# The 2012 National Antenatal Sentinel HIV & Herpes Simplex Type-2 Prevalence Survey in South Africa

2012

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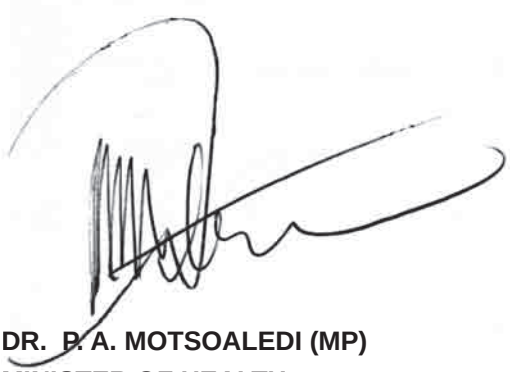
## FOREWORD BY THE MINISTER

From the beginning of the HIV epidemic in South Africa in 1990, the effort to track the epidemic has relied mainly on this antenatal sentinel surveillance to monitor the HIV prevalence trends at national, provincial and district spheres of government. The prevalence of infection gives a snapshot of the magnitude of the disease burden.

In this report, we present the 2012 national, provincial, and district HIV prevalence trends and project HIV estimates to the general population in South Africa. The findings show that the overall national HIV prevalence estimates among 15-49 year pregnant women have remained the same at 29.5% in 2011 and 2012. This annual antenatal HIV surveillance data provides accurate data on HIV prevalence among pregnant 15-24 year old women, where the country is expected to have reduced the HIV prevalence in this age-group by two-thirds by 2015, this is the Millennium Development Goal 6, Target 7, Indicator 18. The diffuse nature of the HIV epidemic underscores the need to continuously enhance our HIV prevention and AIDS treatment modalities. We will continue to collaborate with our Development Partners like World Health Organization and UNAIDS and others to monitor the HIV and AIDS epidemic.

Information generated by an effective HIV surveillance system is essential for us – Government, Health Professionals, Civil Society, Non-Government Organizations, Research and Academic Institutions and International Development Partners in Health, to mount an adequate national response to the HIV and AIDS epidemic. There are many uses of this surveillance data in addition to estimating the magnitude of the epidemic and monitoring its trends at national, provincial, district spheres of government in South Africa. For example, the data is used to strengthen commitment, mobilize communities, and to advocate for sufficient resources to national, provincial and district HIV and AIDS control programmes. Behavioural data are particularly useful for targeting interventions to individuals at higher risk or in geographical areas with a concentration of high-risk behaviour. This surveillance data is essential for planning and evaluating HIV prevention and care activities and for assessing their impact.



**DR. P. A. MOTSOALEDI (MP)**
**MINISTER OF HEALTH**

## AKNOWLEDGEMENTS

I would like to thank everyone who contributed to the successful implementation of this, the 23rd "National 2012 Antenatal Sentinel HIV Prevalence Survey in South Africa.

It is the first time that the National Department of Health is taking further steps to assess other risk exposure factors for HIV infection by piloting a parallel survey to determine the association between HIV exposure and Herpes Simplex Virus type 2 (HSV-2) and the role of HSV-2 as a significant co-factor for HIV transmission. The pilot was conducted in KwaZulu-Natal, Gauteng, Western Cape and Northern Cape Provinces. The support from the Heads of Department of Health in these provinces to conduct this pilot and the initiative from our provincial colleagues is greatly appreciated.

This report would not have been possible without all the pregnant first time antenatal care bookers who agreed to participate in the survey, a warm thank you. My sincere gratitude goes to all the nurses in the public health clinics for their continued dedication and professionalism over the past 23 years in the implementation of this survey.
The National Department of Health's Directorate: Epidemiology plays a pivotal role in the coordination of this survey (conducted in 1 500 clinics, 52 districts and all nine provinces and provincial laboratories) and publication of this report. I would like to thank each of the staff members for their time, passion and enthusiasm in ensuring that the implementation of these annual surveys are a success.

A special, thanks go to Dr. Thabang Mosala, for her key role in providing technical strategic and leadership at all stages of the survey implementation and for leading the technical discussions during data analysis, interpretation of the findings and for writing of this report. Many thanks also go to Ms. Manti Maifadi and Mr. Lusizo Ratya for taking the lead in the overall operational and logistical co-ordination of the survey, for providing technical input in this report and compiling the tables and figures contained in this report. A warm thanks to Ms. Audrey Mbatha for preparing all the maps, Ms. Fulufedzhani Musehane and Mr. Paul Ndala for assisting with the technical support to the provinces, districts and clinics to ensure that the nurses adhere to the survey protocol. Thanks to Ms. Corrie Nagel, Ms. Tinyiko Maluleke and Ms. Norah Moakamedi for their administrative support.

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**MS. M.P. MATSOSO**
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## EXECUTIVE SUMMARY

The history of South Africa's response to the Human Immunodeficiency Virus (HIV) epidemic shows a gradual apprehension of the magnitude of the problem over the last two decades, and faces challenges of providing appropriate management and care for this infectious chronic disease which has reached an epidemic level. Globally, an estimated 34 million people were living with HIV in 2011 (UNAIDS, 2012). Sub-Saharan Africa remains the epicenter of the epidemic and accounts for nearly 70% of the world burden of HIV and AIDS. South Africa is the worst affected country with an estimated 6.1 million people living with HIV in 2012. This is the largest number of People Living HIV in one country in the world.

This was the twenty third (23rd) National Antenatal Sentinel HIV Prevalence Survey in South Africa, conducted across the nine provinces and 52 health districts using the cross-sectional standard unlinked and anonymous design (WHO/UNAIDS Reference Group). This survey is used as a proxy to assess the HIV sero-prevalence among pregnant first bookers aged 15 - 49 years served in public health facilities. The survey was conduct during the month of October in 2012 among pregnant first time antenatal care bookers recruited from 1 497 public health clinics.

The National Department of Health has through this survey also monitored syphilis prevalence trends since 1997. Syphilis prevalence trends were monitored in order to determine its role as a potential co-factor for HIV transmission. The empirical evidence from this survey has however over the years shown that there is an inverse relationship between HIV prevalence and syphilis prevalence. Based on the previous year's (i.e. since 1997) syphilis prevalence trends findings, in 2012 the National Department of Health conducted a pilot survey to investigate whether there is association between HIV and HSV-2 in four provinces.

The pilot HSV-2 survey was conducted in four selected provinces; two with very high HIV prevalence rates but low syphilis prevalence rates, namely: KwaZulu-Natal and Gauteng; and two with the lowest HIV prevalence rates but high syphilis prevalence rates, namely: Northern Cape Province and Western Cape Province. In these four provinces blood samples were screened for both HIV and HSV-2. In the five remaining provinces i.e. Eastern Cape, Free State, Limpopo, Mpumalanga and North West, blood samples were only tested for HIV.

