The Ministry of Health has validated the rapid test kit algorithm. A standard form is completed for all clients who visit the center regardless first or second visit (Appendix 8.7).

Anonymous information is collected on socio-demographics, occupation, number of sexual partners, condom use, clinical symptoms, and a few other characteristics of interest. Clients go through an extensive post-counseling session with the development of a risk reduction plan. HIV sero-positive persons are referred to appropriate clinics and/or organizations for follow-up and support (Isoniazid preventive therapy, ARV evaluation, mother-to-child transmission for pregnant women, associations of People living with AIDS).

3.5 HIV/AIDS CASE REPORTING AND MORTALITY DATA

A standardized HIV request form (Appendix 8.8) is used in the country to report HIV and AIDS cases from health facilities. The form captures information on demographic characteristics, reasons for testing, presenting symptoms, and exposure to specific risk factors. Clinicians complete the form for various service reasons: voluntary counseling, Prevention of Mother to Child Transmission (PMTCT), rape, injury, and clinical suspect cases. Forms are routinely completed at the health facility and sent to the Ministry of Health

(MOH) on a monthly basis. The AIDS case definition used in the country as well as for this data analysis is the Abidjan definition (Appendix 8.9 Bangui definition plus a confirmatory HIV laboratory test).

The crude mortality data are analyzed from the facility inpatient deaths within public health delivery system. Sources of these data were the annual Central Statistics Office Vital Statistics reports 1995-2002.

3.6 PREVENTION OF MOTHER TO CHILD TRANSMISSION (PMTCT)

In Botswana, staff at the health facilities maintains logbooks with aggregate PMTCT programme data. Information collected includes amongst others, numbers of ANC attendance, number of pregnant women counseled and tested for HIV, number of HIV positive women, provision of AZT, Nevirapine, and

infant formula as replacement feeding. Women consenting for HIV testing complete the standardized HIV request form mentioned above. This form together with the blood sample is forwarded to the respective district laboratories where it will be tested by parallel ELISA.

3.7 BEHAVIOURAL SURVEYS

The behavioural data used in this report is based on the Makgabaneng radio drama listenership survey. Makgabaneng is a weekly, nationally broadcast entertainment-education radio serial drama first aired in 2001 to support HIV prevention efforts in Botswana. It is written and produced by Botswana with support from the U.S. Centers for Disease Control and Prevention, Media Support Solutions, and the Government of Botswana's Ministry of Information and Broadcasting.

To assess listenership, a random sample of 1730 households was selected from seven districts: Ngami, Serowe/Palapye, Southern, Francistown, Kgatleng, Selebi Phikwe, and Gaborone. 60 clusters (enumeration areas or EAs) were selected from these seven districts with the number of EAs per district

proportional to the population size. 30 households were randomly selected per EA, and one 15-49 year old, Setswana-speaking household member was randomly selected per household and approached for interview. Protocol and questionnaires were submitted and cleared by Institutional ethical review boards in Botswana and the United States. Interviewers were trained for 2 weeks and 3 pilot tests were conducted before the 4 teams started fieldwork. Data was collected between February and May 2003. Interviews were sex-matched. The survey instrument included questions about radio-listening patterns, response to Makgabaneng, knowledge and psychosocial measures related to HIV/AIDS, sexual behavior, VCT, PMTCT, and stigma towards those infected.

3.8 DATA ON SEXUALLY TRANSMITTED INFECTIONS

In Botswana, the STI program is based on the syndromic management approach. The STI data were

derived from the CSO Health statistics reports 1995-2000.

3.9 DATA ON TUBERCULOSIS

The Botswana National TB program reports all diagnosed cases including pulmonary Tuberculosis (PTB) cases that were not confirmed by positive sputum results and all cases of extra pulmonary tuberculosis (EPTB). The reporting system follows the International Union Against Tuberculosis and Lung Disease/WHO guidelines for TB recording and reporting.

Most of the case finding for tuberculosis is done passively. Patients present voluntarily to facilities. A diagnosis of TB is suspected on the basis of symptoms and clinical findings. Screening of tuberculosis is done by all health workers in the different facilities. Sputum is usually the first investigation to be carried out. Other diagnostic procedures such as

chest x-ray, blood FBC and ESR are also done. Each facility keeps a register of TB cases (Appendix 8.10). These forms are submitted to the DHT on a monthly basis. The DHT collates this information in a user-friendly menu driven computer program using a DOS based software (Epi-Info 6).

The desk review was done using the following documents:

- The Global Plan to Stop Tuberculosis.
- The Tuberculosis Statistics-2002 in Botswana.
- Evaluation of the Botswana National Tuberculosis (TB) Programme 1999.
- National Tuberculosis Control Programme Report of 2002.

4. RESULTS

4.1. HIV SENTINEL SURVEILLANCE

Table 1: Enrollment and completeness of information, pregnant women, 2003 Sentinel Surveillance, Botswana.

Sentinel Site	Enrolled	Forms no result	Result no form	Unusable for	Used for analysis	
	No.		No.	other reasons*	No.	%
Ngami	403	6	5	16	376	93%
North East	233	0	6	5	222	95%
Serowe/Palapye	423	6	14	14	389	92%
Bobirwa	266	0	6	5	255	96%
Kweneng East	555	12	8	13	522	94%
Southern	437	62	6	10	359	82%
Gantsi	195	3	10	182	0	0%
Mahalapye	394	8	47	13	326	83%
Kgatleng	369	5	2	9	353	96%
Chobe	121	3	1	2	115	95%
Kgalagadi	170	2	2	5	161	95%
Tutume	454	6	10	9	429	94%
Boteti	318	12	11	35	260	82%
Okavango	352	10	3	11	328	93%
Gaborone	577	6	8	8	555	96%
Francistown	647	10	5	39	593	92%
South East	317	1	1	9	306	97%
Lobatse	251	2	0	3	246	98%
Selebi Phikwe	321	10	0	9	302	94%
Kweneng West	198	7	0	1	190	96%
Goodhope	146	4	2	3	137	94%
Hukuntsi	104	2	0	2	100	96%
Total	7251	177	147	403	6524	90%

*44 women had hemolyzed specimen and could not be tested, 48 had an interview date outside the survey, 96 were younger than 15 or older than 49, 168 for high discordance, and 47 for other reasons.

A total of 7,251 women were enrolled in the 2003 survey out of which 6,524 or 90% (median of 304 per district, range 0 – 593) were eligible for inclusion in the analysis. The other 727 were excluded from the analysis for various reasons such as missing results (24%), missing forms (20%), hemolyzed specimens (6%), failure to meet the specified age and date inclusion criteria (20%), unusually high discordance rates (23%) or other reasons (6%). All districts enrolled at least 100 women.

Table 2: Socio-demographic characteristics of women enrolled in the 2003 Sentinel Surveillance, Botswana.

Characteristic	N	%
Age group (n=6524)		
15-19	1150	17.6
20-24	2289	35.1
25-29	1449	22.2
30-34	867	13.3
35-39	514	7.9
40-49	255	3.9
Marital status (n=6457)		
Living together	445	6.9
Married	770	11.9
Single	5242	81.2
Educational level (n=6469)		
None	483	7.5
Primary	1459	22.6
Secondary	4290	66.3
University	237	3.7
Employment status (n=6487)		
Regular job	1357	20.9
Self-employed	238	3.7
Temporary jobs	546	8.4
Unemployed	4346	67.0
Occupation (n=6384)		
Domestic worker	1403	22.0
Office worker	716	11.2
Student	569	8.9
Other	3696	57.9
Number of pregnancies (n=6524)		
1	2276	34.9
2 to 3	2825	43.3
>3	1423	21.8

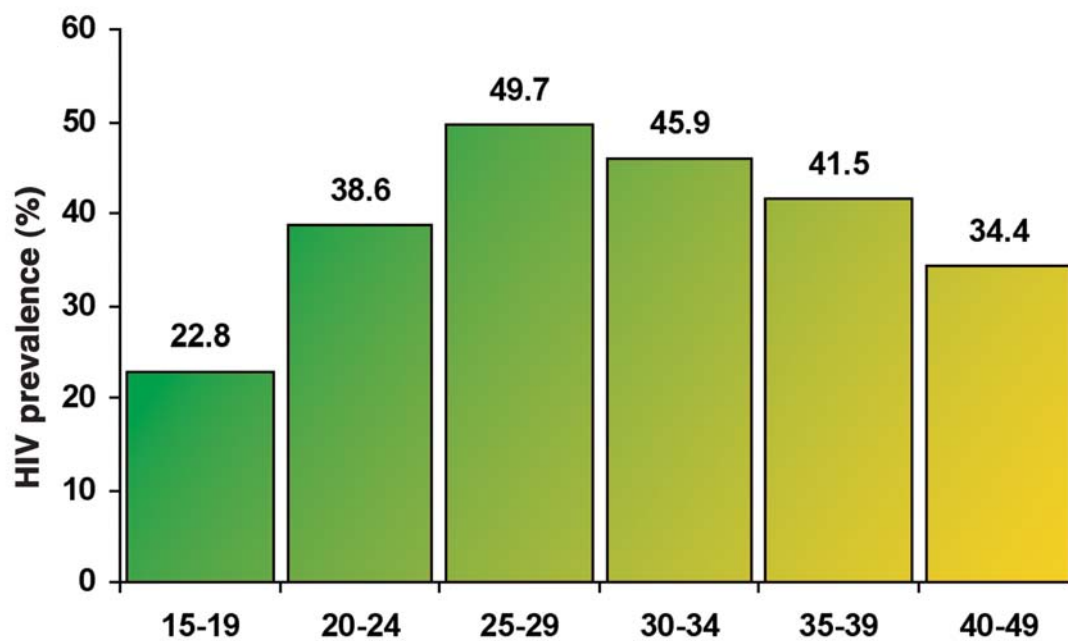
The mean age of the women was 25.6 years (median 24 years); 18% of the women surveyed were younger than 20 years of age and 35% of women were 20-24 years of age. Over 80% of the women were single. Close to 8% of the women had received no formal education and approximately two-thirds of them were unemployed. The most frequent single occupation cited by the women was domestic worker. Students comprised 9% of the group. For about a third of the women, this was their first pregnancy.

Table 3: Results of laboratory quality assurance, pregnant women, Botswana 2003 HIV Sentinel Surveillance

Laboratory	Number of results used in analysis	Number of specimen re-tested	% of total laboratory specimens	Discordance		
				No.	%	95% CI
Athlone Laboratory	246	190	77.2	26	13.7	9.1-19.4
Gweta Primary Hospital Laboratory	63	9	14.3	1	11.1	0.3-48.2
Tutume Primary Hospital Laboratory	366	0	0.0	na	na	na
Gantsi Hospital Laboratory *	169	91	53.8	28	30.8	21.5-41.3
Mahalapye Hospital Laboratory	225	187	83.1	10	5.3	2.6-9.6
Sefhare Laboratory	72	7	9.7	1	14.3	0.4-57.9
Hukuntsi Primary Hospital Lab	100	16	16.0	2	12.5	1.6-38.3
DRM Hospital Laboratory	349	158	45.3	11	7.0	3.5-12.2
Masunga Primary Hospital	222	0	0.0	na	na	na
Rakops Primary Hospital	70	0	0.0	na	na	na
Scottish Livingstone Hospital Lab	578	95	16.4	9	9.5	4.4-17.2
Thamaga Primary Hospital Lab	134	17	12.7	2	11.8	1.5-36.4
Selebi Phikwe Government Hospital	302	271	89.7	44	16.2	12.1-21.2
National Blood Transfusion Lab	3212	453	14.1	38	8.4	6.0-11.3
Bobonong Lab	185	26	14.1	2	7.7	0.9-25.1
Bamalete Lutheran Lab	74	10	13.5	0	0.0	0.0-30.8
Lethakane Hospital Lab	190	0	0.0	na	na	na
GoodHope Hospital Lab	136	11	8.1	1	9.1	0.2-41.3
Total excluding Gantsi*	6524	1450	22.2	147	10.1	8.6-11.8

* Not used in the analysis

The independent National HIV Reference Laboratory (B.H.P.) re-tested 1450 (22%) of the 6523 specimens collected for the survey for which we had results and demographics. Overall, 175 specimens gave discordant results. One laboratory (Gantsi Hospital laboratory) gave an unusually high discordance rate of 31% and the site was subsequently excluded from the analysis. The overall discordance rate excluding Gantsi was 10%.

Figure 1: Age- specific seroprevalence of HIV among Botswana pregnant women, 2003 HIV Sentinel Survey

The highest HIV prevalence is consistently in the 25-29 year age group in which prevalence has been at approximately 50% for the past three years. The lowest rates are among women aged 15-19 years.

Table 4: HIV prevalence according to reported marital status, pregnant women, 2003 Sentinel Surveillance, Botswana.

Sentinel Site	Single		Married		Living Together		Total No.
	No.	% Pos	No.	% Pos	No.	% Pos	
Ngami	293	36.2	53	39.6	26	61.5	372
North East	177	44.6	31	22.6	11	63.6	219
Serowe/Palapye	313	47.0	54	31.5	17	64.7	384
Bobirwa	215	56.7	24	41.7	14	57.1	253
Kweneng East	428	33.4	63	22.2	27	55.6	518
Southern	297	26.9	40	22.5	16	43.8	353
Mahalapye	275	42.5	31	16.1	18	33.3	324
Kgatlang	308	31.2	32	37.5	12	58.3	352
Chobe	101	53.5	11	18.2	2	0.0	114
Kgalagadi	138	30.4	12	33.3	10	50.0	160
Tutume	333	43.2	71	22.5	19	47.4	423
Boteti	204	36.8	37	43.2	15	53.3	256
Okavango	244	34.4	39	33.3	43	39.5	326
Gaborone	475	45.9	59	37.3	20	65.0	554
Francistown	460	49.8	65	18.5	62	54.8	587
South East	205	29.3	50	20.0	46	23.9	301
Lobatse	196	34.7	20	15.0	25	36.0	241
Selebi Phikwe	248	54.4	31	38.7	19	73.7	298
Kweneng West	140	30.0	27	14.8	20	15.0	187
Goodhope	116	37.1	9	22.2	11	63.6	136
Hukuntsi	76	32.9	11	27.3	12	25.0	99
Total	5242	40.2	770	27.8	445	47.2	6457
%	81.2		11.9		6.9		

11 women were divorced, 10 separated, 28 were widowed and 18 did not answer.

HIV prevalence differed by marital status. Overall HIV prevalence was highest among unmarried women living together with partners (range: 0.0% in Chobe to 73.7% in Selebi-Phikwe) compared to those who were married. HIV prevalence was also consistently higher among single women (range: 26.9% in Southern to 56.7% in Bobirwa) than those who were married (range: 14.8% in Kweneng West to 43.2% in Boteti) for all districts except for Ngami, Kgatleng, Kgalagadi, and Boteti.

Table 5: HIV prevalence according to education, pregnant women, 2003 Sentinel Surveillance, Botswana.

Sentinel Site	None		Primary		Secondary		University		Total NO.
	No.	% Pos	No.	% Pos	No.	% Pos	No.	% Pos	
Ngami	32	53.1	90	38.9	246	36.6	7	14.3	375
North East	17	35.3	58	46.6	143	42.7	4	25.0	222
Serowe/Palapye	27	55.6	86	53.5	255	44.7	16	6.3	384
Bobirwa	18	61.1	66	53.0	158	55.1	11	63.6	253
Kweneng East	28	21.4	117	40.2	349	32.7	19	21.1	513
Southern	28	14.3	78	34.6	238	26.5	12	25.0	356
Mahalapye	17	47.1	83	39.8	216	40.3	7	28.6	323
Kgatleng	12	33.3	67	49.3	265	28.7	9	33.3	353
Chobe	5	40.0	33	63.6	76	43.4	1	0.0	115
Kgalagadi	17	29.4	50	32.0	92	32.6	2	0.0	161
Tutume	40	15.0	117	45.3	258	42.2	10	20.0	425
Boteti	35	25.7	46	47.8	159	39.0	18	33.3	258
Okavango	71	23.9	120	44.2	135	31.9	1	100.0	327
Gaborone	19	52.6	73	53.4	436	45.6	24	16.7	552
Francistown	19	36.8	92	52.2	454	46.7	21	38.1	586
South East	10	40.0	50	40.0	212	24.5	33	24.2	305
Lobatse	10	50.0	43	41.9	168	31.5	20	25.0	241
Selebi Phikwe	17	58.8	49	63.3	222	52.7	12	25.0	300
Kweneng West	39	38.5	70	32.9	79	16.5	1	0.0	189
Goodhope	14	14.3	40	35.0	79	43.0	3	100.0	136
Hukuntsi	8	37.5	31	35.5	50	30.0	6	16.7	95
Total	483	34.4	1459	44.7	4290	38.8	237	26.6	6469
%	7.5		22.6		66.3		3.7		

For 55 women, educational background could not be determined.

There was no consistent pattern of relationship between level of education and HIV prevalence. It appears however that those with primary education generally had higher rates than their counterparts. The sample sizes for respondents with university level of education in all, but one district was very small (less than 30).

Table 6: HIV prevalence by employment status, pregnant women, 2003 Sentinel Surveillance, Botswana

Sentinel Site	Unemployed		Regular Job		Temporary Job		Self Employed		Total
	No.	% Pos	No.	% Pos	No.	% Pos	No.	% Pos	No.
Ngami	276	39.5	64	34.4	19	42.1	13	30.8	372
North East	133	35.3	42	52.4	40	55.0	7	57.1	222
Serowe/Palapye	271	48.3	73	41.1	30	46.7	12	33.3	386
Bobirwa	195	52.8	34	67.6	21	61.9	4	50.0	254
Kweneng East	367	33.0	89	31.5	43	32.6	20	40.0	519
Southern	253	25.7	62	33.9	32	31.3	10	30.0	357
Mahalapye	226	36.3	46	43.5	29	37.9	20	65.0	321
Kgatleng	224	32.6	78	32.1	37	35.1	14	35.7	353
Chobe	63	55.6	41	43.9	9	33.3	2	0.0	115
Kgalagadi	114	31.6	16	37.5	25	32.0	5	20.0	160
Tutume	315	39.0	65	41.5	35	45.7	14	35.7	429
Boteti	170	34.7	52	30.8	27	55.6	10	90.0	259
Okavango	271	33.9	27	48.1	21	33.3	8	37.5	327
Gaborone	298	45.0	214	45.8	20	30.0	22	63.6	554
Francistown	360	44.7	160	50.0	36	50.0	32	53.1	588
South East	152	29.6	105	21.9	34	35.3	14	28.6	305
Lobatse	151	33.8	69	31.9	20	40.0	6	33.3	246
Selebi Phikwe	193	48.7	76	59.2	17	70.6	11	63.6	297
Kweneng West	149	26.8	6	16.7	34	29.4	1	0.0	190
Goodhope	101	38.6	17	47.1	13	46.2	6	0.0	137
Hukuntsi	64	28.1	21	28.6	4	75.0	7	28.6	96
Total	4346	38.2	1357	40.8	546	41.9	238	45.0	6487
%	67.0		20.9		8.4		3.7		

37 women did not reveal their employment status.

There was little variation in HIV prevalence between employment categories. In five districts, HIV prevalence was highest among those with regular employment compared with those in other employment categories. In seven other districts, HIV prevalence was highest among those self-employed.

Table 7: HIV prevalence according to occupation, pregnant women, 2003 Sentinel Surveillance, Botswana.

Sentinel Site	Domestic Worker		Student		Office worker		Other		Total
	No.	% Pos	No.	% Pos	No.	% Pos	No.	% Pos	No.
Ngami	64	48.4	43	27.9	40	32.5	224	38.4	371
North East	44	43.2	33	27.3	22	36.4	118	47.5	217
Serowe/Palapye	81	55.6	43	48.8	40	42.5	220	43.2	384
Bobirwa	42	61.9	27	40.7	16	62.5	167	55.1	252
Kweneng East	128	33.6	38	13.2	56	25.0	291	37.1	513
Southern	82	35.4	31	12.9	39	30.8	199	26.1	351
Mahalapye	82	47.6	21	19.0	21	47.6	196	38.8	320
Kgatleng	75	46.7	27	11.1	44	38.6	196	30.1	342
Chobe	37	59.5	6	66.7	16	43.8	54	40.7	113
Kgalagadi	46	34.8	11	18.2	8	37.5	92	31.5	157
Tutume	121	47.9	27	29.6	29	31.0	249	38.2	426
Boteti	81	40.7	11	0.0	26	30.8	133	42.1	251
Okavango	40	32.5	40	17.5	15	46.7	232	37.9	327
Gaborone	71	36.6	39	23.1	112	42.9	312	51.0	534
Francistown	110	48.2	67	34.3	67	52.2	339	47.5	583
South East	56	19.6	34	14.7	68	23.5	146	34.9	304
Lobatse	40	32.5	21	19.0	37	21.6	136	39.0	234
Selebi Phikwe	69	52.2	30	43.3	35	60.0	162	54.3	296
Kweneng West	64	29.7	6	16.7	3	0.0	108	25.9	181
Goodhope	48	33.3	9	33.3	10	50.0	65	41.5	132
Hukuntsi	22	18.2	5	40.0	12	33.3	57	29.8	96
Total	1403	41.8	569	26.4	716	38.0	3696	40.5	6384
%	22.0		8.9		11.2		57.9		

140 women did not reveal their occupation.

In seven of the districts, HIV prevalence was highest among domestic workers, ranging from 18.2% in Hukuntsi to 61.9% in Bobirwa. Students had the lowest prevalence (range: 0.0% in Boteti to 66.7% in Chobe). The association between HIV prevalence and occupation is confounded by age. Students tend to be younger and younger people have lower prevalence. When adjusted for age group, office workers rather than students have the lowest prevalence.

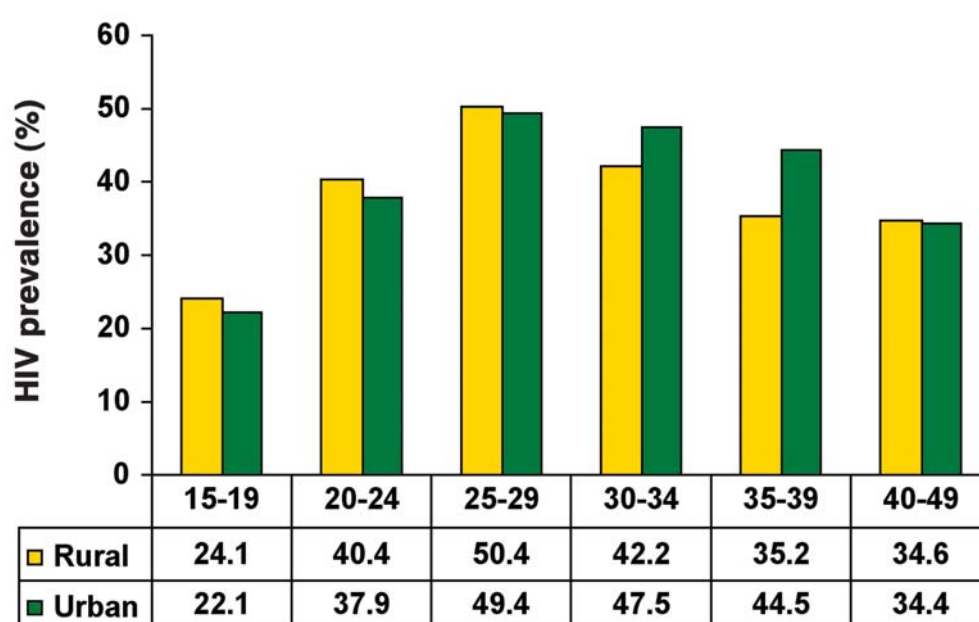
Table 8: HIV prevalence according to number of pregnancies, 2003 Sentinel Surveillance, Botswana.

Sentinel Site	First pregnancy		2-3 pregnancy		>3 pregnancy		Total No.
	No.	% Pos	No.	% Pos	No.	% Pos	
Ngami	121	28.9	173	40.5	82	47.6	376
North East	73	28.8	96	57.3	53	35.8	222
Serowe/Palapye	126	42.1	167	47.9	96	47.9	389
Bobirwa	69	46.4	106	66.0	80	48.8	255
Kweneng East	222	24.3	201	44.3	99	30.3	522
Southern	131	20.6	147	35.4	81	24.7	359
Mahalapye	106	30.2	144	46.5	76	40.8	326
Kgatleng	141	24.1	139	41.0	73	34.2	353
Chobe	42	26.2	48	62.5	25	60.0	115
Kgalagadi	51	17.6	63	39.7	47	36.2	161
Tutume	127	28.3	193	46.6	109	41.3	429
Boteti	81	34.6	124	44.4	55	30.9	260
Okavango	99	28.3	127	41.7	102	33.3	328
Gaborone	214	27.1	272	58.1	69	53.6	555
Francistown	221	34.4	252	53.6	120	55.8	593
South East	116	16.4	132	36.4	58	29.3	306
Lobatse	89	21.3	107	43.0	50	36.0	246
Selebi Phikwe	109	47.7	148	59.5	45	51.1	302
Kweneng West	64	12.5	75	37.3	51	29.4	190
Goodhope	54	37.0	53	41.5	30	36.7	137
Hukuntsi	20	20.0	58	34.5	22	31.8	100.0
Total	2276	28.8	2825	47.4	1423	40.2	6524
%	34.9		43.3		21.8		

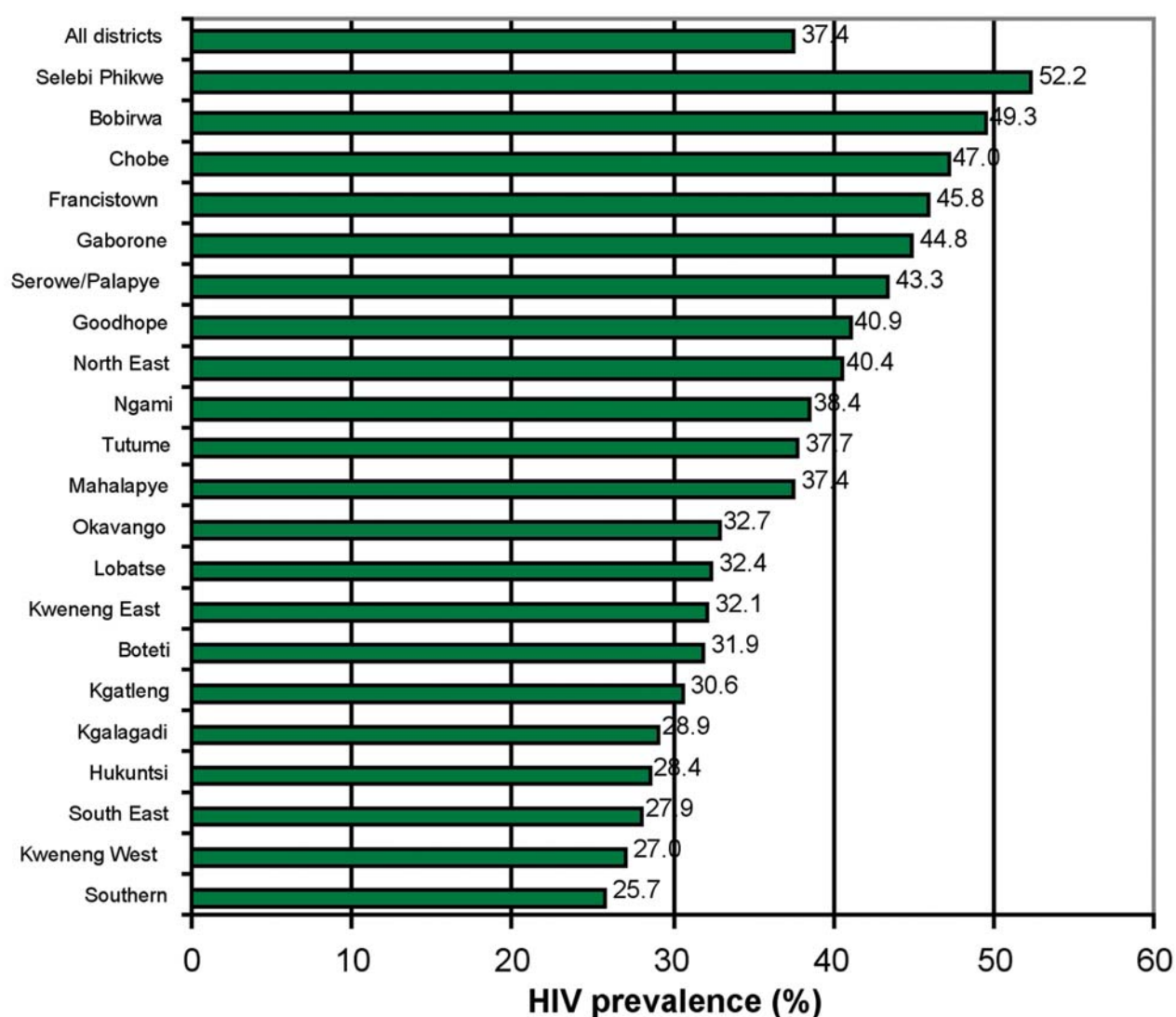
The mean number of pregnancies was 2.5 (range 1 - 13); the median number was 2.

The prevalence of HIV was consistently higher in women with two to three pregnancies (range: 34.5% in Hukuntsi to 66.0% in Bobirwa) than in women with a first pregnancy (range 12.5% in Kweneng West to 47.7% in Selebi Phikwe). Women with two or three pregnancies generally had higher HIV prevalence than women with more than 3 pregnancies (range 24.7% in Southern to 60.0% in Chobe).

Figure 2: Adjusted HIV prevalence by residence and age, pregnant women, 2003 Sentinel Surveillance, Botswana.

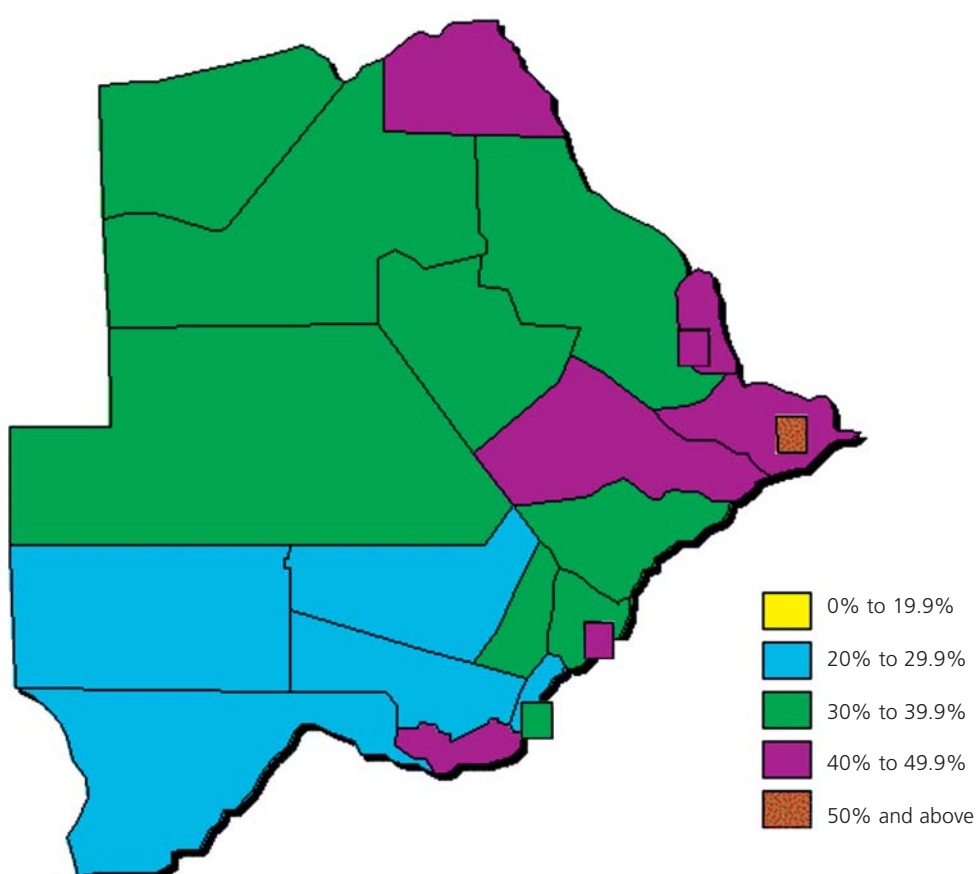


The prevalence of HIV infection is essentially the same in urban and rural areas. Women with rural residence had an overall prevalence of 36.5% compared to 37.9% prevalence for women with urban residence. In the three youngest age groups, women in rural areas had higher HIV prevalence than those in urban areas. In both urban and rural areas, HIV prevalence was highest among women in the 25-29 year age group.

Figure 3: Adjusted HIV prevalence in pregnant women by district, 2003 Sentinel Surveillance, Botswana.

Age-adjusted HIV prevalence by district is shown in Figure 3. The prevalence in the 22 districts ranged from 25.7% in Southern to 52.2% in Selebi Phikwe. Five districts had prevalence between 25% and 30%, eight districts between 30% and 40%, and for eight districts, the prevalence was greater than 40%.

Figure 4: HIV prevalence distribution by district, 2003 Sentinel Surveillance, pregnant women, Botswana.



The prevalence of HIV was higher in northern and north eastern parts of the country than the southern and western districts. Notably, northern border districts were worst affected than all other districts (Figure 4).

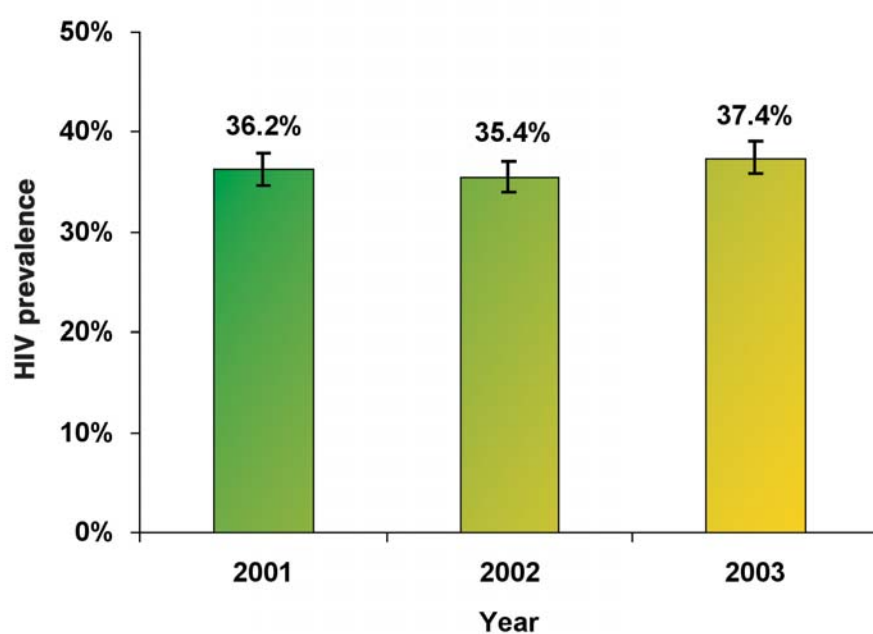
Table 9: Comparison of 2001, 2002, and 2003 HIV prevalence by district, pregnant women, 2003 Sentinel Surveillance, Botswana.

District	All Ages **					
	2001		2002		2003	
	HIV+/N	% (95CI)	HIV+/N	% (95CI)	HIV+/N	% (95CI)
Ngami	137/372	35.8 (30.0, 41.6)	111/253	40.7 (33.6, 47.7)	144/376	38.4(32.6,44.2)
North East	30/75	39.7 (26.8, 52.6)	83/196	38.6 (30.9, 46.4)	95/222	40.4(32.2,48.5)
Serowe/Palapye	150/337	40.3 (33.8, 46.8)	156/425	35.2 (27.8, 42.6)	179/389	43.3(37.7,49.0)
Bobirwa	66/148	43.7 (33.3, 54.0)	142/286	45.3 (38.3, 52.2)	141/255	49.3(41.7,57.0)
Kweneng East	175/537	29.5 (25.3, 33.7)	189/567	29.2 (25.0, 33.3)	173/522	32.1(26.8,37.5)
Southern	117/343	30.3 (24.5, 36.2)	120/363	30.5 (24.6, 36.5)	99/359	25.7(20.1,31.3)
Gantsi	39/147	21.9 (15.0, 28.8)	24/112	18.8 (11.2, 26.5)	na	na
Mahalapye	114/326	30.6 (25.0, 36.2)	130/303	39.8 (33.7, 46.0)	130/326	37.4(31.2,43.6)
Kgatleng	71/227	24.2 (17.6, 30.8)	106/310	30.9 (22.8, 39.1)	116/353	30.6(25.0,36.1)
Chobe	31/81	38.9 (25.6, 52.2)	45/105	38.4 (28.0, 48.7)	56/115	47.0(36.2,57.7)
Kgalagadi	41/118	28.3 (18.5, 38.2)	47/172	28.3 (17.9, 38.8)	51/161	28.9(21.4,36.5)
Tutume	134/261	50.0 (42.2, 57.8)	166/370	40.7 (34.6, 46.9)	171/429	37.7(31.6,43.9)
Boteti	110/265	36.4 (28.2, 44.6)	95/250	35.6 (27.0, 44.2)	100/260	31.9(24.5,39.3)
Okavango	74/206	39.2 (30.3, 48.0)	104/284	34.2 (28.3, 40.1)	115/328	32.7(27.4,38.1)
Gaborone	225/573	39.3 (33.6, 45.1)	260/666	38.2 (33.3, 43.0)	253/555	44.8(38.9,50.8)
Francistown	221/493	45.6 (40.1, 51.0)	190/458	40.2 (34.9, 45.5)	278/593	45.8(40.7,50.9)
South East	62/192	32.3 (23.5, 41.2)	87/288	26.5 (20.4, 32.5)	84/306	27.9(21.8,34.1)
Lobatse	77/230	30.9 (24.0, 37.8)	93/241	34.6 (27.3, 41.9)	83/246	32.4(25.2,39.7)
Selibe Phikwe	195/349	51.2 (45.0, 57.5)	193/372	48.1 (42.1, 54.1)	163/302	52.2(45.0,59.5)
Kweneng West	35/120	24.3 (15.8, 32.7)	49/158	28.7 (21.2, 36.1)	51/190	27.0(19.8,34.3)
Goodhope	36/95	30.0 (19.1, 40.9)	46/146	26.3 (18.7, 33.9)	53/137	40.9(24.4,57.3)
Hukunsi	15/59	23.2 (11.6, 34.9)	31/82	40.0 (26.7, 53.3)	31/100	28.4(16.8,39.9)
Adjusted Prevalence	2155/5554	36.2 (34.5, 37.9)	2467/6407	35.4 (33.9, 36.9)	2629/6783	37.4 (35.8, 39.0)**

* All prevalences are adjusted to the district-specific age distribution and overall prevalence is age and district adjusted.

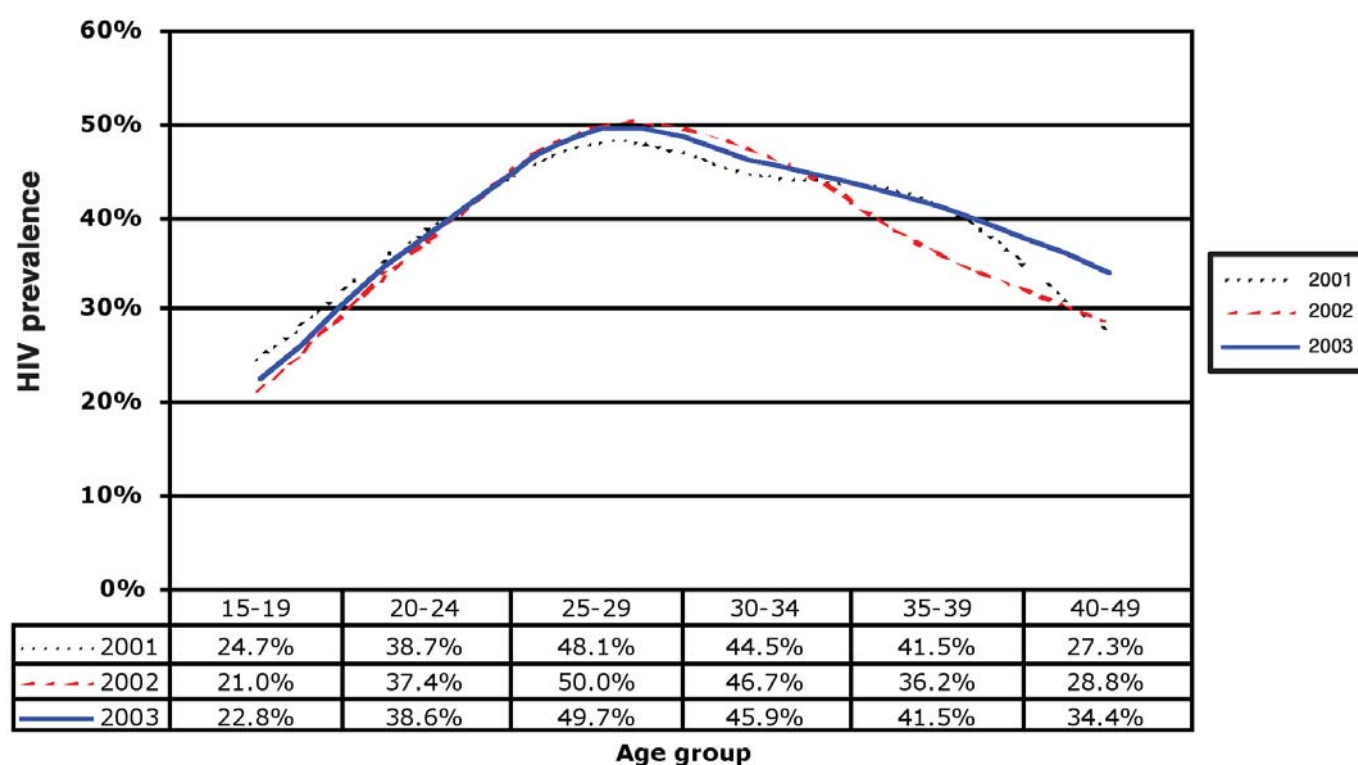
**For calculating overall adjusted prevalence, Gantsi's prevalence for 2003 was estimated by a weighted average of 2001 and 2002 prevalence.