### THE NATIONAL HIV PREVALENCE ESTIMATE IN 2012

In 2012, the overall HIV prevalence estimate among antenatal women was 29.5% (95% CI: 28.8 - 30.2%) which shows stabilization. The national HIV prevalence estimate has remained the same, at 29.5% (95%CI: 28.7 – 30.2%) as recorded in 2011.

The UNAIDS EPP and Spectrum model estimated that in 2012 the South African national HIV prevalence in the general population was 17.9%. UNAIDS also estimated that 6.1 million [5.8million – 6.4million] people were living with HIV including an estimated 410 000 children under 15 years.

### HIV INCIDENCE ESTIMATES PROJECTED IN THE GENERAL POPULATION, 2012

According to UNAIDS Spectrum model, there were an estimated 370,000 new infections in 2012. HIV incidence among adults aged 15 - 49 years was 1.37% persons per year in 2012 while the number of new HIV infections among children under 15 years declined substantially to an estimated 21,000 in 2012. The declining trends can be attributed to the acceleration of Prevention of Mother-to-Child Transmission services.

### HIV PREVALENCE ESTMIMATES BY PROVINCE, 2012

The 2012 provincial HIV prevalence estimates have remained largely unchanged when compared to 2011. In the past twenty three (23) years, the highest HIV prevalence among the 15 - 49 year olds has been recorded in KwaZulu-Natal which has remained stable at 37.4% in 2011 and 2012, followed by Mpumalanga and Free State with overall prevalence rates greater than 30.0%. The lowest HIV prevalence rates were recorded in the Western Cape, Northern Cape and Limpopo. North West, Limpopo, the Eastern Cape recorded HIV prevalence of between 20.0% and 30.0%. The Northern Cape and Western Cape are the only provinces that recorded HIV prevalence below 20.0%

### HIV PREVALENCE ESTIMATES IN THE 52 DISTRICTS, 2012

The number of districts that recorded HIV prevalence above the national estimate (29.5%) has increased from 23 of the 52 districts in 2010 to 27 out of the 52 districts in 2012. Similarly, the number of districts recording HIV

prevalence between 30% and 40 % has increased from 19 out of 52 in 2011 to 23 out of the 52 districts in 2012. What is of significance to note and encouraging is that, the number of districts recording HIV prevalence above 40% has decreased from 5 out of 52 in 2011 to 2 out of 52 in 2012.

The only two districts that have recorded HIV of more than 40% in South Africa are uMgungundlovu (40.7%) in KwaZulu-Natal and Gert Sibande (40.5%) in Mpumalanga. It was also observed that West Rand district now fell among the top ten districts with the highest HIV prevalence, a first time for a district in Gauteng province.

Eight out of 11 districts in KwaZulu-Natal are among the top ten districts with the highest HIV prevalence in the country. uMkhanyakude district has recorded a dramatic HIV prevalence decrease of 5.9% from 41.1% in 2011 to 35.2% in 2012. uMzinyathi district has recorded an increase of 5.5% in HIV prevalence from 24.6% in 2011 to 30.1% in 2012. The district level HIV epidemic remains significantly heterogeneous, with prevalence ranging from a low of 1.5% in Namaqua in the Northern Cape to a high of 40.7% in uMgungundlovu in KwaZulu-Natal.

## HIV PREVALENCE ESTIMATE BY AGE, 2012

The age group 15 – 24 years is the most important indicator to use to provide evidence when monitoring HIV incidence (new infections). HIV prevalence in this age group has been suggested as a proxy measure for incidence because of sexual onset and hence prevalent infections are assumed to be recent while this age group is less likely to be affected by AIDS mortality. The HIV prevalence among the 15 - 24 year old pregnant women was 21.8 % in 2010 compared with 20.1 % in 2011, a decline of 1.7%. In 2012, the United Nations MDGoal 6, Target 7, Indicator 18 (HIV prevalence among 15 - 24 year old pregnant women) HIV prevalence was 19.3%. This age cohort (15-24 years sexually active youth) constituted 48.2% (N = 16 578) of the survey participants.

Nationally, the HIV prevalence among women in the age group 30 - 34 years remains the highest, with a slight increase from 42.2% in 2011 to 42.8% in 2012. This age group constituted 15.4% of the sampled survey population. The age groups 15 – 19 years, 20 – 24 years and 25 – 29 years show a small decrease in HIV prevalence whereas the older age groups show an increase. The HIV prevalence in the age group 35 - 39 years has increased significantly from 38.4% in 2010 to 40.2% in 2012.

The HIV prevalence among the 40 – 44 years old antenatal women increased from 31.7% in 2011 to 33.2% in 2012. The 45 - 49 years old HIV prevalence has increased from 30.4% in 2011 to 33.1% in 2012. These age groups together with the under 19 years old women are classified as high risk pregnancy group.

The association between different age groups with HIV prevalence was done using the dots-plots method which show that, in all of the 9 provinces the HIV prevalence is highest in the age group 34 - 39 year olds. There is an approximate linear increase in HIV prevalence by increasing age in the younger age groups 15 - 34 years across the provinces.

## THE CORRELATION BETWEEN HSV-2 AND HIV PREVALENCE ESTIMATE

This report presents the findings of the first pilot to determine the association between HIV and HSV-2 conducted in the Gauteng, KwaZulu-Natal, Northern Cape and Western Cape provinces. According to the findings, in all of the four provinces, HSV-2 status is a strong indicator of HIV status among the antenatal women. The results are summarized below.

## HSV-2 PREVALENCE ESTIMATES IN THE PILOT PROVINCES

The overall prevalence of HSV-2 infection among antenatal women presenting at public health care clinics in the four pilot provinces: Gauteng, KwaZulu-Natal, Northern Cape and Western Cape in 2012 was estimated at 55.8% (95%CI: 55.1 – 56.5%). Even though the HSV-2 prevalence is very high among the four provinces, there is clearly provincial heterogeneity with respect to the prevalence. Gauteng and KwaZulu-Natal recorded the highest HSV-2 prevalence at 58.4% and 60.2% respectively. The Northern Cape and Western Cape experienced the lowest prevalence at 47.1% and 46.3% respectively.

## HSV-2 PREVALENCE ESTIMATE BY AGE

There is a clearly significant association between increasing HSV-2 prevalence with increasing age of the woman. The HSV-2 prevalence ranged from 28.4% among the 15 - 19 years old age group to a high of 91.7% among

the 45 - 49 year old antenatal women who participated in the survey. Gauteng and KwaZulu-Natal have similar age profiles and Northern Cape and Western Cape have similar age profiles. This is shown in the dot-plots in the main text of the report.