Table 9 shows the age-specific and age group adjusted prevalence from the 2001, 2002, and 2003 surveys for women, all ages combined. Although prevalence increased from 35.4% to 37.4% between 2002 and 2003, the trend over the three year period is relatively stable and does not show a significant increase ($p=0.22$).

Figure 5: Adjusted HIV Prevalence Trends, 2001 – 2003 Sentinel Surveillance, Botswana.

Sentinel surveillance has been conducted in all 22 health districts since 2001. The 2001 census data were used to adjust prevalence for all three years. Comparisons across the three years indicate no significant differences ($p=0.22$). In addition, trend analysis for the three years also indicates that prevalence has remained fairly stable.

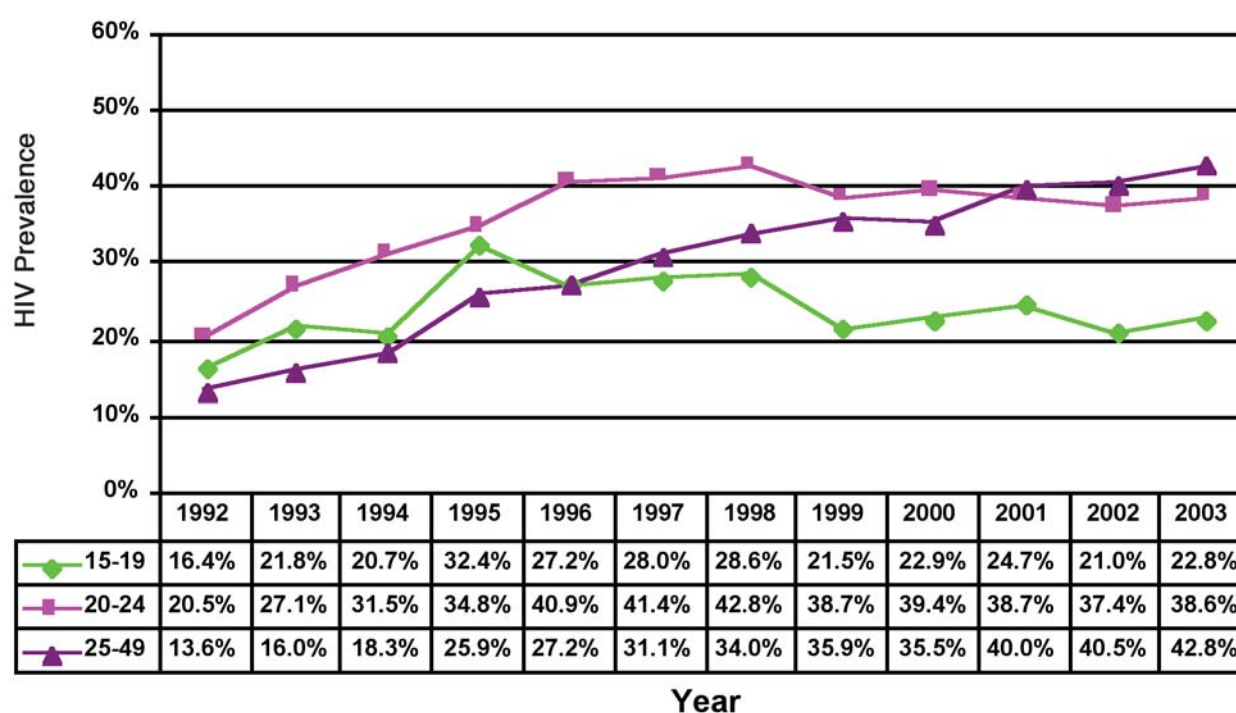
Figure 6: Age-specific HIV Prevalence Trends, 2001 – 2003 Sentinel Surveillance, Botswana.*



* Prior to 2001 not all 22 health districts were included in the sentinel surveillance survey. Standardization methods varied by year and age group (see methodology).

The highest HIV prevalence is consistently in the 25-29 year age group in which prevalence has been at approximately 50% for the past three years. The lowest rates are among women aged 15-19 years.

Figure 7: Trend in HIV prevalence among pregnant women by age group, Sentinel Surveillance 1992-2003, 2003 Sentinel Surveillance, Botswana.*



*Prior to 2001 not all 22 health districts and age groups were included in the sentinel surveillance survey. Standardization methods varied by year and age group (see methodology).

HIV prevalence in the 15 -19 year age group peaked in 1995, decreased over the next four years and has remained stable since 1999. For the 20-24 year old age group, HIV prevalence peaked in 1998, decreased the following year and has remained stable since 1999. There have been steady increases in the 25-49 year age group since 1992, although prevalence may be stabilizing over the past three years. The prevalence of HIV in the country had been increasing between 1992 and 1999. Between 2000 and 2003, the prevalence has remained relatively stable

Table 10: Estimated number of HIV infected adult females per health district and age group in Botswana, based on prevalences in pregnant women, 2003 Sentinel Surveillance, Botswana.

Sentinel Site	15-19 yrs	20-24 yrs	25-29 yrs	30-34 yrs	35-39 yrs	40-49 yrs	Total
Ngami	1,302	1,606	1,646	1,046	931	1,266	7,796
North East	897	1,037	897	568	470	969	4,838
Serowe/Palapye	3,496	3,193	3,130	2,648	2,757	2,106	17,331
Bobirwa	1,642	1,809	1,819	1,200	704	1,068	8,242
Kweneng East	2,119	4,177	3,966	2,031	1,835	3,553	17,681
Southern	1,085	1,742	2,061	1,913	1,012	1,742	9,555
Gantsi	272	578	360	373	87	125	1,793
Mahalapye	1,968	1,693	2,201	1,569	1,458	1,397	10,286
Kgatleng	854	1,104	1,396	1,080	1,016	598	6,047
Chobe	220	525	546	621	274	345	2,531
Kgalagadi	354	350	527	365	195	227	2,018
Tutume	2,091	2,062	2,148	1,451	1,273	2,221	11,246
Boteti	549	1,342	1,372	910	311	739	5,222
Okavango	827	1,018	1,097	562	517	466	4,486
Gaborone	2,145	6,586	7,515	5,983	4,441	4,064	30,735
Francistown	1,465	3,231	2,934	2,005	1,433	1,885	12,952
South East	852	800	1,017	1,032	773	917	5,391
Lobatse	344	672	815	622	450	423	3,325
Selebi/Phikwe	1,322	1,892	2,413	1,511	734	1,198	9,069
Kweneng West	254	437	669	274	521	483	2,638
Goodhope	846	630	744	415	726	1,157	4,518
Hukuntsi	65	241	321	167	171	209	1,174
Total of HIV infected women	24,967	36,724	39,594	28,342	22,088	27,157	178,873
% of N=178,873	14.0	20.5	22.1	15.8	12.3	15.2	100
Total of women in 2003 (denominator)	109,373	95,046	79,731	61,733	53,258	78,843	477,984

Age and district specific HIV rates were applied to the projected population in each age bracket per district.

2001 population data were provided by Central Statistics Office (CSO).

The estimated number of females 15 to 49 years who are HIV positive in Botswana is 178,873. Although, Selebi Phikwe had the highest HIV prevalence, the actual disease morbidity burden (in terms of number of infected women) is highest in Gaborone, Kweneng East, Serowe/Palapye, Francistown, and Tutume. Women in age group 15 to 24 years represent 34.5% of the total of adult women infected with HIV in Botswana.

Table 11: Estimated number of HIV infected adult males (15-49 years) per health district and age group, derived from 2003 prevalence data for pregnant women, combined male to female infection rate ratios from Tebelopele VCT centers and health facilities, and 2001 census population figures, 2003 Sentinel Surveillance, Botswana.

Sentinel Site	15-19 yrs	20-24 yrs	25-29 yrs	30-34 yrs	35-39 yrs	40-49 yrs	Total
Ngami	97	448	925	812	894	1,456	4,632
North East	76	268	415	373	342	745	2,219
Serowe/Palapye	282	847	1,573	1,811	2,252	1,954	8,719
Bobirwa	144	472	823	796	531	878	3,644
Kweneng East	158	1,092	2,144	1,548	1,613	3,695	10,249
Southern	89	433	979	1,369	829	1,725	5,423
Gantsi	21	176	221	353	102	174	1,047
Mahalapye	164	469	1,237	1,173	1,250	1,364	5,658
Kgatleng	69	308	718	766	954	630	3,445
Chobe	16	194	340	584	297	494	1,925
Kgalagadi	27	101	309	317	211	272	1,237
Tutume	176	482	967	923	947	1,738	5,234
Boteti	43	367	795	704	320	992	3,220
Okavango	62	239	488	338	398	397	1,922
Gaborone	138	1,834	4,281	5,060	4,974	5,344	21,630
Francistown	91	821	1,550	1,742	1,579	2,370	8,152
South East	65	206	534	781	694	1,014	3,294
Lobatse	22	168	431	486	456	526	2,088
Selebi Phikwe	77	445	1,247	1,283	781	1,918	5,753
Kweneng West	23	137	435	244	438	529	1,807
Goodhope	78	179	386	319	583	1,188	2,732
Hukuntsi	6	80	196	146	169	265	862
Total of HIV infected men	1,923	9,765	20,993	21,929	20,614	29,668	104,892
% of total N=104892	1.8%	11.6%	27.7%	37.9%	43.9%	43.5%	25.2%
Total men (denominator)	104,850	84,370	75,663	57,894	47,003	68,223	438,003

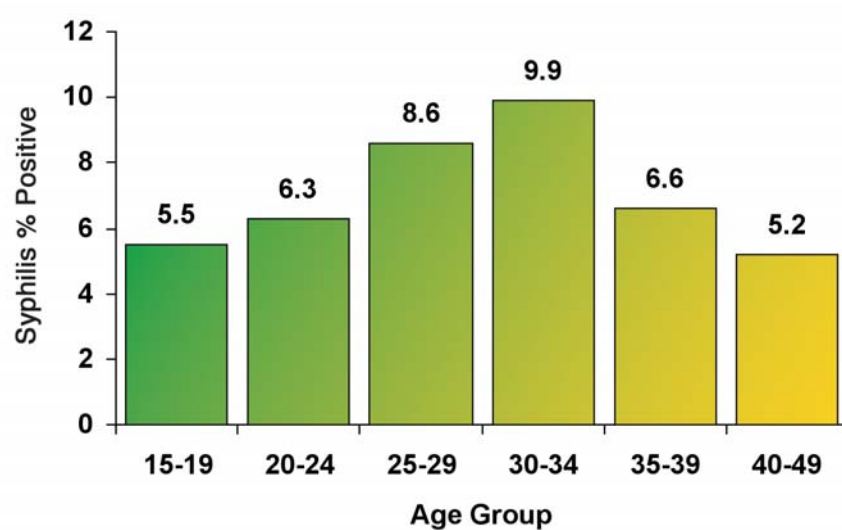
The estimated number of males 15 to 49 years who are HIV positive in Botswana is 105,084. Analyses using different male to female ratios (freestanding Tebelopele centers only and integrated VCT centres in facilities only) yielded estimates ranging from 104,614 to 121,662 infected men. For men, the actual disease morbidity burden is highest in Gaborone, Kweneng East, Serowe/Palapye, and Francistown. Men in age group 15-24 years represent 11.0% of the total of adult men infected with HIV in Botswana; while those aged 25-34 years represent 41.0%.

Table 12: Syphilis test results per district, pregnant women, 2003 Sentinel Surveillance, Botswana.

Sentinel Site	Sentinel Surveillance Participants	Tested for Syphilis No.	Positive Syphilis Results		
			No.	%	95% CI
Ngami	376	*	*		
North East	222	153	4	2.6%	0.1-5.1
Serowe/Palapye	389	424	24	5.7%	3.5-7.9
Bobirwa	255	258	3	1.2%	0.0-2.5
Kweneng East	522	510	8	1.6%	0.5-2.6
Southern	359	366	12	3.3%	1.5-5.1
Gantsi	168	173	3	1.7%	0.0-3.7
Mahalapye	326	306	6	2.0%	0.4-3.5
Kgatleng	353	349	5	1.4%	0.2-2.7
Chobe	115	116	10	8.6%	3.5-13.7
Kgalagadi	161	166	31	18.7%	12.7-24.6
Tutume	429	329	18	5.5%	3.0-7.9
Boteti	260	182	3	1.6%	0.0-3.5
Okavango	328	335	37	11.0%	7.7-14.4
Gaborone	555	*	*	*	*
Francistown	593	628	42	6.7%	4.7-8.6
South East	306	308	7	2.3%	0.6-2.6
Lobatse	246	185	2	1.1%	0.0-2.6
Selebi/Phikwe	302	*	*	*	*
Kweneng West	190	*	*	*	*
Goodhope	137	49	2	4.1%	0.0-9.6
Hukuntsi	100	*	*	*	*
Total	6692	4837	217	4.5%	3.9-5.1

Of the 4,837 women who were tested for syphilis during the survey, 217 (4.5%, 95% CI: 3.9 – 5.1%) were positive. Kgalagadi (18.7%), followed by Okavango (11.0%) and Chobe (8.6%) were the three districts with the highest syphilis rates.

* Data were not available for Ngami, Gaborone, Kweneng West, and Hukuntsi. Valid test results were not available for Selebi Phikwe.

Figure 8: Syphilis test results by age group, pregnant women, 2003 Sentinel Surveillance, Botswana.

Syphilis positivity was highest in the 30-34 year age group at 9.9% followed by the 25-29 year age group with 8.6% positive for syphilis. This contrasts with HIV prevalence, which is highest in the 25-29 year age group.

4.2. DRUG-RESISTANCE AMONG HIV-1C INFECTED, TREATMENT-NAIVE ADULTS IN BOTSWANA

The population-based genotyping data show that, prior to the initiation of its' countrywide public HAART program, HIV-1C infected Botswana did not harbour primary HIV-1B mutations that confer resistance to any of the three major ARV drug classes. A considerable number of secondary protease inhibitor (PI) mutations and polymorphic sites in the RT enzyme predicate the need for continuous population monitoring.

Table 13: Prevalence of genotypic resistance to ARV drugs among HIV-1C infected adult Batswana from the 2001 Sentinel Surveillance survey (n=71).

Type of Mutation	Class of ARV Drug		
	NRTI	NNRTI	NNRTI
Primary	none	none	none
Secondary	G333E/R* (2.8%)	A98S* (1.4%)	L10I (1.4%)
		V179T* (1.4%)	K20R (5.6%)
			M36I (80%)
			L63 P/Q/S/H/T (38%)
			V77I (11.3%)
			I93L (97.2%)

* not known to be associated with drug resistance

25 (35%) samples analysed had 3 or more secondary mutations at PI coding region (pol region codon 1-99)

NOTE: Above genotypic resistance data is evaluated in relation to known HIV-1B resistance data (<http://hivdb.stanford.edu/hiv/>) (Shafer, R. W. (2002). "Genotypic testing for human immunodeficiency virus type 1 drug resistance." Clin Microbiol Rev 15(2): 247-77).

4.3. CD4 CELL COUNTS AMONG HIV-NEGATIVE BATSWANA

A total of 589 sentinel surveillance samples (from the 2001 survey) were collected, and of these 499 were suitable for T-lymphocyte subset enumeration of which 251 (50%) were HIV-negative. Of the 2001 sentinel surveillance participants, 207 were female (median age 23 years) and 44 were male (median age 26 years). Sentinel Survey samples were representative of both urban (61%) and rural (39%) populations from a large catchment area of 11 health districts situated throughout Botswana. Table 14 summarizes the results. The median CD4+ LC values were 599 cells/mm³. The median absolute CD8+ LC was 434 cells/mm³ and the CD4+ to CD8+ ratio was 1.40.

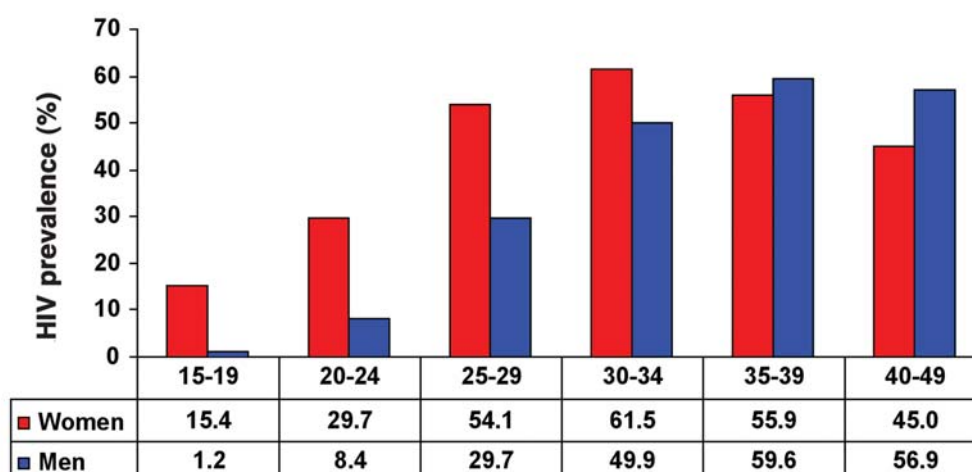
Table 14: CD4+ lymphocyte counts (cells/mm³) of HIV-negative adults in Botswana

Sex	N	Median	Range	2.5th-97.5th percentile	Mean	Standard deviation	95% CI for mean
Female	207	612	152 - 1245	276 - 1062	626	200	(599, 653)
Male	44	591	208 - 1282	233 - 1276	626	246	(551, 701)
Both	251	599	152 - 1282	275 - 1114	626	208	(600, 652)

4.4. TEBELOPELE VTC PROGRAMME DATA

The number of centres have increased over the years. Whereas in 2000 only three centers were opened, it had increased to 16 in 2003. A total of 35,723 persons made one or more visits to these centers between 1 January, 2003 and 30 September, 2003. Of those, 34 439 (96.4%) were tested for HIV. Of those tested 26,741 (77.6%) were first time attendees. The two urban centers Gaborone and Francistown had more than 50% of the clients (Appendix 8.12).

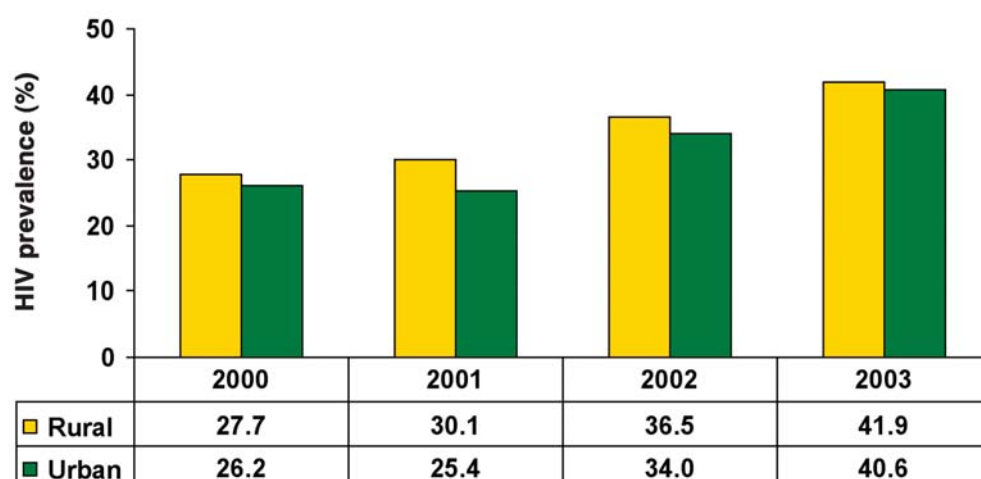
Figure 9: HIV prevalence by age group among men and women aged 15-49. Tebelopele VCT Centres, 2003, Botswana.*



*2003 data through to 30th September only

Among the women tested at Tebelopele sites, prevalence was highest in the 30-34 year age group (61.5%), whereas among men the highest prevalence was in the 35-39 year age group (59.6%). Prevalence among women is strikingly higher than among men in the three youngest age groups, with female prevalence ranging from 13 times higher in 15-19 year olds to twice as high in 25-29 year olds. However, men have higher prevalence than women in the two highest age groups.

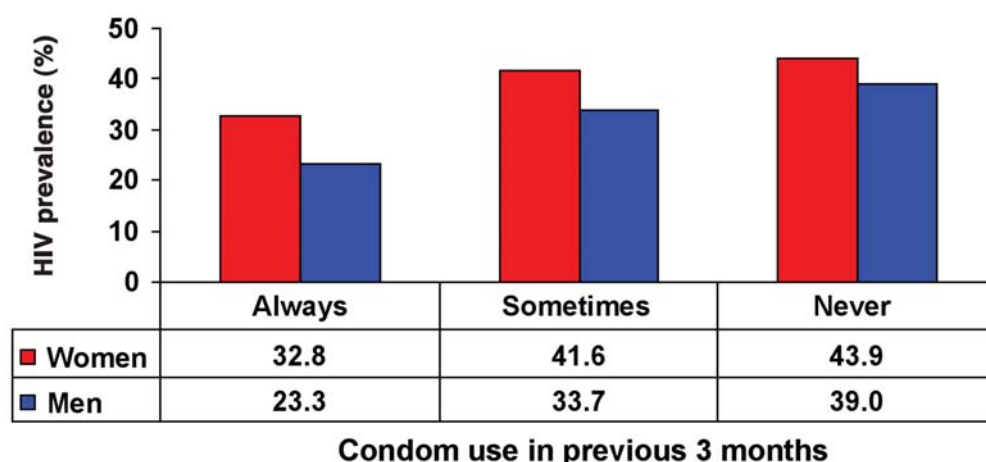
Figure 10: HIV prevalence by residence, Tebelopele VCT centers, 2000-2003*, Botswana.



*2003 data through 30 September only

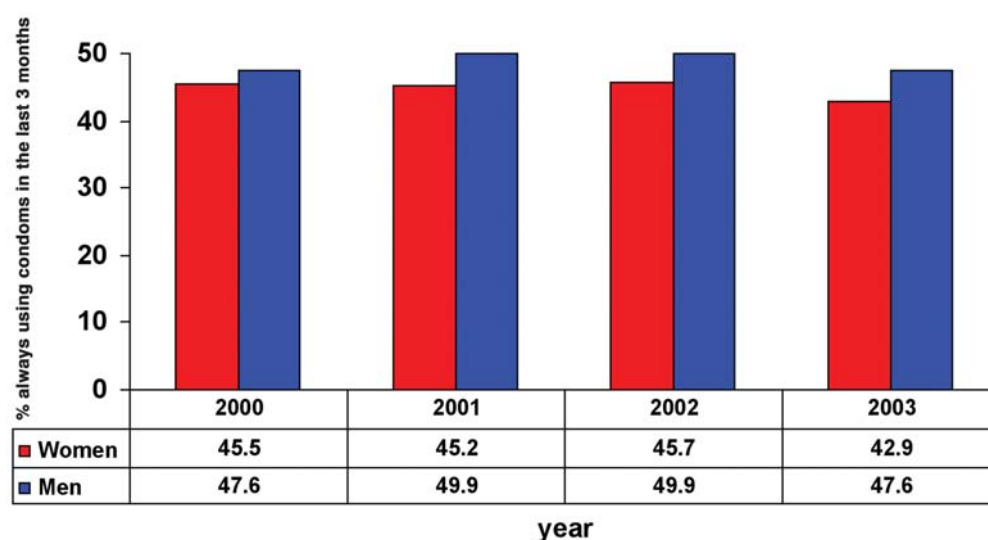
Overall and consistently during the four years, for both women and men, persons with rural residence had slightly higher HIV prevalence than persons with an urban residence. Degree of education is clearly related with the HIV prevalence. Women and men with higher education levels tend to have lower HIV prevalence than persons with lower education. However, HIV prevalence has risen over time within all educational groups for men and women (Appendix 8.13).

Figure 11: HIV prevalence according to reported condom use over the past three months by gender, Tebelopele VCT centers, 2000-2003, Botswana.



HIV prevalence was observed to be lower among persons who reported regular condom use than among those reporting irregular or no use.

Figure 12: Percentage of respondents reporting consistent condom use in the previous 3 months by gender, Tebelopele VCT centers, 2000-2003, Botswana.



The percentage of respondents reporting regular condom use during the past three months has remained relatively stable over the past four years for both men and women. Regular condom use did not vary dramatically by gender.

4.5. HIV/AIDS CASE REPORTING AND MORTALITY

Between 2000 and 2003, a total of 61,350 HIV request forms were sent from the District Health Teams to the Ministry of Health. Of all the records analyzed, 59,127 had results and about half of the subjects (51%) were HIV-positive.

Table 15: Number of HIV Requests and positivity rates by year, 2000-2003

Year	Number of records	Number with test results	Number positive	Percent Positive
2000	10998	10914	6001	55.0
2001	15751	15589	7803	50.1
2002	18931	18139	9081	50.1
2003	15670	14485	7457	51.5
Total	61350	59127	30342	51.3

Positivity rate was highest in the year 2000 but remained relatively stable over the next three years. Among young people (<30 years) positivity rate was consistently higher among women than men while in the older age groups, a reverse pattern was observed. Among males, the highest prevalence was observed in those 30-39 years whereas among females, persons aged 25-34 years had the highest rate.

Figure 13: Age and sex specific prevalence of HIV among those requested to undergo testing, 2000-2003, Botswana

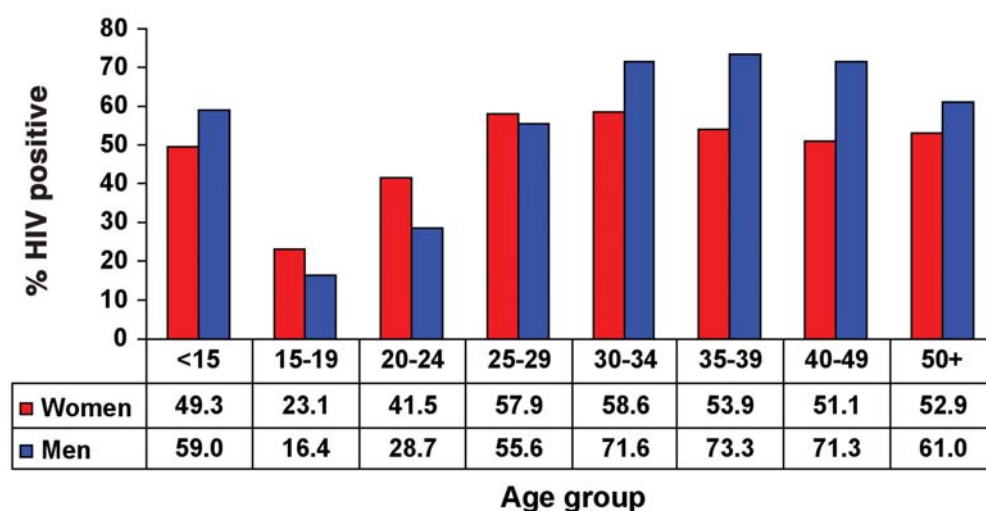
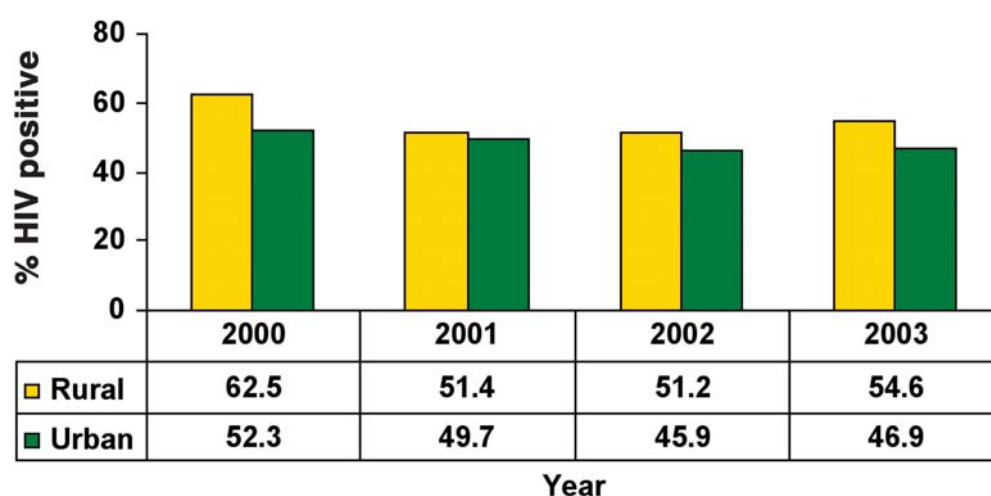
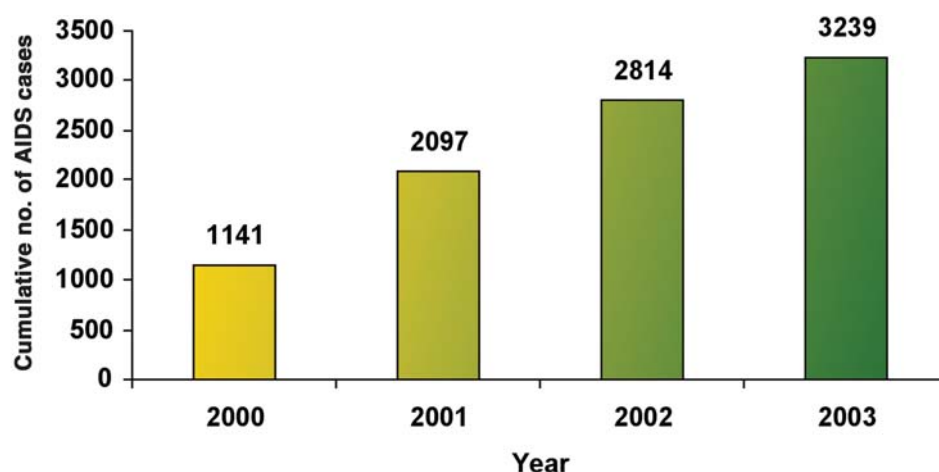


Figure 14: HIV positivity rates by residence, AIDS case reporting 2000-2003, Botswana.

AIDS CASES

Among the 59,127 records with results, 3,239 were classified as AIDS cases. Of the 3,239 cases, gender was indicated for 3,197 of which 1644 (51.4%) were females and 1,553 (48.6%) were males. The number of cases was highest in 2000 and declined over the next three years. It should be noted that the data for 2003 was not complete at the time of this analysis thus the actual number cases for the year will be higher than what is reported here. The cumulative number of cases is shown in Figure 15.

Figure 15: Cumulative AIDS cases in Botswana, 2000-2003.

The proportion of patients who were positive was consistently higher in rural than urban areas. The difference was more pronounced in 2000 and 2003.

Table 16: AIDS cases by age group and year, 2000-2003

Age group	2000	2001	2002	2003	Total
<15	123	126	84	51	384
15-19	26	22	6	9	63
20-24	104	63	45	22	234
25-29	196	172	136	73	577
30-34	217	177	143	76	613
35-39	158	138	105	65	466
40-49	198	168	132	83	582
50+	119	90	65	46	320
Total	1141	956	717	425	3239

In each of the years, the highest number of cases was observed among those aged 30-34 years. In the younger age groups (<35 years) there were more female cases than males whereas in the older, the opposite was the case.

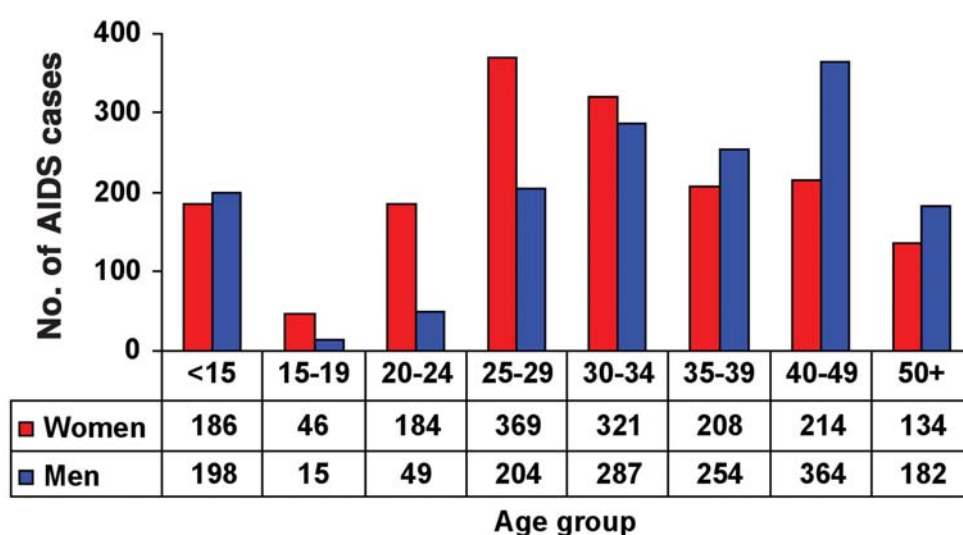
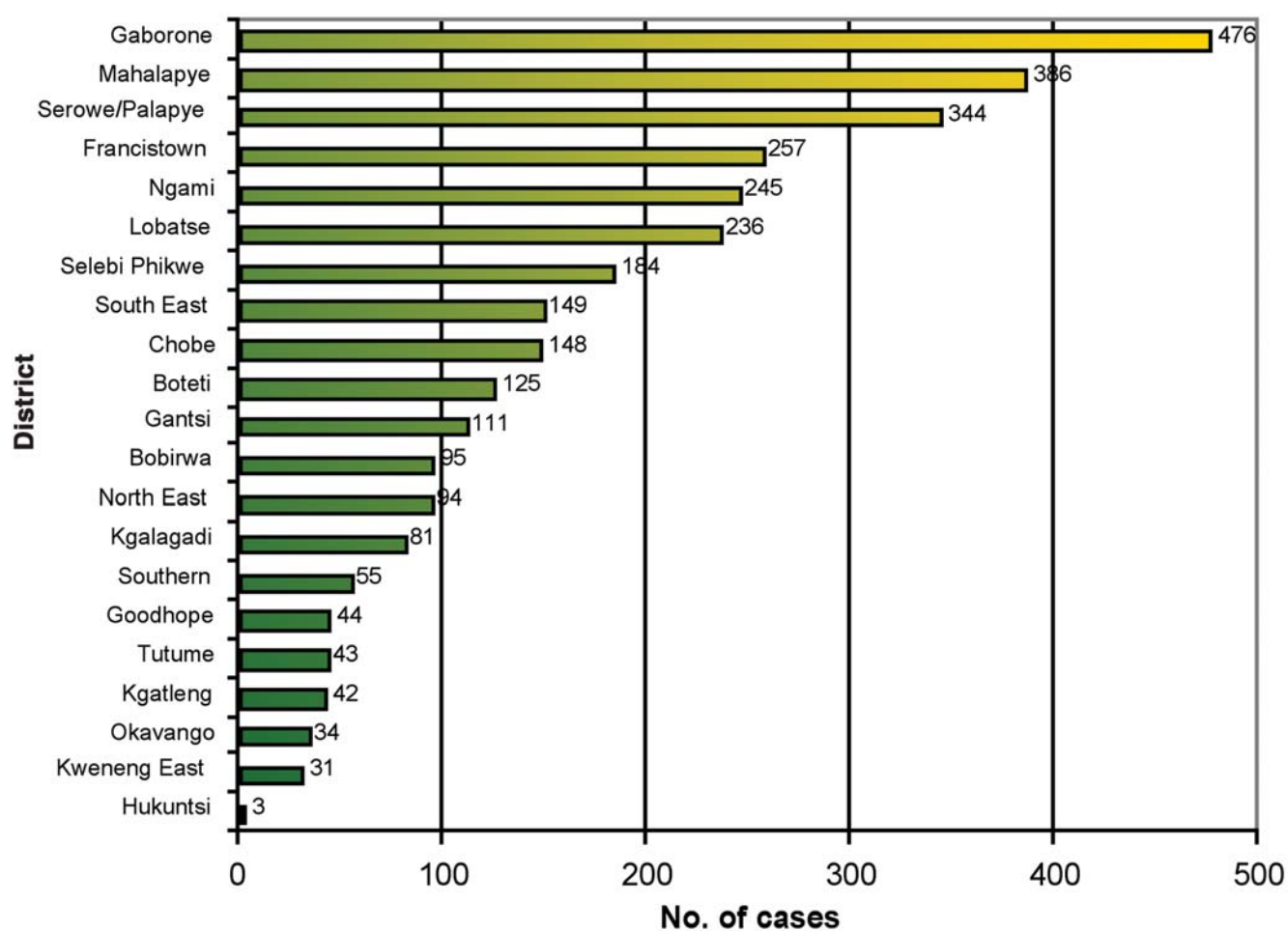
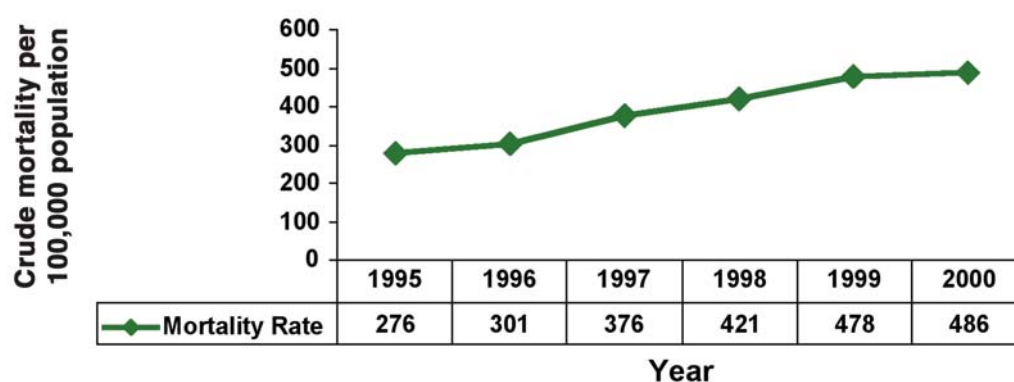
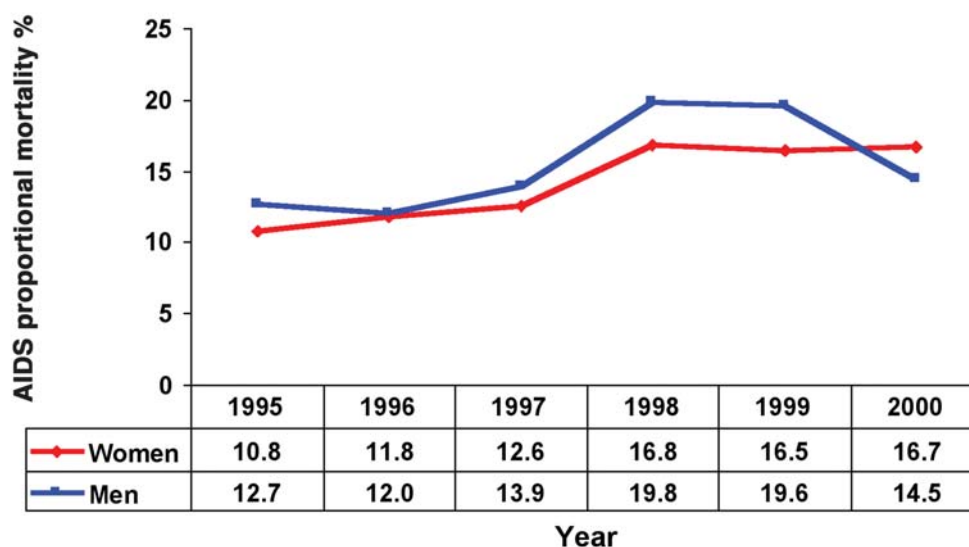
Figure 16: Distribution of reported AIDS cases by age, 2000-2003.

Figure 17: Number of reported AIDS cases in Botswana by district, 2000-2003.

The districts with highest caseloads were Gaborone, Mahalapye, Palapye and Francistown. Those with the lowest were Hukuntsi, Kweneng East, Okavango and Kgatleng.

Figure 18: Crude mortality rate, Botswana, 1995-2000.**Figure 19: AIDS proportional mortality ratio, Botswana, 1995-2000.**

Sources:

- 1) CSO population projections, 1991-2001
- 2) CSO Health Statistics Report, 1995-2000

Since 1995 the crude mortality continues to increase. Between 1995 and 1999, the crude mortality rate has increased by 73.2%, an annual increase of about 15%. In the early stages of the epidemic, the proportional mortality ratio of AIDS was about 10%. Between 1998 and 1999 nearly one in every five deaths in Botswana can be attributed to AIDS. In 2000, the percentage of deaths attributable to AIDS among men declined to 14.5%.

4.6. PMTCT

Table 17: 2002 PMTCT participation, HIV testing, and AZT therapy.

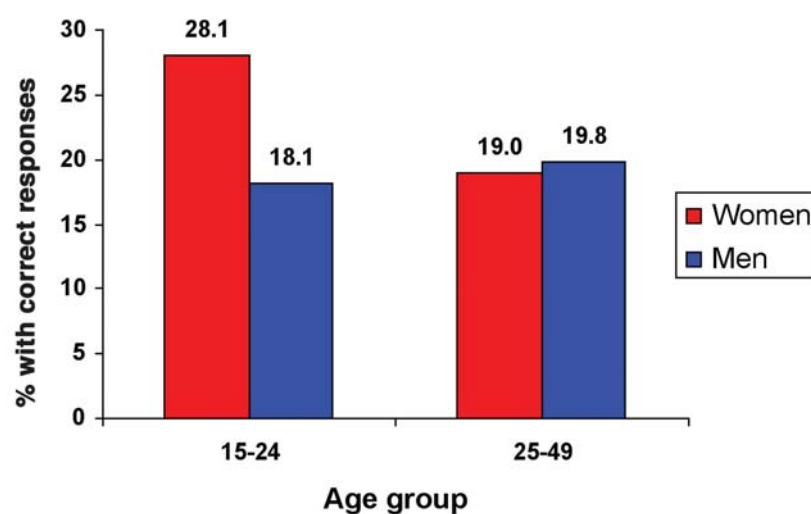
Sentinel Site	New ANC No.	Pre-test		Tested		Positive		Started AZT	
		No.	% Pos	No.	% Pos	No.	% Pos	No.	% Pos
Ngami	1,989	1,356	68	558	41	177	32	104	59
North East	1,152	1,127	98	625	55	242	39	132	55
Serowe/Palapye	3,925	2,356	60	1,372	58	503	37	376	75
Bobirwa	1,894	1,481	78	484	33	298	62	180	60
Kweneng East	2,147	1,763	82	1,183	67	566	48	375	66
Southern	2,990	2,713	91	1,386	51	359	26	230	64
Gantsi	846	808	96	557	69	143	26	30	21
Mahalapye	2,364	1,966	83	963	49	437	45	237	54
Kgatleng	1,724	1,472	85	1,054	72	315	30	142	45
Chobe	572	389	68	259	67	159	61	89	56
Kgalagadi	719	628	87	341	54	78	23	39	50
Tutume	1,940	836	43	393	47	121	31	77	64
Boteti	1,531	1,141	75	329	29	138	42	65	47
Okavango	1,100	660	60	143	22	51	36	40	78
Gaborone	5,873	4,902	83	2,123	43	1,068	50	892	84
Francistown	3,232	3,212	99	1,034	32	566	55	389	69
South East	1,387	1,284	93	582	45	133	23	81	61
Lobatse	1,370	1,250	91	811	65	246	30	161	65
Selebi Phikwe	1,753	1,567	89	473	30	228	48	127	56
Kweneng West	572	389	68	259	67	159	61	89	56
Goodhope	740	740	100	266	36	94	35	39	41
Hukuntsi	428	333	78	181	54	83	46	37	45
Total	40,248	32,373	80	15,376	47	6,164	40	3,931	64

In 2002, the first year of the Prevention of Mother to Child Transmission (PMTCT) program, 80% of new ANC attendees were offered pre-test counseling. Of those counseled, 47% went on to be tested, and of those 40% were positive. Sixty-four percent of the mothers testing positive went on to receive AZT. Across the 22 health districts, this number ranged from a high of 84% in Gaborone to a low of 31% in Gantsi.