The age trend in HIV infected women is evident in both HSV-2 positives and negatives but at completely different levels. For HSV-2 positive women, nearly all age groups have HIV prevalence rates that exceed the national 2012 HIV prevalence estimate of 29.5%. The converse is true for HSV-2, where the HSV-2 negative women, the HIV prevalence is below the national HIV prevalence estimate, but far higher than what was observed with syphilis prevalence. Therefore, the level of HIV status according to the age group of the woman is strongly correlated to the woman's HSV-2 status

## HSV-2 PREVALENCE BY DEMOGRAPHIC CHARACTERISTICS

The HSV-2 prevalence estimates differs by population group, with the lowest HSV-2 prevalence recorded among Asians and Whites, followed by Coloured people and the highest prevalence recorded among Africans. According to the findings, HSV-2 prevalence is the same across all settings (rural, peri-urban and urban). However, it was noted that women with older partners have higher HSV-2 prevalence rates than women with younger partners. Hence, increasing age of partner was positively associated with increasing HSV-2 prevalence of the antenatal women.

## HIV PREVALENCE BY PARTICICPANTS HSV-2 STATUS

The findings of this pilot show that there is exceedingly high prevalence of HSV-2 in the HIV positive, compared to HIV negative women, where 89.1% of HSV-2 among HIV positive women compared to 42.5% among the HIV negative. In all of the four provinces, HSV-2 status is a strong indicator of HIV status among the antenatal women.

In conclusion, the 2012 national HIV prevalence estimate has remained stable between 2011 and 2012. Prevalence usually reflects the burden of HIV on the health care system and changes (increases) may be the cumulative effect of many factors that may work individually or collectively to drive the epidemic. Increasing HIV prevalence trends where new infections (incidence) are declining can be attributed to scale up of prevention strategies to reduce HIV exposure and initiating of more people on antiretroviral treatment. The HIV prevalence trends continue to show that women in the 24 years to 39 years old are the most at risk of acquiring HIV infection. The HIV prevention message seem to have more impact on the under 24 years old women that the older women.

The policy decision to pilot the association of HIV and Herpes simplex Type-2 has added significant evidence that show the role of other Sexually Transmitted Infections (STI's) that have not been considered as possible drivers of HIV acquisition. It will be important to roll-out the surveillance of HSV-2 in the remaining provinces i.e. Free State, Mpumalanga, Limpopo, Eastern Cape and North West province, this will inform what policy decision can be made to strengthen HIV prevention strategies in the future.

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## ABBREVIATIONS

| | |
|---|---|
| AIDS | Acquired Immuno Deficiency Syndrome |
| ANC | Antenatal Care Sentinel Survey |
| ART | Anti-retroviral Therapy |
| BoD | Burden of Disease |
| BSS | Behavioral Surveillance Survey |
| CCMT | Comprehensive Care Management and Treatment |
| CI | 95% Confidence Interval |
| COO | Chief Operating Officer |
| DG | Director-General Health |
| DHIS | District Health Information System |
| DoH | Department of Health |
| EC | Eastern Cape |
| ELISA | Enzyme Linked Immuno Sorbet Ancay |
| EPP | Estimation and Projection Package |
| FS | Free State Province |
| GA | Gauteng Province |
| HCW | Health Care Worker |
| HCT | HIV Counseling and Testing |
| HIMME | Health Information Management Monitoring and Evaluation |
| HIV | Human Immunodeficiency Virus |
| HSRC | Human Science Research Council |
| HSV-2 | Herpes Simplex Virus type 2 |
| KZN | KwaZulu-Natal Province |
| LP | Limpopo Province |
| MDG | Millennium Development Goal |
| MEDUNSA | Medical University of South Africa |
| MP | Mpumalanga Province |
| MRC | Medical Research Council |
| NC | Northern Cape Province |
| NDoH | National Department of Health |
| NHC | National Health Council |
| NHLS | National Health Laboratory Service |
| NICD | National Institute for Communicable Diseases |
| NSP | National Strategic Plan for HIV, AIDS and STI and TB 2012-2016 |
| NW | North West Province |
| PCR | Polymerase Chain Reaction |
| PAC | Provincial AIDS Councils |
| PHC | Primary Health Care |
| PMTCT | Prevention of Mother-to-Child Transmission |
| PPS | Probability Proportional to Size |
| PSU | Primary Sampling Unit |
| Prya | Persons per year per annum |
| QA | Quality Assurance |
| SA | South Africa |
| SACEMA | South African Centre of Excellence in Epidemiological Modeling & Analysis |
| SANAC | South Africa National AIDS Council |
| StatsSA | Statistics South Africa |
| STI | Sexually Transmitted Infection |
| UCT | University of Cape Town |
| UKZN | University of KwaZulu-Natal |
| UNAIDS | United Nations Joint Program on HIV & AIDS |
| UNGANC | United Nations General Assembly Special Session on HIV & AIDS |
| UNICEF | United Nations Children's Fund |
| UNISA | University of South Africa |
| UNMDG | United Nations 2001 Millennium Development Goal |
| USAID | United States Agency for International Development |
| WC | Western Cape Province |
| WHO | World Health Organisation |

# CHAPTER 1

## 1. INTRODUCTION

The history of the annual HIV antenatal sentinel prevalence survey in South Africa dates back to 1990 when the department realized that the epidemic was increasing exponentially in the general population. The HIV surveillance tool was developed to monitor HIV trends for strategic interventions and response and policy planning. Since 1990, women attending antenatal care services for their first time in their current pregnancy were requested to participate in the survey in selected public health clinic across the country to assess their HIV status. Initially these sentinel surveys only allowed for national and provincial level estimates. Due to the differences among districts within provinces, with regard to population distribution, poverty levels, access to services etc. the need was identified to have information on HIV prevalence at district level. The survey sites have increased from 461 sites in (1990) to 1 497 sites from (2006). The target sample is 36 000 pregnant women presenting for antenatal care health services for their first time on the current pregnancy, during the month of October each year. These public health clinics (sentinel sites) are located in both urban and rural areas and provide antenatal services to pregnant women living among urban, rural, semi-rural, townships, and informal settlement communities.

### 1.1 The purpose of the survey

The purpose of conducting the annual antenatal sentinel HIV point prevalence survey was to assess the HIV sero-prevalence amongst first time antenatal clinic attendees (seen as a particularly suitable "sentinel" group to represent most closely the HIV prevalence of the generally sexually active part of the population), to assess trends in HIV prevalence over time and to conduct a pilot survey to determine if there is significant correlation between HIV and Herpes simplex-2 among survey participants in Gauteng, KwaZulu-Natal, Northern Cape and Northern Cape provinces.

### 1.2 The general objective

The general objective was to determine the distribution of HIV infection among pregnant women attending public health antenatal clinics at national, province and district levels of the Health Care System, disaggregated by demographic factors, geotype, population group, gravidity, parity, age of partner and by different age categories of the survey participant.