As of November 2003, MASA reported that as part of the ARV eligibility 16,400 persons had been tested for CD4 and viral load. Of those, 10,264 patients have started ARVs.

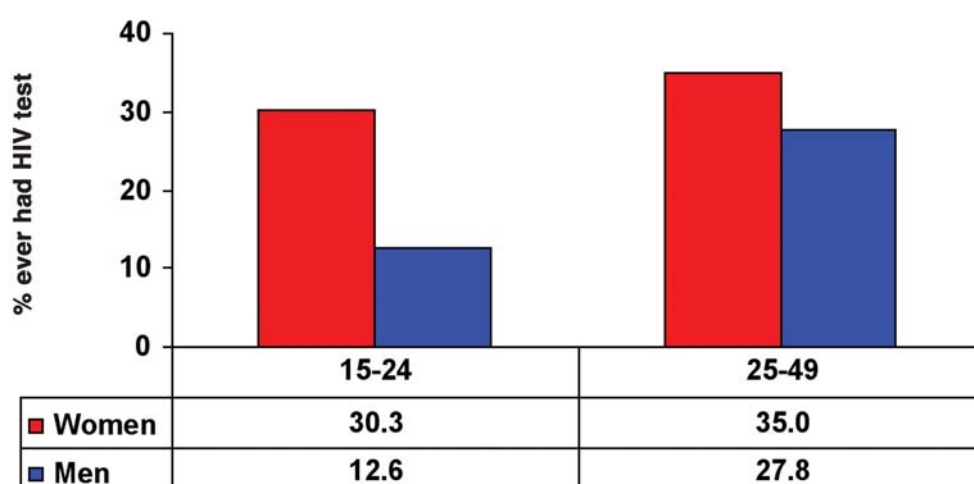
4.7. BEHAVIOURAL SURVEYS

Figure 20: Knowledge of HIV/AIDS among men and women: percent with correct responses to five AIDS knowledge questions, Makgabaneng Radio Listenership Survey, 2003.



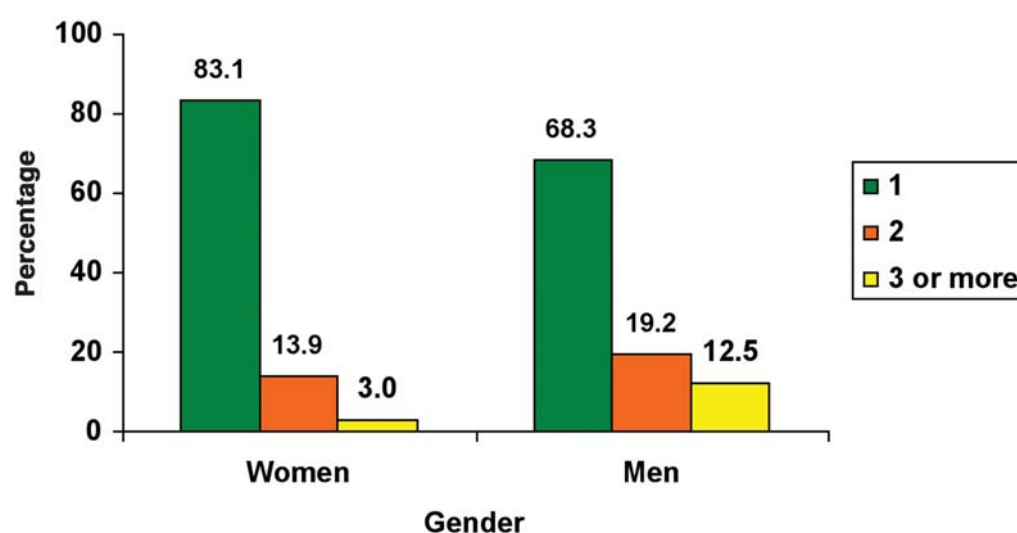
The demographic characteristics of the respondents to the Makgabaneng Radio Listenership survey are shown in Appendix 8.14. Among 15-24 year olds, women (28.1%) were more likely than men (18.1%) to have correct responses on all five AIDS knowledge questions. Substantive knowledge was low for both genders in the 25-49 year old age group. The five HIV knowledge questions included knowing that condom use and having one faithful partner can prevent HIV, that a healthy looking person can transmit HIV, that mosquitoes do not transmit HIV, and that AIDS cannot be cured by sex with virgin.

Figure 21: Percentage who ever had an HIV test by age group and gender, Makgabaneng Radio Listenership Survey, 2003.



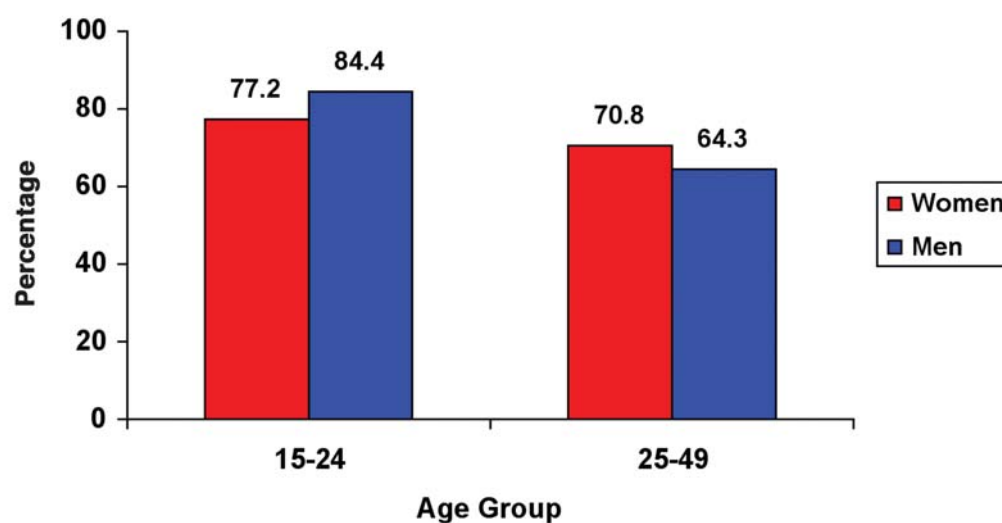
Women in both age groups were more likely to have ever having had an HIV test than men. Among 15-24 year olds, the percentage of women reporting ever having had an HIV test was over twice as great as that of men. Among those ever tested for HIV, men were more likely than women to report having been tested in the past year across both age groups.

Figure 22: Number of sexual partners in the last year among those who had sex (percent distribution), Makgabaneng Radio Listenership Survey, 2003.



Among respondents who were sexually active in the last year, 68.3% of men and 83.1% of females reported having one sexual partner in the past year while 32% of men and 17% of women reported having more than one sexual partner in the last year.

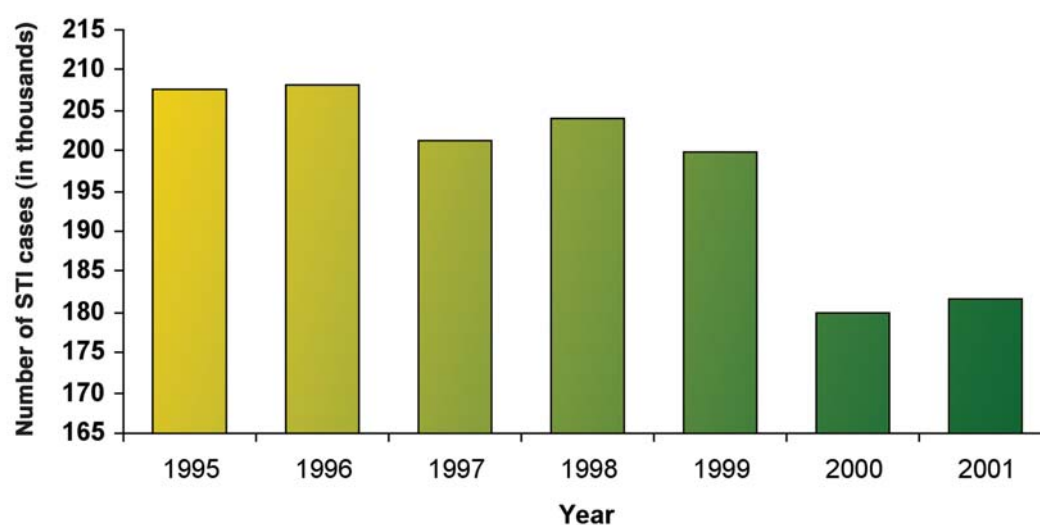
Figure 23: Condom use by gender at last act with a non-marital or non-cohabitating partner by age, Makgabaneng Radio Listenership Survey, 2003



Condom use at the last sex act with a non-marital or non-cohabiting partner was higher among men (84.4%) than women (77.2%) among persons 15-24 but the reverse was true in the older age group. Overall condom use was somewhat higher among young people than among persons aged 25-49.

4.8. SEXUALLY TRANSMITTED INFECTION PROGRAMME DATA

Figure 24: Annual number of STI cases, Botswana, 1995-2001.



Source: CSO Health Statistics Report, 1995-2001

Data on sexually transmitted infections are also routinely collected through the epidemiological reporting system in the country. Reporting covers aetiological and syndromic information on STIs as a determinant of the epidemic. Over the period 1995 to 2001 STIs have declined.

4.9. TUBERCULOSIS PROGRAMME DATA

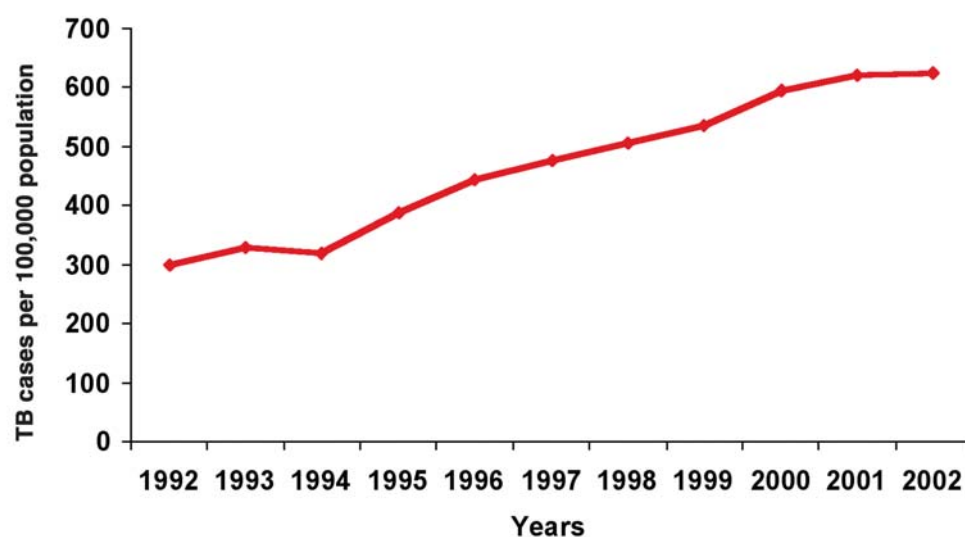
Table 18: 2002 TB Case notification by district, by age group, National TB Programme, Epidemiology and Disease control unit, MoH, Botswana.

Sentinel Site	0-14 No.	15-24 No.	25-34 No.	35-44 No.	45-54 No.	>54 No.	Total No.
Ngami	58	59	134	104	30	37	422
North East	24	37	62	52	19	37	231
Serowe/Palapye	92	80	251	155	80	68	726
Bobirwa	51	48	140	95	48	32	414
Kweneng East	58	140	322	218	122	112	972
Southern	58	91	232	152	99	91	723
Gantsi	48	80	99	120	52	53	452
Mahalapye	83	85	243	177	86	84	758
Kgatleng	34	50	106	86	54	56	386
Chobe	18	14	45	24	13	9	123
Kgalagadi	29	46	85	60	25	29	274
Tutume	72	64	161	134	51	50	532
Boteti	78	67	121	115	56	55	492
Okavango	44	41	70	51	20	31	257
Gaborone	43	213	556	348	135	69	1364
Francistown	86	75	292	216	71	56	796
South East	44	66	116	116	66	41	449
Lobatse	17	42	111	97	43	18	328
Selebi Phikwe	32	69	164	119	54	15	453
Kweneng West	32	41	50	37	24	27	211
Goodhope	23	35	79	41	35	36	249
Hukuntsi	30	47	61	37	17	19	211
Botswana	1,054	1,490	3,500	2,554	1,200	1,025	10,823
total males	545	551	1,779	1,612	812	708	6,007
total females	509	939	1,721	942	388	317	4,816

The total number of TB cases registered during 2002 was 10,823 resulting in a TB notification rate of 623 per 100,000 of population. Of the 10,823 cases, 1,054 were among children aged 0-14.

The two districts with the highest reported TB case load were Gaborone and Kweneng East. Persons aged 25 to 34 years had the greatest number of TB cases reported in 2002 (32% of all cases).

The male/female TB case ratio for 2002 was 1.25. The male to female case ratio varied considerably among the different age groups, ranging from 0.6 for 15-24 year olds to 2.2 for persons greater than 54.

Figure 25: Annual trend of new cases of TB per 100,000, 1991-2002

The rate of reported TB has increased steadily between 1991 and 2002, with an increase of 100% over that time. This corresponds with an annual increase of approximately 10%. In 2002, the BOTUSA project in conjunction with the Ministry of Health conducted a nation-wide multi-drug resistance evaluation. Among the 2425 TB patients, HIV co-infection rate was found to be 60%.

5. DISCUSSION

The World Health Organization and the Joint United Nations Programme on AIDS have advocated for many years, the adoption of second generation HIV surveillance as a strategy for addressing the limitations of the first generation. Second generation HIV/AIDS surveillance is designed to track behaviour, link behaviour to biological surveillance data, and pool data from various sources together in order to increase the explanatory power of sentinel survey data. In Botswana this is the second time that behavioural data, VCT, TB, STI and AIDS case reporting have been linked with HIV sentinel survey data. In addition, we have examined ARV resistance and documented normal CD4 levels among HIV-negative Botswana.

From the available data, it can be observed that HIV/AIDS in Botswana remains a great challenge with a prevalence of 37.4%. The epidemic has affected all districts and localities. Rural areas are affected with equal (and in some cases, greater) intensity as the urban areas. It would be misleading to assume that the epidemic is over. Currently the epidemic affects more than one in every three persons aged 15-49 years. This is a threat to developmental process and to the very existence of the nation of Botswana. Even in districts with lower prevalence, almost one in every four persons aged 15-49 years is affected. Persons aged 25-34 years are those that constitute the most productive age of a nation, but they are now overburdened with HIV/AIDS and are the worst affected. This will likely lead to a depletion of the work force. Indeed, this has already occurred in some sectors such as mining and agriculture and education.

Many factors continue to exacerbate the epidemic in the country. Developmental projects such as mining and road construction has attracted a large number of economically buoyant young men of different nation-

alities to various parts of the country thus bringing them in contact with susceptible and vulnerable young women who are less economically empowered. In major mining districts like Selebi Phikwe the prevalence of HIV is over 50% among young adults aged 15-49 years. Mining towns are endemic foci for the spread of HIV as majority of the miners are usually away from homes for extended period of time and are known to have multiple sex partners. Many cities and towns in Botswana serve as transit and resting points for long distance truckers en-route to neighbouring countries. Francistown in particular, where the prevalence is now 46% is the hub of these major roads.

The increasing trend in prevalence among those over 35 years of age may be a reflection that AIDS-related mortality is slowing down while infected cohorts from younger age groups survive to graduate in to older ages. With the introduction of the ARV programme, there is bound to be a lower AIDS proportionate mortality ratio and the number of people living with HIV/AIDS will increase even if there is a reduction in incidence. This scenario in itself is a challenge because there will to be a large demand for counseling, as well as for therapy.

The significantly higher HIV prevalence among women (than men) in the young age groups supports observation made in many countries that older men prefer and engage in sex with younger women. From the behavioural survey, it was observed that sex with multiple partners was a common practice among young persons (15-24 years). There is need for intense sexuality education and programmes promoting abstinence and safer sex to be designed for young people generally and for young women in particular.

It has been shown that decreasing HIV prevalence reported in some parts of the world are due in part to a decrease in the prevalence of risky sexual behaviour. The behavioural data used in this report were not based on a national sample as only seven districts were purposively selected hence representativeness of the findings is not assured. Moreover, it needs to be pointed out that behavioural information collected from a cross-sectional survey may not be a good measure of the risk of current HIV infection. For example, individuals may use a condom because they are already HIV-positive and therefore relating condom use to HIV prevalence in cross-sectional survey becomes difficult.

Available data indicate a high level of sexual activity among unmarried Batswana. In fact over 80% of the antenatal attendees in the sentinel survey were single mothers. From the behavioural survey, about two thirds of young persons are sexually active. This may explain in part the persistent high prevalence of HIV in the country. The high prevalence among single parents may likely facilitate an epidemic of orphans in the country.

The increasing number of TB cases has been observed in many countries in sub-Saharan Africa. HIV pandemic has worsened the problem of TB during the past two decades. HIV infection renders a person infected with *Mycobacterium tuberculosis* much more likely to develop overt TB and the evolution of the disease is much more accelerated. It has been observed that about 8 – 10% of all TB cases are related to HIV infection and the association is stronger in African countries. There is an urgent need for the provision of not only of anti-retroviral drugs, but also drugs for other opportunistic infections, which will reduce the public health complications of the HIV epidemic and

also reduce the incidence of tuberculosis.

CD4 levels among Batswana were found to be lower than those reported from other countries in the sub-region. It will be important to validate the low CD4+ LC level in Botswana especially as predictors of the extent and rate of HIV disease progression. Furthermore, the increasing reliance on CD4+ LC values for the initiation and monitoring of HAART among HIV-infected individuals in resource-limited settings makes it imperative to adopt and utilize standard methodologies for CD4+ LC counting. The low CD4 levels among Batswana may mean that correspondingly, lower values (than the conventional 200/mm³ used in many countries) may be indicative of the need for therapy. In some countries, deciding on a CD4 cut-off point in determining eligibility for ART has been problematic. While this report has presented normal values for HIV-negative individuals, it is also desirable to compare such values with those of HIV-positive individuals followed over time. Such information would likely form a stronger scientific basis for determining HAART eligibility in Botswana. For many years many have questioned the validity of sentinel survey results. Data from several sources, sentinel survey, VCT, PMTCT, HIV Request from Health facilities, presented in this report, as well as last years report have shown very high degree of agreement in terms of the epidemiological features of HIV infection in the country. In particular prevalence data from PMTCT was quite comparable with the results from sentinel survey data. For this year, from the PMTCT service data, the prevalence was found to be 40% while it was 37.4% from sentinel survey data. Indeed sentinel surveys need not be undertaken as an annual event. Service data from PMTCT could be used to compliment sentinel data.

HIV/AIDS marks a severe development crisis in sub-Saharan Africa, which remains by far the worst affected region in the world. Botswana currently has the highest prevalence of HIV in the sub region. A large proportion of the work force in all sectors of the economy is affected. Children are orphaned and families are affected and many are disillusioned.

Fortunately, as the impact of AIDS continues to threaten the African society, many African leaders are mounting a full-scale response to fight HIV/AIDS, targeting all sectors. There is a high level of political and economic commitment of the part of the government of Botswana. Botswana is among the 19 African nations that have established National AIDS councils or commissions personally chaired by the Head of State to take charge of a multisectoral response to AIDS. The private sector, civil societies including PLWA organizations have risen to the occasion to form a partnership with government in fighting the epidemic. The national response has resulted in setting up prevention programs such as behavior change and communication, Voluntary Counseling and Testing, STI Control and Prevention of mother to child transmission (PMTCT). Care and support programs have been scaled up to include public provision of Highly Active Antiretroviral therapy and Community Home Based Care Programs. Impact mitigation and reduction in stigma have been addressed at all levels by providing funding for income generating activities, support for orphans and vulnerable children, and greater involvement of PLWA. The government of Botswana must stoop to conquer this scourge. It must continue to sustain this momentum so as to bring the epidemic under control.

6. CONCLUSION

HIV/AIDS remains a major public health problem in Botswana affecting all districts and localities.

HIV prevalence in the country ranges from 25% to 52% with a national prevalence of 37.4%. The districts worst affected are Selebi Phikwe, Bobirwa, Chobe and Francistown with prevalence over 45%. Even in districts least affected, the prevalence is over 25%.

The highest age-specific prevalence was observed among those aged 25-29 years. VCT data show significantly higher HIV prevalence among young women than in men of similar ages.

The epidemiological features of HIV infection as observed from various data sources (VCT, PMTCT, HIV Test Requests) in the country are essentially the same.

Mean CD4+ counts among Botswana were lower than values reported in other African countries.

Condom use in the last sex with a non-marital, non-cohabiting risk partner was encouraging as more than two-thirds of sexually active young persons in the behavioural survey responded in the affirmative. There appeared to be no significant behaviour change however (using condom use as an indicator) between the 2001 BAIS survey and the Makgabaneng survey of 2003. Specifically, from the BAIS survey, condom use with a non-marital, non-cohabiting partner was 88% among young men 15-24 years compared to 84% in the Makgabaneng survey. Only about one in five young persons had all correct answers to knowledge questions on HIV/AIDS.

The percentage of sexually young persons who had multiple partners was significantly higher in the latest

survey than in the BAIS of 2001.

There is a growing number of AIDS as well as TB cases while STI cases are decreasing.

A large proportion of mothers attending ANCs were single mothers and the prevalence among this group was higher than those who were married. This is a potential pool for a large number of orphans.

7. RECOMMENDATIONS

1. There is a need to scale up HIV/AIDS intervention programmes especially among the young persons so as to reduce the rate of new infections. Such programmes should include in school as well as out of school youths.
2. In addition to sentinel surveillance, there is a need to closely evaluate the extent of the scourge and the impact of the national response through special population-based surveys.
3. There is a need for extensive community mobilization for increased patronage of voluntary counseling and testing services.
4. Tuberculosis control programme efforts need to be intensified and national treatment algorithms for Tuberculosis as well as for STIs need to be reviewed.
5. There should be a scaling up of anti-retroviral programme to meet the needs of the increasing number of infected persons.
6. In subsequent sentinel surveys, the minimum number of specimens tested during quality assurance per laboratory should be increased. Criteria for acceptance of results and usage in the report should be specified in the survey protocol.
7. The Ministry of Health needs to implement measures that would improve the performance of the laboratories so as to minimize discordant rates in future surveys

8. APPENDICES

8.1. CALCULATED SAMPLE SIZES PER DISTRICT

The targeted sample sizes calculated for the 22 health districts are shown in the Table below. The calculated sample size ranged from 116 to 400. The targeted sample size was achieved in six districts


District	Target Sample Size	Actual Sample Size
Ngami	393	376
North East	391	222
Serowe/Palapye	372	389
Bobirwa	400	255
Kweneng East	355	522
Southern	354	359
Gantsi	187	168
Mahalapye	392	326
Kgatleng	360	353
Chobe	139	115
Kgalagadi	190	161
Tutume	396	429
Boteti	377	260
Okavango	371	328
Gaborone	381	555
Francistown	388	593
South East	337	306
Lobatse	379	246
Selebi/Phikwe	399	302
Kweneng West	238	190
Goodhope	176	137
Hukuntsi	116	100

8.2. SENTINEL SURVEY DATA COLLECTION FORM

Appendix 3: Botswana 2003 sentinel surveillance form

23027

NACA HSS 2003



23027

DEM 01 Date of interview (dd/mm/yy)..... / /

DEM 02 Health District number

Ngami	01	Southern	06	Kgalagadi	11	Francistown	16	Goodhope	23
North East	02	Gantsi	07	Tutume	12	South East	17	Hukuntsi	24
Serowe/Palapye	03	Mahalapye	08	Boteti	13	Lobatse	18		
Bobirwa	04	Kgateleng	09	Okavango	14	Selebi/Phikwe	19		
Kweneng East	05	Chobe	10	Gaborone	15	Kweneng West	20		

DEM 03 Facility's identification number -
See Botswana Health Facility Master List

DEM 04 What is your age (Unknown 88, Refused 99)

DEM 05 Regarding your marital status, are you
Single=1 Living Together=3 Separated=5 Not sure=8
 Married=2 Divorced=4 Widowed=6 Refused=9

DEM 06 Including this pregnancy, how many pregnancies have you had?
The number should be at least 1, and should include miscarriages, abortions. Multiple pregnancies count for one pregnancy

DEM 07 About your employment status now, which is most accurate?
I am unemployed=1 I have a regular job=3 Not sure=8
 I sometimes get temporary jobs=2 Self-employed=4 Refused=9

DEM 08 What is your main occupation?
If currently unemployed, indicate most recent occupation:
 Student =1 Store worker (Retail) =5
 Farmer (animals or plants) =2 Laborer (ie construction, mining, transport) =6
 Domestic help =3 Never employed/Other, =7 please specify
 Office worker/Professional =4 Not sure =8 Refused =9

DEM 09 What is your educational level?
None (has never been in a formal school) =1 University (at least 1 year) =4
 Primary (at least 1 year) =2 Not Sure =8
 Secondary (at least 1 year) =3 Refused = 9

DEM 10 Staff interviewer's surname: _____
 Staff interviewer's given name: _____

Distribution of forms:
 1. Original (top) =for NACA 2. Second copy = for DHT 3. Third copy = stays in booklet at facility

8.3. AGGREGATE SYPHILIS TEST RESULT REPORTING FORM, 2003 HIV SENTINEL SURVEY

Health facility's listing of syphilis test results of pregnant women participating in the sentinel surveillance 2002, to be completed by staff of participating health facilities. This form should be completed at the end of the survey when the exact dates of the surveillance are known and be brought to the consensus meetings in October 2002.

The Record Book of the facility should be consulted retrospectively and the syphilis test results of all pregnant women who came to a specific clinic and who participated in the surveillance should be noted on this form.

Health District number: (Tick correct box:)

North West <input type="checkbox"/>	Southern <input type="checkbox"/>	Kgalagadi <input type="checkbox"/>	Francistown <input type="checkbox"/>	Goodhope <input type="checkbox"/>
North East <input type="checkbox"/>	Gantsi <input type="checkbox"/>	Tutme <input type="checkbox"/>	South East <input type="checkbox"/>	Hukunsi <input type="checkbox"/>
Serowe/Palapye <input type="checkbox"/>	Mahalapye <input type="checkbox"/>	Bobeti <input type="checkbox"/>	Lobatse <input type="checkbox"/>	
Bobirwa <input type="checkbox"/>	Kgatleng <input type="checkbox"/>	Okavango <input type="checkbox"/>	Selibe Phikwe <input type="checkbox"/>	
Kweneng East <input type="checkbox"/>	Chobe <input type="checkbox"/>	Gaborone <input type="checkbox"/>	Kweneng West <input type="checkbox"/>	

Facility's identification number: -
See Botswana Health Facility Master List

Surname of staff person completing this form: _____

Given Name of staff person completing this form: _____

ANC sentinel surveillance

Date sentinel survey began at this facility: //

Date sentinel survey ended at this facility: //

During this **exact, same** period (*consult and tally from facility logbooks*):

Number of first time ANC attendees during this period visit seen at this facility:

Number of first time ANC attendees during this period that have a syphilis test result:

Number of women in 2 above that had a syphilis test result:

Please complete table on next page for all women in 3 above

8.5. LABORATORY RESULTS FORM

Please fax form to NACA, Fax: 570-960 / or 303-273 / or 303-185

Botswana 2002 sentinel surveillance laboratory form

4228

Name of laboratory that did the HIV test (Tick correct box):

Athlone Laboratory <input type="checkbox"/>	Mahalapye Hospital Laboratory <input type="checkbox"/>	Drm Hospital laboratory <input type="checkbox"/>	Selebi/Phikwe Gov Hospital <input type="checkbox"/>
Gantsi Hospital Laboratory <input type="checkbox"/>	Masunga Primary Hospital <input type="checkbox"/>	Palapye Primary Hospital Lab <input type="checkbox"/>	Sekgoma Memorial Hospital <input type="checkbox"/>
Gumare Laboratory <input type="checkbox"/>	Maun General Hospital Lab <input type="checkbox"/>	Rakops Primary Hospital <input type="checkbox"/>	Thamaga/Primary Hospital Lab <input type="checkbox"/>
Gweta Primary Hospital <input type="checkbox"/>	Nyangabwe Hospital Lab <input type="checkbox"/>	Scottish Livingstone Hospital Lab <input type="checkbox"/>	Tsabong Primary Hospital Lab <input type="checkbox"/>
Hukuntsi Primary Hospital Lab <input type="checkbox"/>	Nyangabwe Hospital Lab <input type="checkbox"/>	Sefhare Laboratory <input type="checkbox"/>	Tutume Primary Hospital Lab <input type="checkbox"/>
Other Lab, not on above list <input type="checkbox"/>	Specify _____		

Surname of lab person completing this form: _____

Name of HIV test kit used: Murex Other _____

First name of lab person completing this form: _____

Batch Number of kit: _____

Lab Code	Sentinel Code No.	Date specimen tested	Test result	Comment, if not tested
□□□□	□□□□□		Positive <input type="checkbox"/> Negative <input type="checkbox"/>	Not tested <input type="checkbox"/> Hemolysed <input type="checkbox"/> Other: <input type="checkbox"/> _____
□□□□	□□□□□		Positive <input type="checkbox"/> Negative <input type="checkbox"/>	Not tested <input type="checkbox"/> Hemolysed <input type="checkbox"/> Other: <input type="checkbox"/> _____
□□□□	□□□□□		Positive <input type="checkbox"/> Negative <input type="checkbox"/>	Not tested <input type="checkbox"/> Hemolysed <input type="checkbox"/> Other: <input type="checkbox"/> _____
□□□□	□□□□□		Positive <input type="checkbox"/> Negative <input type="checkbox"/>	Not tested <input type="checkbox"/> Hemolysed <input type="checkbox"/> Other: <input type="checkbox"/> _____
□□□□	□□□□□		Positive <input type="checkbox"/> Negative <input type="checkbox"/>	Not tested <input type="checkbox"/> Hemolysed <input type="checkbox"/> Other: <input type="checkbox"/> _____
□□□□	□□□□□		Positive <input type="checkbox"/> Negative <input type="checkbox"/>	Not tested <input type="checkbox"/> Hemolysed <input type="checkbox"/> Other: <input type="checkbox"/> _____
□□□□	□□□□□		Positive <input type="checkbox"/> Negative <input type="checkbox"/>	Not tested <input type="checkbox"/> Hemolysed <input type="checkbox"/> Other: <input type="checkbox"/> _____
□□□□	□□□□□		Positive <input type="checkbox"/> Negative <input type="checkbox"/>	Not tested <input type="checkbox"/> Hemolysed <input type="checkbox"/> Other: <input type="checkbox"/> _____
□□□□	□□□□□		Positive <input type="checkbox"/> Negative <input type="checkbox"/>	Not tested <input type="checkbox"/> Hemolysed <input type="checkbox"/> Other: <input type="checkbox"/> _____
□□□□	□□□□□		Positive <input type="checkbox"/> Negative <input type="checkbox"/>	Not tested <input type="checkbox"/> Hemolysed <input type="checkbox"/> Other: <input type="checkbox"/> _____

8.6.A WORKSHEET FOR CALCULATING DISTRICT AND NATIONAL ADJUSTED PREVALENCE (FEMALES)

District	2001 FEMALE POPULATION PER DISTRICT AND AGE GROUP BASED ON 2001 NATIONAL CENSUS DATA					Total	2003 DISTRICT AGE SPECIFIC HIV PREVALENCE					NUMBER OF INFECTED WOMEN PER DISTRICT 2003					Total infected women	Age adjusted District HIV prevalence, 2003			
	15-19	20-24	25-29	30-34	35-39		40-49	15-19	20-24	25-29	30-34	35-39	40-49	15-19	20-24	25-29			30-34	35-39	40-49
North West (1)	4770	4109	3217	2464	2142	2611	19313	26.0	37.2	48.7	40.4	41.4	46.2	1,239	1,529	1,566	995	886	1,205	7,421	38.4
North East (2)	3075	1943	1565	1277	1243	2306	11409	27.8	50.8	54.5	42.3	36.0	40.0	854	987	854	540	447	922	4,605	40.4
Serowe/Phalepe (3)	9451	6947	5682	4653	4174	7160	38067	35.2	43.8	52.4	54.2	62.9	28.0	3,328	3,039	2,980	2,520	2,624	2,005	16,496	43.3
Botswana (4)	4080	2815	2413	1838	1705	3049	15900	38.3	61.2	71.7	62.2	39.3	33.3	1,563	1,722	1,731	1,143	670	1,016	7,844	49.3
Kweneng East (5)	12354	10718	8572	6590	5675	8454	52363	16.3	37.1	44.0	29.3	30.8	40.0	2,017	3,976	3,775	1,933	1,746	3,382	16,829	32.1
Southern (6)	8649	6575	5210	4350	3974	6632	35390	11.9	25.2	37.6	41.9	24.2	25.0	1,033	1,558	1,961	1,821	963	1,658	9,094	25.7
Gantsi (7)	1809	1539	1491	1115	1035	1187	8176	14.3	35.7	23.0	31.8	8.0	10.0	258	550	342	355	83	119	1,707	20.9
Maunapye (8)	6556	4632	3653	3216	3053	5054	26164	28.6	34.8	57.4	46.4	45.5	26.3	1,873	1,611	2,095	1,493	1,388	1,330	9,790	37.4
Kgaleng (9)	4334	3590	3076	2398	2014	3412	18824	18.8	29.3	43.2	42.9	48.0	16.7	813	1,051	1,329	1,028	967	569	5,756	30.6
Chobe (10)	1046	1070	1040	728	587	656	5127	20.0	46.7	50.0	81.3	44.4	50.0	209	499	520	592	261	328	2,409	47.0
Kgalagadi (11)	1494	1300	1218	810	744	1079	6645	22.6	25.6	41.2	42.9	25.0	20.0	337	333	502	347	186	216	1,921	28.9
Tlutha (12)	7614	4891	3903	3204	3115	5637	28364	26.1	40.1	52.4	43.1	38.9	37.5	1,990	1,963	2,044	1,381	1,211	2,114	10,704	37.7
Boteti (13)	3656	3126	2506	2078	1773	2462	15601	14.3	40.9	52.1	41.7	16.7	28.6	522	1,277	1,306	866	296	703	4,970	31.9
Okavango (14)	3323	2546	2118	1606	1422	2040	13055	23.7	38.0	49.3	33.3	34.6	21.7	787	969	1,044	535	492	443	4,270	32.7
Gaborone (15)	11322	14944	13206	9814	7246	8704	65236	18.0	41.9	54.2	58.0	58.3	44.4	2,042	6,269	7,153	5,695	4,227	3,868	29,254	44.8
Francistown (16)	5579	5947	5174	3707	2932	3588	28927	25.0	51.7	54.0	51.5	46.5	50.0	1,395	3,075	2,792	1,908	1,364	1,794	12,328	45.8
South East (17)	3706	3919	3308	2478	2116	2838	18365	21.9	19.4	29.3	39.6	34.8	30.8	811	761	968	982	736	873	5,131	27.9
Lobatse (18)	1910	2131	1809	1396	1102	1408	9756	17.1	30.0	42.9	42.4	38.9	28.6	327	639	775	592	429	402	3,165	32.4
Selebi/Phikwe (19)	3414	3658	3243	2222	1708	2280	16525	36.8	49.2	70.8	64.7	40.9	50.0	1,258	1,800	2,297	1,438	699	1,140	8,632	52.2
Kweneng West (20)	2316	1576	1401	1128	1178	1687	9286	10.4	26.4	45.5	23.1	42.1	27.3	241	416	637	260	496	460	2,511	27.0
Goodhope (23)	2718	1733	1417	1184	1266	2203	10521	29.6	34.6	50.0	33.3	54.5	50.0	805	600	709	395	691	1,102	4,300	40.9
Hukuntsi (24)	927	757	667	502	488	597	3938	6.7	30.3	45.8	31.6	33.3	33.3	62	229	306	159	163	199	1,117	28.4
Total	104103	90466	75889	58758	50692	75044	454952							2,3764	34,955	37,686	26,977	21,023	25,849	170,253	37.4
Total pop in age group														104,103	90,466	75,889	58,758	50,692	75,044	454,952	
Overall adjusted age-specific prev (%)														22.8	38.6	49.7	45.9	41.5	34.4	37.4	

Growth adjustment factor of 1.05 not applied to the number infected per site

8.6.B WORKSHEET FOR ADJUSTED HIV PREVALENCE BY DISTRICT (MALES)

District	2001 MALE POPULATION PER DISTRICT AND AGE GROUP BASED ON 2001 NATIONAL CENSUS DATA					Total	2003 DISTRICT AGE-SPECIFIC HIV PREVALENCE RATES AMONG PREGNANT WOMEN					NUMBER OF INFECTED MALES PER DISTRICT USING MALE:FEMALE HIV INFECTION RATIO					Total infected men	2003 Age adjusted District HIV prevalence			
	15-19	20-24	25-29	30-34	35-39		40-49	15-19	20-24	25-29	30-34	35-39	40-49	15-19	20-24	25-29			30-34	35-39	40-49
North West (1)	4,446	3,816	3,222	2,330	1,955	2,416	18,185	26.0	37.2	48.7	40.4	41.4	46.2	97	448	925	812	894	1,456	4,632	25.5%
North East (2)	3,266	1,670	1,291	1,020	860	1,426	9,533	27.8	50.8	54.5	42.3	36.0	40.0	76	268	415	373	342	745	2,219	23.3%
Serowe/Palalpe (3)	9,526	6,129	5,089	3,874	3,241	5,346	33,205	35.2	43.8	52.4	54.2	62.9	28.0	282	847	1,573	1,811	2,252	1,954	8,719	26.3%
Botliva (4)	4,451	2,445	1,945	1,483	1,224	2,019	13,867	38.3	61.2	71.7	62.2	39.3	33.3	144	472	823	796	531	878	3,644	26.9%
Kweneng East (5)	11,518	9,320	8,258	6,113	4,742	7,076	47,027	16.3	37.1	44.0	29.3	30.8	40.0	158	1,092	2,144	1,548	1,613	3,695	10,249	21.8%
Southern (6)	8,827	5,431	4,412	3,790	3,093	5,285	30,838	11.9	25.2	37.6	41.9	24.2	25.0	89	433	979	1,369	829	1,725	5,423	17.6%
Gantsi (7)	1,737	1,559	1,634	1,284	1,157	1,331	8,702	14.3	35.7	23.0	31.8	8.0	10.0	21	176	221	353	102	174	1,047	12.0%
Mahalapye (8)	6,822	4,266	3,660	2,928	2,488	3,972	24,136	28.6	34.8	57.4	46.4	45.5	26.3	164	469	1,237	1,173	1,250	1,364	5,658	23.4%
Kgatleng (9)	4,369	3,328	2,818	2,071	1,799	2,895	17,280	18.8	29.3	43.2	42.9	48.0	16.7	69	308	718	766	954	630	3,445	19.9%
Chobe (10)	942	1,318	1,153	833	605	757	5,608	20.0	46.7	50.0	81.3	44.4	50.0	16	194	340	584	297	494	1,925	34.3%
Kgalagadi (11)	1,404	1,252	1,273	856	763	1,042	6,590	22.6	25.6	41.2	42.9	25.0	20.0	27	101	309	317	211	272	1,237	18.8%
Tludme (12)	8,010	3,804	3,133	2,481	2,202	3,551	23,338	26.1	40.1	52.4	43.1	38.9	37.5	176	482	967	923	947	1,738	5,234	22.6%
Boteti (13)	3,551	2,848	2,587	1,956	1,736	2,660	15,338	14.3	40.9	52.1	41.7	16.7	28.6	43	367	795	704	320	992	3,220	21.0%
Okavango (14)	3,120	1,987	1,680	1,174	1,040	1,400	10,401	23.7	38.0	49.3	33.3	34.6	21.7	62	239	488	338	398	397	1,922	18.5%
Gaborone (15)	9,055	13,843	13,407	10,102	7,714	9,211	63,332	18.0	41.9	54.2	58.0	58.3	44.4	138	1,834	4,281	5,060	4,974	5,344	21,630	34.2%
Francistown (16)	4,300	5,026	4,872	3,921	3,071	3,631	24,821	25.0	51.7	54.0	51.5	46.5	50.0	91	821	1,550	1,742	1,579	2,370	8,152	32.8%
South East (17)	3,507	3,358	3,095	2,284	1,806	2,525	16,575	21.9	19.4	29.3	39.6	34.8	30.8	65	206	534	781	694	1,014	3,294	19.9%
Lobatse (18)	1,506	1,776	1,706	1,327	1,060	1,410	8,785	17.1	30.0	42.9	42.4	38.9	28.6	22	168	431	486	456	526	2,088	23.8%
Selebi/Phikwe (19)	2,493	2,866	2,987	2,297	1,728	2,939	15,310	36.8	49.2	70.8	64.7	40.9	50.0	77	445	1,247	1,283	781	1,918	5,753	37.6%
Kweneng West (20)	2,642	1,637	1,623	1,226	942	1,487	9,557	10.4	26.4	45.5	23.1	42.1	27.3	23	137	435	244	438	529	1,807	18.9%
Goodhope (23)	3,129	1,633	1,308	1,110	967	1,820	9,467	29.6	34.6	50.0	33.3	54.5	50.0	78	179	386	319	583	1,188	2,732	27.4%
Hukuntsi (24)	982	836	724	537	458	610	4,147	6.7	30.3	45.8	31.6	33.3	33.3	6	80	196	146	169	265	862	20.8%
Total	99603	80148	71877	54997	44651	64809	416085							1,923	9,765	20,993	21,929	20,614	29,668	104,892	23.9%
Total pop in age group														104850	84370	75663	57894	47003	68223	438003	
Overall adjusted age-specific prev (%)														1.8%	11.6%	27.7%	37.9%	43.9%	43.5%	25.2%	