### 1.3 The primary objectives were :

a) To assess HIV sero-prevalence among women attending public sector antenatal clinics;
b) To monitor HIV prevalence over time among women attending public antenatal clinics;
c) To use this annual antenatal sentinel data for extrapolation to estimate and project the HIV sero-prevalence trends and the burden of AIDS in the general population and;
d) To provide scientific evidence to measure progress towards meeting the United Nations Millennium Development Goal 6, Target 7, Indicator 18, which is to report on the HIV prevalence amongst 15-24 year old pregnant women.

### 1.4 The secondary objectives were:

a) To estimate the national HIV prevalence estimate among the antenatal 15 - 49 years old women and those aged under 15 years in the country using pregnant women attending antenatal clinics in public health institutions as a proxy;
b) To determine the geographical distribution pattern of HIV infection among pregnant women attending antenatal clinics in public health clinics at national and provincial level, by district and age categories;
c) To monitor HIV and HSV-2 prevalence in selected pilot provinces namely: KwaZulu-Natal, Western Cape, Gauteng and Northern Cape;
d) To estimate HIV incidence among the adult population 15 - 49 years old at national level in the adult population in South Africa using mathematical models;
e) To estimate HIV prevalence in the general population, in children, men and those who need treatment.

The HIV prevalence results remain one of the most important sources of robust surveillance data to provide a basis for the projection and estimation of the epidemic and measurement of HIV and AIDS prevalence in the general population.

**For the first time the 2012 survey will report on the following:**

a) The prevalence estimate of HSV-2 by province, disaggregated by age, population group and genotype in four pilot provinces namely: KwaZulu-Natal, Western Cape, Gauteng and Northern Cape.
b) To report on the association between HIV and HSV-2 prevalence in the four pilot provinces.

# CHAPTER 2

## METHODOLOGY

This was the twenty third (23rd) National Antenatal Sentinel HIV Prevalence Survey in South Africa, conducted across the nine provinces and 52 health districts using the cross-sectional standard unlinked and anonymous design (WHO/UNAIDS Reference Group). This survey is used as a proxy to assess the HIV sero-prevalence among pregnant first bookers aged 15 - 49 years served in public health facilities. The survey was conduct during the month of October in 2012 among pregnant first time antenatal care bookers recruited from 1 497 public health clinics.

The National Department of Health has through this survey also monitored syphilis prevalence trends since 1997. Syphilis prevalence trends were monitored in order to determine its role as a potential co-factor for HIV transmission. The empirical evidence from this survey has however over the years shown that there is an inverse relationship between HIV prevalence and syphilis prevalence. Based on the previous year's (i.e. since 1997) syphilis prevalence trends findings, in 2012 the National Department of Health conducted a pilot survey to investigate whether there is association between HIV and HSV-2 in four provinces.

The pilot HSV-2 survey was conducted in four selected provinces; two with very high HIV prevalence rates but low syphilis prevalence rates, namely: KwaZulu-Natal and Gauteng; and two with the lowest HIV prevalence rates but high syphilis prevalence rates, namely: Northern Cape Province and Western Cape Province. In these four provinces blood samples were screened for both HIV and HSV-2. In the five remaining provinces i.e. Eastern Cape, Free State, Limpopo, Mpumalanga and North West, blood samples were only tested for HIV only..

### 2.1 Survey Design

The South African annual antenatal HIV prevalence survey is an anonymous, unlinked, cross-sectional survey targeting pregnant women attending antenatal clinics in the public health sector. Only first-time attendees are recruited, to minimize the chance of any woman being included more than once. Since 2006, this survey has expanded its sample population to target 36 000 pregnant women compared with16 000 women targeted between 1990 and 2005. This has expanded the geographic coverage considerably to include a representative sample from all 52 health districts in all the nine provinces and includes urban, peri-urban and rural communities.

### 1.2 Preparatory phase

The protocol and methodology was reviewed with all provincial survey coordinators. In addition, survey workshops were held at the National Department of Health as well as in all nine Provincial Health Departments before the scheduled commencement date of the survey. Participants in these workshops included provincial, district and laboratory survey coordinators, health information officers, data capturers, and health facility nurses. The training covered criteria for selection of the sites, recruitment of pregnant women, data administration, blood sample collection, labeling, storage of samples, sample transportation, HIV and HSV-2 testing, confidentiality and ethical issues, supervision and quality assurance procedures.

### 1.3 Sampling

#### 1.3.1 Sentinel population

Pregnant women attending antenatal care services at public health facilities were recruited to participate in the survey as this target group is part of the sexually active population. The antenatal care pregnant women constitute an easily accessible and engage in unsafe HIV risk behavior. In addition, it is routine to obtain antenatal care at facilities, where full intravenous blood as part of routine medical services offered to this group.

#### 2.3.2 Selection of survey population

**Inclusion criteria**: All pregnant women attending antenatal clinics for the first time during their current pregnancy were eligible for inclusion.

**Exclusion criteria**: Pregnant women who had previously visited antenatal clinics during their current pregnancy during the survey period were excluded (to avoid duplicate sampling during the same month). No pregnant women were excluded from participation on the basis of their known HIV status.

#### 2.3.3 Selection of sentinel surveillance sites

The basic goal was to select sentinel surveillance sites representative of the population size estimate of the area to be surveyed. Sentinel sites were selected using the 'Probability Proportional to Size' (PPS) method as this combines a random approach with a bias towards the larger clinics.

### 2.3.4 Selection of Primary Sampling Units (PSU)

The following are the criteria that were applied in selecting sentinel surveillance sites to be eligible for inclusion in the sample:

a) Any randomly selected health facility in the public health sector, providing antenatal care services and routinely drawing blood from attendees on the first visit of the current pregnancy with facilities to store sera at 4˚C;
b) The sentinel site should provide ANC services to sufficient first time antenatal clinic attendees to ensure that a minimum of 20 first time bookers be recruited over one month;
c) Availability of transport arrangements in place that will allow for biological specimens to be taken to a reference laboratory within 24 hours or if the blood samples are centrifuged then transferred to referral laboratory within 72 hours.
d) The clinic staff must be willing to cooperate and have the capacity to conduct the survey.

It should be noted that no other criteria were applied in selecting sites. In particular, sites were not selected specifically to monitor either high risk or low risk sub-populations, nor with the aim of monitoring interventions.

## 2.4 Sample collection

Full blood analysis for pregnant first bookers at the ANC clinic was used as an entry point for HIV testing using anonymous unlinked procedures. One blood sample was taken by vein- puncture and labeled with the bar code number of the individual pregnant woman and stored at 4ºC. The demographic details of the participants, with the exclusion of any particulars from which it may be possible to ascertain the identity of a patient, were collected using a standardized data collection form. The data collection form with the woman's demographic details was labeled with the same bar code number. At the close of each day the supervisors checked the forms against the blood samples for any mistakes and for completeness. The samples, together with the forms, were transported in a cooler box to the participating provincial laboratory where HIV testing was done. HSV-2 testing was done centrally at the NICD.

## 2.5 Laboratory techniques

### 2.5.1 Blood specimen testing for HIV

In accordance with the recommendations of the WHO on HIV screening for surveillance purposes, blood samples were tested with one ELISA (Abbot Axysm System for HIV-1; HIV-2) Assay. Participating laboratories included the NICD, National Health Laboratory Services (NHLS) laboratories in Bloemfontein, Kimberley, Ermelo, Port Elizabeth, Medunsa, Tygerburg Hospital, and Inkosi Albert Luthuli Hospital in KwaZulu-Natal.

### 2.5.2 Blood specimen testing for HSV-type 2

Blood specimen testing for HSV-2 IgG was analysed centrally at the NICD. Human IgG class antibodies to HSV-2 in human sera were detected using the Focus HerpesSelect 2 ® ELISA IgG Diagnostic kit. Diluted serum or plasma samples and controls were incubated in polystyrene micro wells coated with recombinant HSV-2 antigen to allow specific antibody in the serum to react with antigen. Conjugate was added to react with specific IgG antibodies and non-specific reactants were removed by washing. The resultant colour change was quantified by the reading of the optical density (OD). The OD and index values were captured into an Excel spreadsheet and using defined criteria the results were reported as positive or negative for HSV-2 antibodies.

### 2.5.3 Quality Assurance

The pathogen characterization and quality assurance for the sensitivity and specificity of the diagnostics methods used for both HIV and HSV-2 was conducted using the standard NHLS Quality assurance guidelines. For the purposes of this survey the NICD was responsible for overall external quality assurance. The NICD compiled a panel of 10 HIV positive and negative sera which was sent to each participating laboratory for analysis. After the completion of the survey the NICD produced a quality assurance report on the performance of the laboratories for HIV. In addition, the NICD provided the results of the most recent EQA for HSV-2 testing.

## 2.6 Survey implementation monitoring

District level monitoring of the sentinel sites was done weekly by a team from the district health office. Provincial coordinators also undertook provincial level monitoring and visited the sites in their province. The national team conducted supervisory visits to at least two districts per province. The main purpose of the sentinel sites technical support visits by the national technical staff was to conduct random checks and to monitor adherence to the protocol.

### 1.7 Data management

The antenatal sentinel raw data from the original questionnaires were double captured by data capturers at provincial level and staff at participating laboratories using the antenatal HIV prevalence survey DHIS 1.4 patient module. This database is designed with range restrictions to ensure that data captured are not out of range. Extensive internal data validation and verification against the original data capture form were done by each provincial coordinator to ensure that the data is verified, plausible and accurate. Further data cleaning, validation and quality checks were done by the national technical staff.

The overall data analysis (when all data are pooled) was carried out by independent statisticians, actuarial scientists, demographers and epidemiologists from the Epidemiology Directorate, MRC, WHO, UNAIDS, UCT and SACEMA. The analysis was descriptive, followed by bivariate analysis and DOT-plot analysis which focused on determining HIV and HSV-2 prevalence distribution at national, provincial, district and association of the HIV and HSV-2 outcome with the socio-economic and demographic variables of the participants.

The following entries were excluded from the analysis:

a) Those which had no HIV and HSV-2 result.
b) Those where the age of the survey participant was not captured at the sentinel site

For the 95% confidence intervals, the normal approximation to the binomial distribution was used. In a few cases where the sample size or prevalence was small, the exact binomial calculation was used and adjusted for the design effect of the domain.

The national estimate was weighted according to the total number of women aged 15 - 49 years in the different provinces using the 2012 StatsSA mid-year population estimates current at the time of the survey. Given that the sentinel sites were chosen on a probability proportional to size basis by district, the sampling period was fixed and the districts are self-weighting, the provincial prevalence estimates were calculated as the total of the results from the districts in the provinces.

The preliminary HIV and HSV-2 prevalence estimates were discussed with all provincial survey coordinators and members of the HIV Expert Task Team and consensus taken on 95% Confidence Intervals before the report was finalized.

### 2.9 Extrapolation of HIV infection to the general population – UNAIDS EPP & Spectrum models

#### 2.9.1 WHO/UNAIDS estimation process

The national EPP and Spectrum HIV estimations and projections are generated periodically through epidemiological analysis and modelling. South Africa recently completed the estimation process with the overarching aim of generating national HIV estimates and projections for 2012 and projections to 2016. The estimation process was carried out between March and August 2013, led by a national estimation team *viz*: Members of the estimation team comprised of demographers, epidemiologists, medical doctors and public health specialists drawn from NDOH, STATSSA, NICD, HSRC, CDC, UNICEF, WHO and USAID. The estimation team undertook several revisions of the national spectrum file, including disaggregation of antenatal care HIV surveillance data by site and back-dating the data to run from 1990, updating of the treatment numbers, and building assumptions about the future treatment program based on current coverage and targets. The latest tools and methods recommended by the Global Reference Group on Estimations, Projections and Modelling were adapted and customised adequately to suit the South Africa epidemic and country requirements was constituted under the leadership of UNAIDS.

The South Africa 2012 national and provincial Spectrum HIV estimates made use of the most recent and comprehensive sets of epidemiological, demographic and programme data from surveys, surveillance and the DHIS. These estimates provide updated information on the current state of HIV epidemic in South Africa and provide a glimpse of future needs and impact. They provide direction on the pattern of spread, levels and trends of the HIV epidemic at national and provincial levels and throw light on HIV and AIDS strategic programme needs for future planning.

#### A. Adjusting HIV prevalence curve using EPP

For South Africa:

a) Adjusting for population group based relative attendance rates at public health facilities antenatal care services - based on population group standardized prevalence.
b) Adjusting for the use of HIV prevalence among pregnant women - based on the ratio of prevalence among adults in the general population, using data from the national population based HIV survey conducted periodically every 3 years since 2002 and the HIV annual antenatal sentinel prevalence survey among pregnant women conducted since 1990.

**B. Required inputs in Spectrum and epidemiologic assumptions**

The following country data was used in Spectrum:

a) Demographic data projected by age and sex over the time period of interest (2012 StatsSA mid-year estimates).
b) Adult prevalence data from repeated population based surveys and antenatal surveillance data.
c) PMTCT data – number of women receiving PMTCT in 2012.
d) Adult ART data – disaggregated by sex in 2012.
e) Children initiated on ART data in 2012.