8.7. TEBELOPELE VCT FORM (PAGE 1)

**BOTSWANA VOLUNTARY COUNSELING AND TESTING CENTRE
HIV COUNSELLING AND TESTING RECORD (01/01/2003)**

COUNTRY CODE	REGION CODE	DISTRICT CODE (MIS)	SITE CODE	SITE TYPE		CLIENT CODE
BW				1 = Free-standing 2 = Mobile Unit 3 = Primary Health Care 4 = Clinics 5 = Satellite 99 = Other		
RETURN VISIT? 0 = No 1 = Yes	DATE ____/____/____ DD/MM/YYYY	SEX? 1 = Male 2 = Female	AGE? _____	DECISION SESSION TYPE? 1 = Individual 2 = Couple 99 = Other	PARTNER CODE: _____ COUPLE CODE: _____	
NEW CLIENT CODE? 0 = No 1 = Yes	COUNSELLOR CODE: _____		ATTENDED GROUP SESSION? 0 = No 1 = Yes			
COUPLE TYPE? 1 = Married 2 = Premarital 3 = Presexual 4 = Sex partner 98 = N/A 99 = Other	CURRENT RESIDENTIAL CLASSIFICATION 1 = Urban 2 = Rural 99 = Other	CURRENT MARITAL STATUS 1 = Married 2 = Never married 3 = Separated 4 = Divorced 5 = Widowed 99 = Other	EDUCATION 0 = None 1 = Primary 2 = Secondary 3 = Tertiary 99 = Other	EMPLOYMENT STATUS 0 = No 1 = Yes		
OCCUPATION 1 = Unskilled 2 = Skilled 3 = Professional 4 = Business 5 = Disciplined Forces 6 = Student 7 = Farmer/Rancher 8 = Housewife 98 = N/A 99 = Other Employed by Government 0 = No 1 = Yes 98 = N/A	HOW KNEW OUR SERVICES? 1 = Radio 2 = Outreach 3 = Signposts/Posters 4 = Clients 5 = Newsprint 6 = TV 7 = TCM 8 = YOHO 9 = Health facility 10 = Branded VCT vehicle 98 = N/A 99 = Other	MOST IMPORTANT REASON HERE TODAY? (Circle only one) 1 = Client behavior, Risky/Had Risk 2 = Partner behavior, Risky/Had risk 3 = Not trusting partner 4 = Feel ill/Other symptoms 5 = Partner ill/died/with symptoms 6 = Marriage 7 = Family planning 8 = 2 nd Test(Window period) 9 = Get Results Previous Test 10 = Needs counseling 11 = PMTCT, pregnant 12 = Wants TB preventiveTherapy 13 = To Qualify for ARV drugs 99 = Other		CLIENT REFERRED BY: 1 = Self/Not Referred 2 = Public health facility 3 = Private health facility 4 = Relative 5 = Friend 6 = Client 7 = Religious Institution 8 = CBO's/PLWA group 9 = Employer 10 = TCM 98 = N/A 99 = Other		

Risk Reduction Plan:

8.7. TEBELOPELE VCT FORM (PAGE 2)

CLIENT PREVIOUSLY HIV TESTED? 0=No 1=Yes HIV+ 2=Yes HIV- 3=Inconclusive Results 4=Unknown 5=Did Not Take Results 99=Other Date? _____ MM/YYYY	WHERE WAS PREVIOUS TEST TAKEN? 1=This VCT Site 2=Other VCT Site 3=Public health facility 4=Private health facility 5=Red Cross VCT Gaborone 6= Red Cross Blood Donation Service 7=NBTS 98=N/A 99=Others	HAS CLIENT EVER HAD SEX? 0=No 1=Yes WHEN WAS LAST TIME CLIENT HAD SEX? Date: _____ MM/YYYY	NUMBER OF SEX PARTNERS IN LAST 3 MONTHS? Steady: _____ (Number) Non-steady: _____ (Number)	CONDOM USE IN PREVIOUS 3 MONTHS? 0=Never 1=Always 2=Sometimes 98=N/A 99=Other
CLIENT USED CONDOM LAST TIME HAD SEX? 0=No 1=Yes 97=Don't Remember 98=N/A	CLIENT HAS HAD SEX WITH TODAY'S PARTNER? (for couples only) 0=No 1=Yes 98=N/A	IS CLIENT PREGNANT? 0=No 1=Yes 97=Don't Know 98=N/A	WHAT RESULTS DOES CLIENT EXPECT TODAY? 0=Negative 1=Positive 97=Don't Know 98=N/A	DURING LAST SEXUAL ENCOUNTER, CLIENT EXCHANGED SEX FOR MATERIAL ASSISTANCE? 0=No 1=Yes 97=Don't Know 98=N/A
IS CLIENT A COMMERCIAL SEX WORKER? 0=No 1=Yes 97 = Don't Know 98=N/A	TODAYS RESULT(S) FOR: (1)HIV 0=Negative 1=Positive 98=N/A (2)Couple Discordant? 0=No 1=Yes 98=N/A 99=Other Any Symptoms? Cough 0=No 1=Yes 97=DK Fever 0=No 1=Yes 97=DK Weight Loss 0=No 1=Yes 97=DK Skin 0=No 1=Yes 97=DK Hair 0=No 1=Yes 97=DK Other 0=No 1=Yes 97=DK	DID CLIENT REFUSE RESULTS? 0=No 1=Yes 98=N/A DID CLIENT AND COUNSELOR DEVELOP A RISK REDUCTION PLAN TODAY? 0=No 1=Yes	CLIENT WAS REFERRED TO: (multiple responses allowed) (1) IPT 0=No 1=Yes 98=N/A (2) MTCT 0=No 1=Yes 98=N/A (3) For ARV evaluation 0=No 1=Yes 98=N/A (4) Public health facility 0=No 1=Yes (5) Private health facility 0=No 1=Yes	(6) Other PLWA Assoc. 0=No 1=Yes (7) Social Welfare Services 0=No 1=Yes (8) Religious institution 0=No 1=Yes (99) Other
CONDOMS GIVEN TODAY? 0=No 1=Yes <u>If Yes,</u> <u>Number Given</u> _____	SERVICES RENDERED 1=Refused Services? 0=No 1=Yes 2=Counseled? 0=No 1=Yes 3=HIV Testing? 0=No 1=Yes 4=Gave Results? 0=No 1=Yes 5=Referred? 0=No 1=Yes 99=Other	COUNSELOR'S COMMENTS		

8.8. HIV REQUEST FORM

REQUEST FOR HIV TEST

Lab: *Send Pages A & B to the SDMO
Page C to the Clinician*

(1) Date 11/06/02 Age 23 Ys Sex Female

(2) Present Address
Home Address

(3) Indication for Test (Tick one of them)

Symptomatic Other If other, specify PMCT

(4) If "Symptomatic", tick Clinical Features below, if "Other", go to (5)

Weight loss >10% body weight (adults)	<input type="checkbox"/>	Hepatosplenomegaly	<input type="checkbox"/>
Failure to thrive or sudden weight loss in children (>10% in 3 months)	<input type="checkbox"/>	Generalised lymphadenopathy	<input type="checkbox"/>
Chronic or recurrent diarrhoea >1 month	<input type="checkbox"/>	Tuberculosis, specify site:	<input type="checkbox"/>
Prolonged fever >1 month	<input type="checkbox"/>	Dementia	<input type="checkbox"/>
Persistent cough >1 month	<input type="checkbox"/>	Delay or loss of milestones (children)	<input type="checkbox"/>
Severe pneumonia	<input type="checkbox"/>	Other neurological signs, specify:	<input type="checkbox"/>
Severe bacterial infections	<input type="checkbox"/>	Unexplained haematological abnormalities, specify:	<input type="checkbox"/>
Repeated common infections in children (ARI) (More than 2 episodes in 3 months)	<input type="checkbox"/>	Non-healing genital ulcers >1 month	<input type="checkbox"/>
Generalised dermatitis, specify:	<input type="checkbox"/>	Extensive genital warts	<input type="checkbox"/>
Herpes Zoster	<input type="checkbox"/>	Kaposi's sarcoma	<input type="checkbox"/>
Extensive and/or persistent herpes simplex infection	<input type="checkbox"/>	Other symptoms, specify:	<input type="checkbox"/>
Oro-pharyngeal candidiasis	<input type="checkbox"/>		
Confirmed maternal HIV infection (children)	<input type="checkbox"/>		

(5) Has the patient received a blood transfusion? YES / NO

(6) Has the patient been counselled? YES / NO

(7) Name of Clinician:
2002-06-13
NKEYSO MONAMETSI

(8) Name of Health Facility: alwest clinic

(9) Test Result:

(10) Died (Tick if applicable)

HIV REFERENCE LAB
2002-06-13
NKEYSO MONAMETSI

ELISA
HIV ANTIBODY NEGATIVE

SUPPLEMENTARY ELISA
HIV ANTIBODY - NEGATIVE

8.9. BANGUI & ABIDJAN DEFINITIONS OF CLINICAL AIDS (IN ADULTS)

Bangui Definition

In adults, AIDS is defined as the co-existence of at least two major symptoms and at least one minor one, in the absence of any known cause of immunodepression such as malignancy, severe malnutrition or of any other known etiology.

- **Major symptoms:**
 - A - Loss of weight > 10%
 - B - Chronic diarrhea persisting > 1 month
 - C - Fever of over 1 month's duration (intermittent or continuous)

- **Minor symptoms:**
 - A - Cough persisting > 1 month
 - B - Generalized pruritic dermatitis
 - C - Recurrent Herpes Zoster
 - D - Oropharyngeal Candidiasis
 - E - Generalized progressive Herpes Infection
 - F - Generalized lymphadenopathy

The presence of generalized Kaposi's sarcoma or cryptococcal meningitis is sufficient to diagnose AIDS

ABIDJAN DEFINITION = BANGUI definition + HIV positive serology

Revised WHO case definition for AIDS in Africa (Abidjan Conference)

8.11. A/B COMPARISON OF 2002 AND 2003 HIV RESULTS BY INDIVIDUAL AGE GROUPS

District	Age 15 to 19 Years				
	2002		2003		Difference %
	HIV+/N	%	HIV+/N	%	
Ngami (1)	16/61	26.2	20/77	26.0	-0.3
North East (2)	14/43	32.6	15/54	27.8	-4.8
Serowe/Palapye (3)	14/79	17.7	25/71	35.2	17.5
Bobirwa (4)	13/40	32.5	18/47	38.3	5.8
Kweneng East (5)	14/104	13.5	16/98	16.3	2.9
Southern (6)	9/45	20.0	8/67	11.9	-8.1
Gantsi (7)	1/18	5.6	na	na	na
Mahalapye (8)	18/58	31.0	18/63	28.6	-2.5
Kgatlang (9)	4/46	8.7	12/64	18.8	10.1
Chobe (10)	3/16	18.8	3/15	20.0	1.3
Kgalagadi (11)	7/44	15.9	7/31	22.6	6.7
Tutume (12)	22/76	28.9	23/88	26.1	-2.8
Boteti (13)	10/48	20.8	5/35	14.3	-6.5
Okavango (14)	17/65	26.1	18/76	23.7	-2.5
Gaborone (15)	15/72	20.8	11/61	18.0	-2.8
Francistown (16)	11/71	15.5	27/108	25.0	9.5
South East (17)	4/32	12.5	7/32	21.9	9.4
Lobatse (18)	9/34	26.5	6/35	17.1	-9.3
Selebi Phikwe (19)	22/60	36.7	14/38	36.8	0.2
Kweneng West (20)	6/29	20.7	5/48	10.4	-10.3
Goodhope (23)	3/27	11.1	8/27	29.6	18.5
Hukuntsi (24)	5/18	27.8	1/15	6.7	-21.1
Adjusted Prevalence	237/1086	21.0	274/1199	22.8	1.8

District	Age 20 to 24 Years				
	2002		2003		Difference %
	HIV+/N	%	HIV+/N	%	
Ngami (1)	40/84	47.6	48/129	37.2	-10.4
North East (2)	28/62	45.2	32/63	50.8	5.6
Serowe/Palapye (3)	61/168	36.3	56/128	43.8	7.4
Bobirwa (4)	40/101	39.6	52/85	61.2	21.6
Kweneng East (5)	71/203	35.0	69/186	37.1	2.1
Southern (6)	34/120	28.3	29/115	25.2	-3.1
Gantsi (7)	10/35	28.6	na	na	na
Mahalapye (8)	43/108	39.8	40/115	34.8	-5.0
Kgatlang (9)	44/116	37.9	36/123	29.3	-8.7
Chobe (10)	11/33	33.3	21/45	46.7	13.3
Kgalagadi (11)	13/43	30.2	10/39	25.6	-4.6
Tutume (12)	55/117	47.0	59/147	40.1	-6.9
Boteti (13)	36/81	44.4	38/93	40.9	-3.6
Okavango (14)	33/73	45.2	35/92	38.0	-7.2
Gaborone (15)	92/272	33.8	99/236	41.9	8.1
Francistown (16)	66/176	37.5	121/234	51.7	14.2
South East (17)	27/95	28.4	20/103	19.4	-9.0
Lobatse (18)	33/81	40.7	27/90	30.0	-10.7
Selebi Phikwe (19)	60/124	48.4	63/128	49.2	0.8
Kweneng West (20)	18/52	34.6	14/53	26.4	-8.2
Goodhope (23)	17/45	37.8	18/52	34.6	-3.2
Hukuntsi (24)	10/28	35.7	10/33	30.3	-5.4
Adjusted Prevalence	842/2217	37.4	922/2359	38.6	1.2

8.11. C/D COMPARISON OF 2002 AND 2003 HIV RESULTS BY INDIVIDUAL AGE GROUPS AGE GROUPS

District	Age 25 to 29 Years				
	2002		2003		Difference %
	HIV+/N	%	HIV+/N	%	
Ngami (1)	32/57	56.1	37/76	48.7	-7.5
North East (2)	14/32	43.8	24/44	54.5	10.8
Serowe/Palapye (3)	42/84	50.0	43/82	52.4	2.4
Bobirwa (4)	54/72	75.0	33/46	71.7	-3.3
Kweneng East (5)	57/123	46.3	48/109	44.0	-2.3
Southern (6)	39/87	44.8	32/85	37.6	-7.2
Gantsi (7)	7/22	31.8	na	na	na
Mahalapye (8)	30/52	57.7	39/68	57.4	-0.3
Kgatlang (9)	21/62	33.9	35/81	43.2	9.3
Chobe (10)	14/25	56.0	13/26	50.0	-6.0
Kgalagadi (11)	13/43	30.2	14/34	41.2	10.9
Tutume (12)	50/80	62.5	44/84	52.4	-10.1
Boteti (13)	24/45	53.3	37/71	52.1	-1.2
Okavango (14)	29/64	45.3	34/69	49.3	4.0
Gaborone (15)	83/173	48.0	78/144	54.2	6.2
Francistown (16)	58/100	58.0	68/126	54.0	-4.0
South East (17)	32/79	40.5	24/82	29.3	-11.2
Lobatse (18)	29/67	43.2	27/63	42.9	-0.4
Selebi Phikwe (19)	68/100	68.0	51/72	70.8	2.8
Kweneng West (20)	11/25	44.0	15/33	45.5	1.5
Goodhope (23)	12/28	42.9	15/30	50.0	7.1
Hukuntsi (24)	7/16	43.8	11/24	45.8	2.1
Adjusted Prevalence	726/1436	50.0	736/1510	49.7	-0.3

District	Age 30 to 34 Years				
	2002		2003		Difference %
	HIV+/N	%	HIV+/N	%	
Ngami (1)	15/25	60.0	21/52	40.4	-19.6
North East (2)	18/31	58.1	11/26	42.3	-15.8
Serowe/Palapye (3)	22/45	48.9	26/48	54.2	5.3
Bobirwa (4)	18/34	52.9	23/37	62.2	9.2
Kweneng East (5)	33/73	45.2	22/75	29.3	-15.9
Southern (6)	26/56	46.4	18/43	41.9	-4.6
Gantsi (7)	4/18	22.2	na	na	na
Mahalapye (8)	21/38	55.3	13/28	46.4	-8.8
Kgatlang (9)	24/53	45.3	18/42	42.9	-2.4
Chobe (10)	9/18	50.0	13/16	81.3	31.3
Kgalagadi (11)	8/25	32.0	15/35	42.9	10.9
Tutume (12)	18/49	36.7	25/58	43.1	6.4
Boteti (13)	20/48	41.7	15/36	41.7	0.0
Okavango (14)	13/43	30.2	14/42	33.3	3.1
Gaborone (15)	47/92	51.1	47/81	58.0	6.9
Francistown (16)	36/63	57.1	35/68	51.5	-5.7
South East (17)	15/46	32.6	21/53	39.6	7.0
Lobatse (18)	16/40	40.0	14/33	42.4	2.4
Selebi Phikwe (19)	29/55	52.7	22/34	64.7	12.0
Kweneng West (20)	6/19	31.6	6/26	23.1	-8.5
Goodhope (23)	9/21	42.9	5/15	33.3	-9.5
Hukuntsi (24)	5/13	38.5	6/19	31.6	-6.9
Adjusted Prevalence	412/905	46.7	404/911	45.9	-0.8

8.11. E/F COMPARISON OF 2002 AND 2003 HIV RESULTS BY INDIVIDUAL AGE GROUPS AGE GROUPS

District	Age 35 to 39 Years				
	2002		2003		Difference %
	HIV+/N	%	HIV+/N	%	
Ngami (1)	6/18	33.3	12/29	41.4	8.0
North East (2)	5/14	35.7	9/25	36.0	0.3
Serowe/Palapye (3)	14/41	34.1	22/35	62.9	28.7
Bobirwa (4)	10/20	50.0	11/28	39.3	-10.7
Kweneng East (5)	9/35	25.7	12/39	30.8	5.1
Southern (6)	6/37	16.2	8/33	24.2	8.0
Gantsi (7)	1/13	7.7	na	na	na
Mahalapye (8)	14/24	58.3	15/33	45.5	-12.9
Kgatlang (9)	11/27	40.7	12/25	48.0	7.3
Chobe (10)	8/10	80.0	4/9	44.4	-35.6
Kgalagadi (11)	5/14	35.7	3/12	25.0	-10.7
Tutume (12)	15/30	50.0	14/36	38.9	-11.1
Boteti (13)	3/23	13.0	3/18	16.7	3.6
Okavango (14)	8/20	40.0	9/26	34.6	-5.4
Gaborone (15)	18/43	41.9	14/24	58.3	16.5
Francistown (16)	13/33	39.4	20/43	46.5	7.1
South East (17)	7/26	26.9	8/23	34.8	7.9
Lobatse (18)	5/12	41.7	7/18	38.9	-2.8
Selebi Phikwe (19)	10/19	52.6	9/22	40.9	-11.7
Kweneng West (20)	5/18	27.8	8/19	42.1	14.3
Goodhope (23)	2/10	20.0	6/11	54.5	34.5
Hukuntsi (24)	3/4	75.0	2/6	33.3	-41.7
Adjusted Prevalence	178/491	36.2	210/539	41.5	5.2*

District	Age 40 to 49 Years				
	2002		2003		Difference %
	HIV+/N	%	HIV+/N	%	
Ngami (1)	2/8	25.0	6/13	46.2	21.2
North East (2)	4/14	28.6	4/10	40.0	11.4
Serowe/Palapye (3)	3/8	37.5	7/25	28.0	-9.5
Bobirwa (4)	7/19	36.8	4/12	23.3	-3.5
Kweneng East (5)	5/29	17.2	6/15	40.0	22.8
Southern (6)	6/18	33.3	4/16	25.0	-8.3
Gantsi (7)	1/6	16.7	na	na	na
Mahalapye (8)	4/23	17.4	5/19	26.3	8.9
Kgatlang (9)	2/6	33.3	3/18	16.7	-16.7
Chobe (10)	0/3	0.0	2/4	50.0	50.0
Kgalagadi (11)	1/3	33.3	2/10	20.0	-13.3
Tutume (12)	6/18	33.3	6/16	37.5	4.2
Boteti (13)	2/5	40.0	2/7	28.6	-11.4
Okavango (14)	4/19	21.1	5/23	21.7	0.7
Gaborone (15)	5/14	35.7	4/9	44.4	8.7
Francistown (16)	6/15	40.0	7/14	50.0	10.0
South East (17)	2/10	20.0	4/13	30.8	10.8
Lobatse (18)	1/7	14.3	2/7	28.6	14.3
Selebi Phikwe (19)	4/14	28.6	4/8	50.0	21.4
Kweneng West (20)	3/15	20.0	3/11	27.3	7.3
Goodhope (23)	3/15	20.0	1/2	50.0	30.0
Hukuntsi (24)	1/3	33.3	1/3	33.3	0.0
Adjusted Prevalence	72/272	28.8	83/265	34.4	5.7*