Epidemiologic assumptions factored into the Spectrum model:

a) Effect of HIV on fertility.
b) Progression from infection to need for treatment and HIV/AIDS related death.
c) Age distribution of HIV infections.
d) Sex ratio of HIV incidence.
e) Mother-to-child transmission rates by regimen (Mono and Dual therapy) and infant feeding options for PMTCT mothers.
f) Effect of child ART treatment.
g) Assumptions about treatment coverage in the future.
h) CD4 count distribution at national, provincial and district level.

## 2.10 National population based HIV surveys vs. sentinel antenatal HIV surveillance

Sentinel surveillance and population-based surveys each have strengths and weaknesses but taken together provide complementary information and can provide a clear picture of both overall trends and geographic distribution of HIV in South Africa.

**Sentinel Antenatal HIV Surveys**

- **Strengths**
  - Easy access to a cross-section of sexually active women from the general population.
  - Testing among pregnant women is a good proxy for prevalence in the general population.
  - Provides data on trends in the HIV epidemic over time.
  - Biases are recognized and can be corrected.
  - Geographical coverage can be expanded.

- **Weaknesses**
  - Women attending ANC may not be representative of all pregnant women
  - ANC does not provide data on the prevalence among men.

**National Population Based HIV Surveys**

- **Strengths**
  - Can provide representative estimates of prevalence in the general population (for generalized epidemics) as well as for different subgroups.
  - Results can be used to adjust estimates from antenatal sentinel surveillance.
  - Provides an opportunity to link HIV status with social, behavioral and other biomedical information.

- **Weaknesses**
  - Sampling from households may not adequately represent high risk and mobile populations.
  - Non-response can bias population-based estimates.
  - Population based surveys are expensive and logistically difficult to carry out.

## 2.11 Reliability of the 2012 report results

To ensure that we publish an accurate, credible report which provides reliable scientific HIV surveillance data, the National, Provincial and District Health Departments:

a) Revises the protocol annually with the provincial survey coordinators and laboratory technicians before the implementation of the next survey;
b) Use of the DHIS data capturing module and verification management tool to ensure data verification, validation and plausibility;
c) Include external Biostatisticians, Epidemiologists, Demographers and Actuarial scientists in the independent analysis of the data;
d) Consultation with the provinces and the scientific HIV Surveillance Task Team in order increase the power of test and precision of any inferences that are made with respect to the findings.
e) This report is circulated for internal and external scientific peer-review before publication.

**Ethical considerations**

Participation in the survey was voluntary, where verbal informed consent was obtained for answering the questions on the forms and for collecting the blood samples. For reasons of confidentiality, testing was done on anonymous unlinked samples. A unique bar code was allocated to each participant. The bar code was used to link the demographic and socio-economic variables information with the laboratory results while maintaining anonymity of the survey participant.

# CHAPTER 3

## RESULTS

### 3.1 Participation at facility and individual level

A total of 34 260 (95.2%) out of the targeted 36 000 pregnant first antenatal care bookers attending antenatal care services at selected sentinel public health clinics participated in the survey during October 2012. The survey participants were recruited from 1 497 sentinel public health clinics (Table 1).

**Table 1:** Sampled population distribution by province, 2010 to 2012.

| Province | 2010 | | 2011 | | 2012 | |
|---|---|---|---|---|---|---|
| | N | % | N | % | N | % |
| Eastern Cape | 3 994 | 12.4 | 4 123 | 12.3 | 4 625 | 13.5 |
| Free State | 2 223 | 6.9 | 2 303 | 6.9 | 2 325 | 6.8 |
| Gauteng | 6 714 | 20.8 | 6 960 | 20.8 | 6 862 | 20.0 |
| KwaZulu-Natal | 6 887 | 21.4 | 6 741 | 20.2 | 7 011 | 20.5 |
| Limpopo | 3 117 | 9.7 | 3 665 | 11.0 | 3 579 | 10.5 |
| Mpumalanga | 2 202 | 6.8 | 2 125 | 6.4 | 2 201 | 6.4 |
| North West | 1 963 | 6.1 | 2 357 | 7.1 | 2 457 | 7.2 |
| Northern Cape | 1 144 | 3.6 | 1 128 | 3.4 | 1 190 | 3.5 |
| Western Cape | 3 981 | 12.4 | 4 044 | 12.1 | 4 010 | 11.0 |
| Realized sample size | 32 225 | 90.0 | 33 446 | 92.9 | 34 260 | 95.2 |
| **Target** | **36 000** | **100.0** | **36 000** | **100.0** | **36 000** | **100.0** |

N = Realised sample size

In 2012, a total of 34 260 first time antenatal care pregnant women participated in the survey. The sample realization rate has increased from 32 225 in 2010, 33 446 in 2011 to 34 260 in 2012 of the targeted 36 000 pregnant women attending antenatal care. The sample population realization rate in 2012 was 95.1% and exceeds 70% compliance as outlined in the survey protocol. This was a representative sample to make conclusive inferences on the HIV and HSV-2 prevalence at national, provincial and in the 52 health districts in South Africa and disaggregate according to age, geotype (rural *vs*. urban) and other socio-economic factors.

### 3.2 The demographic characteristics of the survey participants

*National participation rate by age*

The age pattern of the women recruited in the survey was similar to the previous three surveys as presented in Table 2. The age distribution of pregnant women who participated ranged from young adolescents aged 12 years to old women of 53 years as shown below in Table 2 and Figure 1. As in past years, the highest number of pregnant antenatal women who participated in the survey was concentrated in the 20 - 24 year old age group, which in 2012 constituted 29.2% of the sampled population.

Antenatal women older than 39 years and younger than 15 years were under-represented in the survey compared to the 15 to 39 years old. Only two pregnant women who participated in the survey were more than 50 years old. It is a well known clinical fact that women who become pregnant at the age of 40 and young adolescent girls under 15 years are classified as the high risk pregnancy group. In the two age groups, there are anatomical factors and genetic factors like poor knowledge of childhood development factors that could have a negative outcome of the unborn child and the mother.

**Table 2:** Sampled population distribution by age group, 2010 to 2012.

| Age in years | 2010 | | 2011 | | 2012 | |
|---|---|---|---|---|---|---|
| | N | % | N | % | N | % |
| <15 | 121 | 0.4 | 112 | 0.3 | 127 | 0.4 |
| 15 - 19 | 6 171 | 19.2 | 6 289 | 18.8 | 6 578 | 19.2 |
| 20 – 24 | 9 723 | 30.2 | 10 123 | 30.3 | 10 000 | 29.2 |
| 25 – 29 | 7 939 | 24.6 | 8 308 | 24.8 | 8 360 | 24.4 |
| 30 – 34 | 4 690 | 14.6 | 4 989 | 14.9 | 5 263 | 15.4 |
| 35 – 39 | 2 498 | 7.8 | 2 763 | 8.3 | 2 805 | 8.2 |
| 40 – 44 | 703 | 2.2 | 760 | 2.3 | 791 | 2.3 |
| 45 – 49 | 58 | 0.2 | 94 | 0.3 | 68 | 0.2 |
| >49 | 7 | 0.02 | 7 | 0.02 | 2 | 0.01 |
| Not specified | 315 | 1.0 | 1 | 0.0 | 266 | 0.8 |
| **Total** | **32 225** | **100** | **33 446** | **100** | **34 260** | **100.0** |

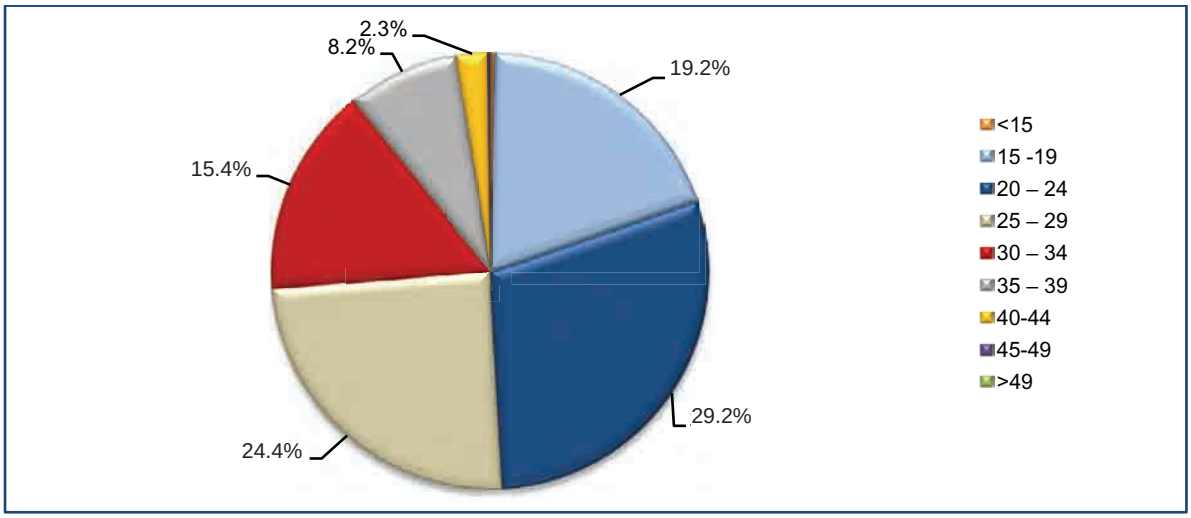



**Figure 1:** National age distribution of survey participants. Total recruited N = 34 260 during October month, 2012.

More than 45% of the survey participants were women less that 24 years of age (48.8%) of these 19.6% are women below 19 years..

*National Participation by population group*

The distribution by population group (race) of the women recruited in the 2012 survey was similar to the previous three surveys, Table 3. Eighty nine percent (89.5%) of the survey participants were African women, while 9.1% were

Coloured. Asians and Whites together accounted for only 1.2% of the 34 260 survey participants. The population group of 0.3% survey participants was not recorded on the demographic survey forms.

**Table 3**: Sampled population distribution by population group, 2010 to 2012.

| Population group | 2010 | | 2011 | | 2012 | |
|---|---|---|---|---|---|---|
| | N | % | N | % | N | % |
| African | 28 533 | 88.5 | 30 053 | 89.9 | 30 645 | **89.5** |
| Asian | 144 | 0.5 | 148 | 0.4 | 188 | **0.6** |
| Coloured | 2 930 | 9.1 | 3 047 | 9.1 | 3 122 | **9.1** |
| White | 166 | 0.5 | 179 | 0.5 | 188 | **0.6** |
| Not recorded | 452 | 1.4 | 19 | 0.06 | 117 | **0.3** |
| **Total** | **32 225** | **100.0** | **33 446** | **100.0** | **34 260** | **100.0** |

### 3.3 THE NATIONAL HIV PREVALENCE TRENDS, SOUTH AFRICA (1990 – 2012)

The 2012 national HIV prevalence estimate among antenatal women was 29.5% (95% CI: 28.8 – 30.2%) and has remained unchanged at 29.5% (95% CI: 28.7 – 30.2%) recorded in 2011.