8.12. ENROLLMENT OF FIRST TIME VCT ATTENDEES BY SEX AND AGE GROUP,

TEBELOPELE VCT PROGRAM, 2000-2003*, BOTSWANA
(*INCOMPLETE YEAR, AS OF 30 SEPTEMBER 2003)

Women

Tebelopele Centre	2000	2001	2002	2003*	Total
	No	No	No	No	No
Gaborone	326	3631	4777	4130	12864
Francistown	629	1276	1826	2065	5796
Selebi Phikwe	0	663	867	1031	2561
Maun	18	354	471	891	1734
Jwaneng	0	214	393	404	1011
Kasane	0	180	313	239	732
Serowe	0	312	807	878	1997
Lobatse	1	59	687	533	1280
Letlhakane	0	6	510	591	1107
Palapye	0	0	758	719	1477
Gantsi	0	0	240	347	587
Mochudi	0	0	555	654	1209
Kanye	0	0	238	586	824
Molepolole	0	0	28	906	934
Tsabong	0	0	94	267	361
Mahalapye	0	0	0	772	772
Total	974	6695	12564	15013	35246

Men

Tebelopele Centre	2000	2001	2002	2003*	Total
	No	No	No	No	No
Gaborone	304	3098	3356	2958	9716
Francistown	609	1108	1592	1612	4921
Selebi Phikwe	0	548	737	710	1995
Maun	16	390	463	671	1540
Jwaneng	0	208	345	384	937
Kasane	0	291	413	297	1001
Serowe	0	228	564	520	1312
Lobatse	0	42	611	467	1120
Letlhakane	0	7	560	590	1157
Palapye	0	0	526	507	1033
Gantsi	0	0	250	385	635
Mochudi	0	0	441	473	914
Kanye	0	0	160	445	605
Molepolole	0	0	22	521	543
Tsabong	0	0	99	271	370
Mahalapye	0	0	0	499	499
Total	929	5920	10139	11310	28298

8.13. HIV PREVALENCE BY EDUCATION AMONG FIRST TIME VCT ATTENDEES, TEBELOPELE VCT PROGRAM, 2000-2003*, BOTSWANA (*INCOMPLETE YEAR, AS OF 30 SEPTEMBER 2003)

Women

Education	2000		2001		2002		2003*		Total	
	No.	% Pos	No.	% Pos	No.	% Pos	No.	% Pos	No.	% Pos
None	9	66.7	58	53.4	234	57.7	792	52.9	1,228	53.6
Primary	115	53.0	613	55.0	1598	61.2	3,563	58.2	6,502	58.7
Secondary	560	35.7	3188	33.6	5470	39.4	8,080	45.9	19,265	41.3
Tertiary	284	16.2	2155	17.1	2445	22.1	2,771	24.4	8,377	21.3

Men

Education	2000		2001		2002		2003*		Total	
	No.	% Pos	No.	% Pos	No.	% Pos	No.	% Pos	No.	% Pos
None	21	47.6	151	45.0	499	56.9	963	57.9	1,634	56.3
Primary	121	40.5	613	50.6	1,683	58.8	2,557	59.5	4,974	57.7
Secondary	482	19.1	2,835	21.0	4,954	23.6	5,207	29.0	13,478	25.0
Tertiary	300	12.3	2,289	14.5	2,963	17.5	2,695	19.4	8,247	17.1

8.14. DEMOGRAPHIC CHARACTERISTICS OF MAKGABANENG RADIO LISTENERSHIP RESPONDENTS

Characteristic	Male	25-29 yrs	35-39 yrs
Age Group			
15-19	158	163	321
20-24	247	238	485
missing	0	1	1
Total	405	402	807
Marital Status			
single	276	249	525
cohabiting	66	83	149
married	51	56	107
divorced	7	1	8
widowed	5	11	16
missing	0	2	2
Total	405	402	807
Education			
none	54	29	83
primary	99	103	202
secondary	200	230	430
post-secondary	52	39	91
missing	0	1	1
Total	405	402	807
Occupation			
formal employment	162	131	293
informal/casual employment	61	29	90
subsistence/housewife/unemployed	113	174	287
student	67	68	135
other	0	0	0
missing	2	0	2
Total	405	402	807
# Births			
none	208	133	341
one	72	90	162
more than one	121	175	296
missing	4	4	8
Total	405	402	807

*all values are not weighted

8.15. NAMES OF PARTICIPATING STAFF AND HEALTH FACILITIES

District	SDMO/DMO	Matron	CHN
1. Ngami	Dr J.E.O Aruwa	B.F. Nfila	B.B Mbwe
2. North East	Dr. D.S. Phiri	K. Mabula	M. Dintweng
3. Serowe/Palapye	D. Kabamba	S. Chikunyana	M.K. Lobelo
4. Bobirwa	Dr. B.M Wafuwana	K.K. Sekga	K. Malesela W. Setlhogile
5. Kweneng East			N. Mogwera
6. Southern Jwaneng	Dr. Elyetu Dr. K. Kazadi	B. Ali	L. Kgwetane B. Opelo
7. Gantsi	K. J. Kashaia	S. Ngwako	M. Kgosimolao
8. Mahalapye		E. Rannoba	A.M. Mabreden
9. Kgatleng	Dr. G.G. Mbugua	S. Paulus, V. Morebodi	G. Kedikilwe
10. Chobe	Dr. J. Chambo	D. Otswakae	U. Letsholathebe
11. Kgalagadi	Dr. Baraza	E.B. Dube	B. Lekaukau
12. Tutume	Dr I.M. Kempanju	M. Pone	G.G. Dubani
13. Boteti	Dr. G. Oriokot		A. Ramhitshana
14. Okavango	Dr. Nsiala, Dr Chinkoyo		Maruapula
15. Gaborone	Dr Malanguka		T.S Mautenyane
16. Francistown	Dr Thuku	P. Maphanyane	M. Nyathi
17. South East	Dr. Medhin		M. Tapela
18. Lobatse	Dr Tsadik	M. Mopedi	C.K Baakile
19. Selebi Phikwe	Dr Hlangabeza	K. Mabechu S. Chite	E. Dintwe
20. Kweneng West	Dr Mpoyo		V. Ntapu
23. Goodhope	Dr. Malaba	Mrs Kebalefetse	D. Nkgageng, G Rabasiako
24. Hukuntsi		M. Mabebe	T. Leipego

Name	Hospital	Designation
Maun General Hospital	C.N. Mokopane J. Obatre	MLT CMLT
Gumare Primary Hospital	F. Samuel J. Ditshenyegelo	SMLT MLT
Rakops Primary Hospital	Felix Mulenga	SMLT
Lethakane Primary Hospital	L. Keikotlhae E. Mabona	MLT MLT
Orapa Mine Hospital	J. Kerebotswe	
Ditsweletse Clinic	D. Montshiwa	MLT
Kasane Primary Hospital	M. Sekgoa	SLT
Selebi Phikwe Government Hospital	C. Ramatapana	CMLT
Mmadinare Primary Hospital	G. Mabusa J. Mooki	SMLT MLT
Bobonong Primary Hospital	G. Letsibogo S. Kaartze	SMLT MLT
Masunga Primary Hospital	B. Basaakane	SMLT
Tutume Primary Hospital	G. Malomo	SLT
Gweta Primary Hospital	M. Majoo	SLT
Sekgoma Memorial Hospital	L. Molomo	SMLT
Palapye Primary Hospital	M. Sekepe	MLT
Thamaga Primary Hospital	Mr. Maruping	
Scottish Livingstone	B. Lenkopane	SMLT
Kanye SDA Hospital	Ramaja	MLT
Gantsi Primary Hospital	I. Olebile T. Boikanyo	MLT MLT
Mahalapye Primary Hospital	S.Ranku	PRN
Sefhare Primary Hospital	B. Gumbalume	SLT
Deborah Retief Memorial	G.J Mpoko G. Motlhabane	SMLT MLT
Tsabong Primary Hospital	K.E. Podi S. Batlang	SMLT SMLS
Jubilee Clinic	M. Mogotlhwane	MLT
Bamalete Lutheran Hospital	B. Fundisi	MLT
Athlone Hospital	T. Matsuokwane	
Goodhope Primary Hospital	V. Thadi S. Moreetsi	MLT MLT
Hukuntsi Primary Hospital	C. Syabula K. Gofamodimo	MLT MLT
NBTC	W. Kalake	Chief MLT

DISTRICT	FACILITY	PARTICIPATING OFFICIALS
1. Ngami	Maun Gen Hospital Maun Clinic Sehitwa Clinic Boyei Clinic Tsau Clinic Sedie Clinic Makalamabedi Clinic Boseja Clinic Shorobe Clinic Thitoyamokolo Health Post	S. Mohube, G Obatre, G. Mokubung D. Oitsile, G. Mwale R. Kusane, K. Kgoboge T.K. Sehuba, P. Mokwena, T. Manyepedza, G. Segosele L. Phiri, C. Boikanyo, O. Waloka V. Letshola, N. Kibakaya K. Ditshotlo, C Katebe R.P. Mongale, M. Mogende P. Handukani, P. Tholo S. Leshaga, O. Gubago
2. North East	Masunga Clinic Makaleng Clinic	B. Radikgomo G. Ranku K. Buku B. Monyika
3. Serowe/Palapye	Sekgoma Memorial Hosp. Palapye P. Hospital Newtown Clinic Serowe Clinic Moiyabana Clinic Mmashoro Clinic Lotsane Clinic Kediretswa Clinic Lerala Clinic	E. Malamu N. Chimidza, J. Bolebantswe K. Kgomotsego N. Motheo M. Chamme Balopi O. Khao D. Badisang D. Malawana
4. Bobirwa	Bobonong P. Hospital Mmadinare P. Hospital Sefophe Clinic Manga Clinic Tsetsebjwe Clinic Semolale Clinic Mathathane Clinic Borotsi Clinic Moletemane H. Post	J. Malema N. Moitoi G. Mwando T. Nsakwa R. Botshabelo M. Ramolathla G. Tsholo A. Sankoloba O. Phuthego
5. Kweneng East	Scottish Livingstone Kgosing Clinic	N. Mwanza B. Gabobegwe

Botswana 2003 Second Generation HIV Surveillance Report

DISTRICT	FACILITY	PARTICIPATING OFFICIALS
6. Southern Jwaneng	Kanye Clinic Mahikana Clinic Kgwatlheng Clinic Sebego Clinic Mmamokhasi Clinic Molapowabojang Clinic Moshopa Council Clinic Moshupa H. Post Dada Clinic Sese H. Post Letlhakane East Clinic Ntlhantlhe Clinic Ditsweletse Clinic	D. Mokobane, G. Mudongo S. Shadikong Mrs. Moshimba M. Dibeela D. Sekgwa E. Hlomani C. Maswabi Mrs. Leshope S. Methikge D. Ntsimako Mrs. Nchoko D. Searobi M. Paulus, O. Montsho, V. Mogonono
7. Gantsi	Shha H. Post Gantsi Clinic D'Kar H. Post	C. Viruwa T. Mabaiwa T. Taruvinga
8. Mahalapye	Mahalapye P. Hospital Sefhare P. Hospital Leetile H. Post Baitiredi Clinic Madiba H. Post Airstrip Clinic Ramokgonami Clinic Pilikwe Clinic Macheng Clinic Chadibe Clinic Kalamare Clinic Shoshong Clinic Seleka Clinic Mookane Clinic	M. Mabusa S. Ntau B. Nkane G.M. Mooketsi M. Kgosietsile L. Sebego K. Mophane J. Mmerekhi C. Tibone M. Monageng A. Gaetote S. Siso C. Molale
9. Kgatleng	DRM Mochudi Clinic 1 Artesia Clinic Bokaa Clinic Mathubudukwane Clinic Mochudi Clinic 2 Oodi Clinic Boseja Clinic	B. Nuku, P. Sejamitwa K. Badumetse, O. Magashula T. Mosugelo, T. Musonda J. Soko, S. Monosi M. Poonyane, F. Moyo P. Setswamokwena, M. Meleki L.S. Moyo, B. Bashanako B. Phutego, S. Makhwaje

DISTRICT	FACILITY	PARTICIPATING OFFICIALS
	Makakatlela Rasesa Clinic	L. Segare, L. Mbulawa K. Kgosidialwa, C. Moremi
10. Chobe	Kasane P. Hospital Kasane Health Post Plateau Health Post Mabele Health Post Kachikau Clinic Pandamatenga Clinic	B. Maphanyane S. Nginya O. Phalayagae N. Beunyengua M. Mukono D. Kebalepile
11. Kgalagadi	Tsabong P. Hospital Verda Clinic Hereford Clinic Middlepitts Clinic Tsabong Catchment Area Makopong Catchment Area	M. Matheatau, A. Samson G.M. Bwalya A. Morwamang B. Chiroze J. Mothupe S. Lesole
12. Tutume	Tutume P. Hospital Magapatona Health Post Nkange Clinic Maitengwe Clinic Sebina Clinic Mathangwane Clinic Tonota Clinic Mosetse Health Post Dukwi Clinic Sowa Clinic Nata Clinic Gweta P. Hospital	P. Gothamodimo M. Mokgetse O. Rabasoma T. Mabophiwa P. Fanikiso K. Motlamme V. Montsho, L.K. Nthutang, T. Negasa P. Rapotsanyane J. Kgosinkwe Dr Mihigo N. Otukile N. Baliki
13. Boteti	Letlhakane P. Hospital Letlhakane Clinic	J. Molokwane Mrs. Mapogo
14. Okavango	Gumare P. Hospital Etsha 6 Clinic Seronga Clinic Shakawe Clinic Nokaneng Clinic Xakao Clinic Sepopa Clinic	B. Bolele P. Silwamba Ditsela O. Tshipayagae Q. Thusang B. Mokhawe E. Sigweni
15. Gaborone	BTA Old Naledi Clinic Block 9 Clinic	J. Dintwe R. Phindela B. Moalosi

DISTRICT	FACILITY	PARTICIPATING OFFICIALS
	Broadhurst 2 Clinic Extension 2 Clinic	P. Zibochwa M. Mmolawa, Mosomodi
16. Francistown	Area W Clinic Tswaragano Clinic	C. Monyatsiwa M. Mokgatlaotsile
17. South East	Bamalete Lutheran Hospital Lesethana Clinic Siga Clinic Nkaikela H. Post Khayakholo H. Post Taung Clinic Otse Clinic	D. Kitsiso, D. Moagi J. Butale, E. Ntlhale J. Mothupi, S. Montsho R. Kowa, M. Majeka D. Kazunguza, L. Bolatlhilwe M. Hisayi, G. Dipholo R. Mukwevho, S. Tutwane
18. Lobatse	Tsopeng Clinic Peleng East Clinic Woodhall Clinic Peleng Central Clinic Athlone P. Hospital	B. Tshenyego, L. Segokgo A. Segapo, M. Ramopedi, Boemo M. Molefhi, L. Kelebogile M. Pheto, D. Humbu S. Leposo, O. Kowa, M. Motsamai, Dr Kambinda, K. Motsuokwane
19. Selebi Phikwe	Tapologong Clinic Botshabelo Clinic	M. Modumedi Ramosukwane T. Smith
20. Kweneng West	Letlhakeng Clinic Botlhapatlou H. Post Ngware Clinic Khudumelapye Clinic Salajwe Clinic Motokwe Clinic Takatokwane Clinic Ditshegwane Clinic Sesung H. Post Moshaneng Clinic Kotolaname Clinic	V. Mokone, G. Ramosenane, C. Kgotlaname, C. Kwakwadi G. Magapu, P.S. Otsheleng L. Matjologwe K. Radipati, T. Busang K. Thebenyana, M. Phiri T. Mafika, O. Hanqiwe I. Ramotswetla, O. Muzvidziwa C. Moleele-Segole L. Moeti, I. Phathswane C. Kasheeka, F. Bhumane M. Pilane
23. Goodhope	Goodhope P. Hospital Pitsane Clinic Rakhuna Clinic Ramatlabama Clinic	K. Mokonyane G. Pheto Mrs Ranthadi, Ms Masepela Mr Khumalo, Ms Seabo Ms Mohutsiwa,

DISTRICT	FACILITY	PARTICIPATING OFFICIALS
	Hebron Clinic Pitshane Molopo Clinic Mabule Clinic Tshidilamolomo Clinic Mmathete Clinic Digawana Clinic	K. Mantswenabe Ms Bareki, Mrs Thakanelo Mrs Phale, Mrs Chavula Ms Keraanang, Mrs Rasetshwane Ms Tautona M. Seretse, M. Matoko, Ms Setiko S. Makhulumo, Mrs Chipausha
24. Hukuntsi	Kang Clinic Hukuntsi Clinic Hukuntsi P. Hospital Lehututu H. Post Inalegolo H. Post Ukhwi H. Post Hunhukwi H. Post Make H. Post Monong H. Post Tshane H. Post Zutshwa H. Post	O. Seno, M. Maifala, D. Chilwalo T. Manewe, A. Mulapati M. Sichinga, E. Wabo M. Modisane, Y. Serwe, G. Bengani, G. Thako, E. Morwawakgosi K. Bonang, B. Mogomotsi L. Moselethane K. Lekgatlhane M. Segano E. Mokgethi A. Lekhutlanye F. Tsebe M. Mokgatle

8.16. HIV PREVALENCE BY SITE, 1992 TO 2003

	Country	Population	Urban/Rural	Site	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
1	Botswana	ANC1	Outside major urban areas	Bobirwa										44.0 (n=149)	45.3 (n=286)	49.3 (n=255)
2	Botswana	ANC1	Outside major urban areas	Boteti										36.7 (n=281)	35.6 (n=250)	31.9 (n=260)
3	Botswana	ANC1	Outside major urban areas	Chobe								50.8 (n=120)		39.1 (n=81)	38.4 (n=105)	47.0 (n=115)
4	Botswana	ANC1	Major urban areas	Francistown	23.7	34.2	29.7	39.6	43.1	42.9	43.0	42.7 (n=576)	44.4 (n=702)	49.6 (n=494)	40.2 (n=458)	45.8 (n=593)
5	Botswana	ANC1	Major urban areas	Gaborone	14.9	19.2	27.8	28.7	31.4	34.0	38.1	37.1 (n=480)	36.2 (n=734)	38.6 (n=576)	38.2 (n=666)	44.8 (n=555)
6	Botswana	ANC1	Outside major urban areas	Gantsi		9.5		18.9			22.3			21.8 (159)	18.8 (n=112)	
7	Botswana	ANC1	Outside major urban areas	Goodhope										33.1 (n=96)	26.3 (n=146)	40.9 (n=137)
8	Botswana	ANC1	Outside major urban areas	Hukuntsi										23.3 (n=62)	40.0 (n=182)	28.4 (n=100)
9	Botswana	ANC1	Outside major urban areas	Kgalagadi								21.8 (n=257)		28.5 (n=120)	28.3 (n=172)	28.9 (n=161)
10	Botswana	ANC1	Outside major urban areas	Kgatleng								29.5 (n=271)		24.9 (n=231)	30.9 (n=310)	30.6 (n=353)
11	Botswana	ANC1	Outside major urban areas	Kweneng East									30.4 (n=349)	29.6 (n=540)	29.2 (n=567)	32.1 (n=522)
12	Botswana	ANC1	Outside major urban areas	Kweneng West										25.3 (130)	28.7 (n=158)	27.0 (n=190)
13	Botswana	ANC1	Outside major urban areas	Lobatse										30.6 (n=232)	34.6 (n=241)	32.4 (n=246)
14	Botswana	ANC1	Outside major urban areas	Mahalapye										31.9 (n=336)	39.8 (n=303)	37.4 (n=326)
15	Botswana	ANC1	Outside major urban areas	Nqami/North West										35.8 (n=376)	40.7 (n=253)	38.4 (n=376)
16	Botswana	ANC1	Outside major urban areas	North East										39.9 (n=75)	38.6 (n=196)	40.4 (n=222)
17	Botswana	ANC1	Outside major urban areas	Okavango										40.6 (n=225)	34.2 (n=284)	32.7 (n=328)
18	Botswana	ANC1	Major urban areas	Selebi-Phikwe			27.0		33.1		49.9		50.3 (n=304)	50.0 (n=351)	48.1 (n=372)	52.2 (n=302)
19	Botswana	ANC1	Outside major urban areas	Serowe/Palapye								41.8 (n=268)		41.0 (n=341)	35.2 (n=425)	43.3 (n=389)
20	Botswana	ANC1	Outside major urban areas	South East										32.1 (n=192)	26.5 (n=288)	27.9 (n=306)
21	Botswana	ANC1	Outside major urban areas	Southern			16.0		21.8				40.7 n=(513)	31.5 (n=347)	30.5 (n=363)	25.7 (n=359)
22	Botswana	ANC1	Outside major urban areas	Tutume			23.1		30.0		37.5		35.4 (n=339)	51.1 (n=267)	40.7 (n=370)	37.7 (n=429)