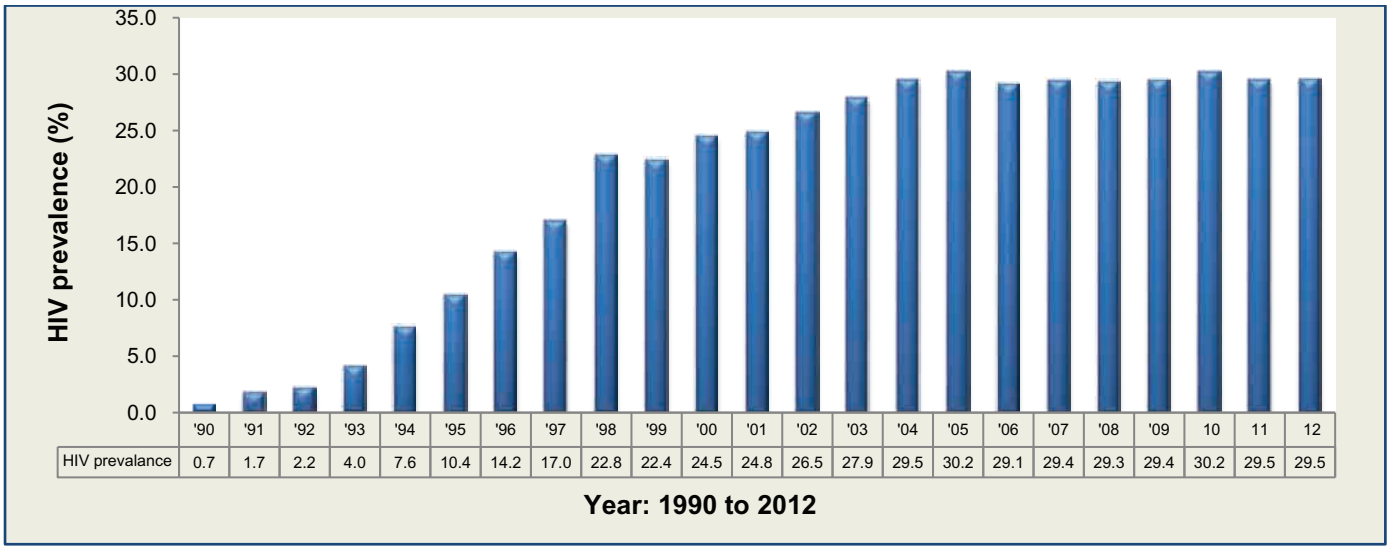



**Figure 2:** HIV prevalence trends among antenatal women, South Africa, 1990 to 2012. (*Source*: NDoH, 2013)

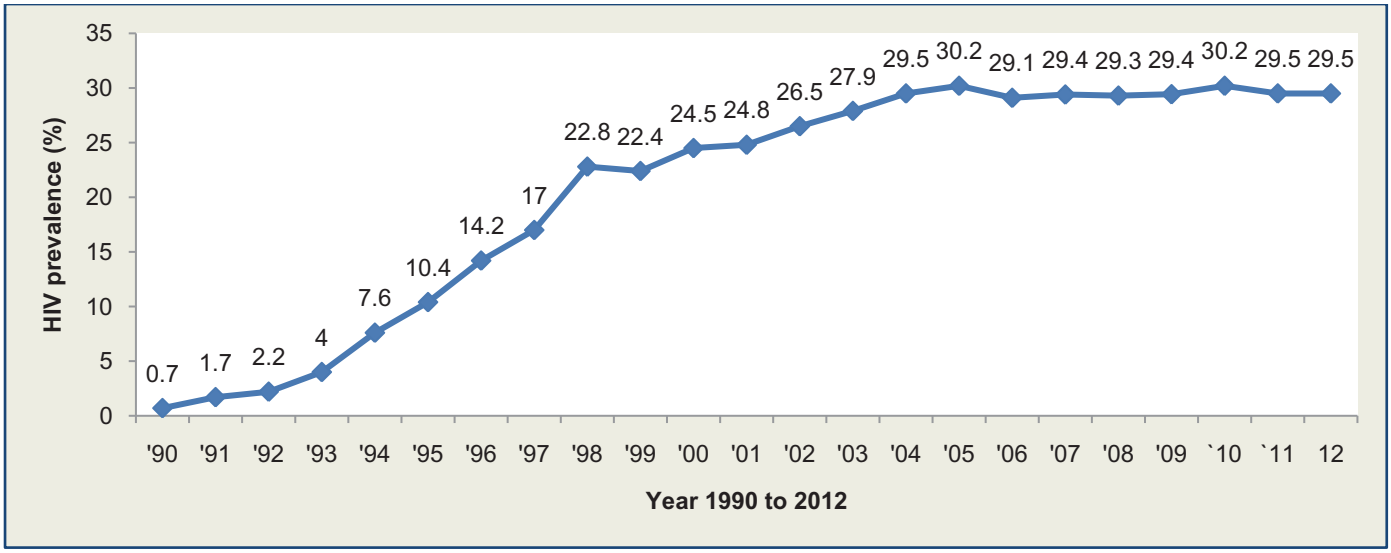



**Figure 3:** The HIV prevalence epidemic curve among antenatal women, South Africa, 1990 to 2012 (*Source*: NDoH, 2013)

The HIV prevalence trends from 2006 to 2012 shows that the national HIV prevalence estimate has been stable over the past 7 years. The HIV epidemic curve showing the plateauing of the epidemic since 2007 is shown in Figure 3 and the 6 data-set points shown in Figure 4.

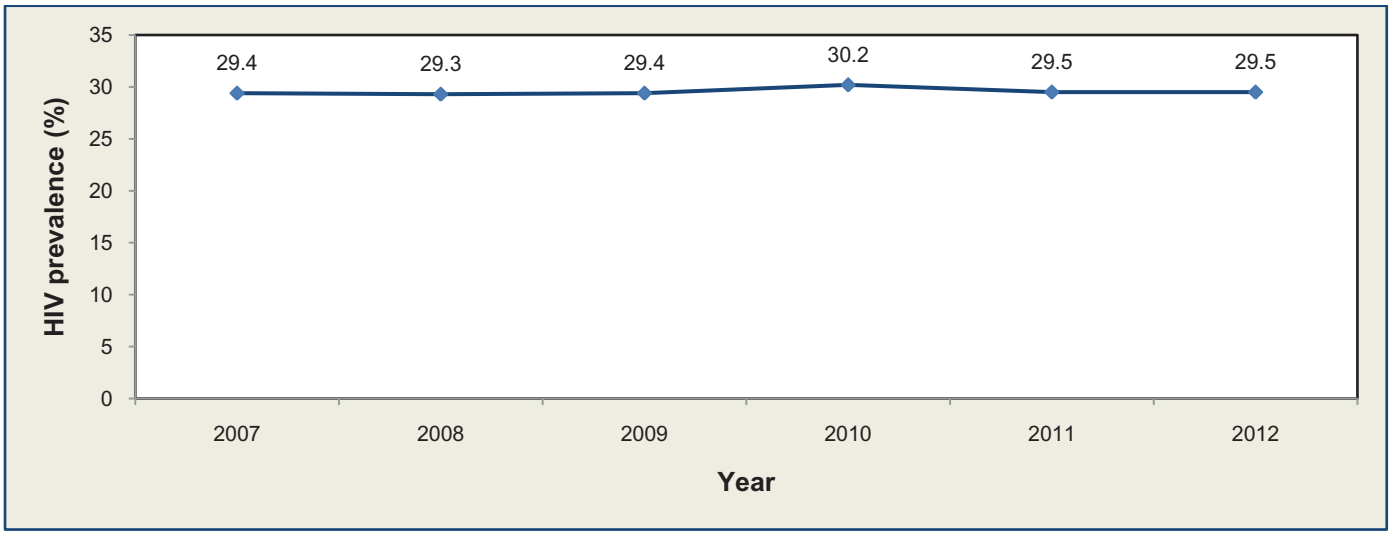



**Figure 4:** The six data set points that show the plateauing of the HIV curve from 2007 to 2012. (*Source*: NDoH, 2013)

### 3.4 HIV PREVALENCE BY PROVINCE - 2010 TO 2012

Five provinces (Free State, Gauteng, KwaZulu-Natal, Mpumalanga and North West) out of the nine have recorded HIV prevalence estimate above the national estimate of 29.5%. The 2012 provincial HIV prevalence estimates have remained largely unchanged when compared to 2011 as shown in Table 4 and Figure 5. In the past twenty three years the highest HIV prevalence among the 15 - 49 year olds has been recorded in KwaZulu-Natal which remained stable at 37.4% (95%CI: 35.8 - 39.0%) in 2011 and also recorded 37.4% (95% CI: 36.0 - 38.7%) in 2012. The second highest is Mpumalanga (35.6%) and third highest is Free State province, recording (32.0%) in 2012.

**Table 4**: HIV prevalence estimates among antenatal women by province, 2010 to 2012. (*Source*: NDoH, 2013)

| | 2010 | | | 2011 | | | 2012 | | |
|---|---|---|---|---|---|---|---|---|---|
| | N | % Prev. | 95% CI | N | % Prev. | 95% CI | N | % Prev. | 95% CI |
| **South Africa** | **32 225** | **30.2** | **29.4 – 30.9** | **33 326** | **29.5** | **28.7 – 30.2** | **33 865** | **29.5** | **28.8 – 30.2** |
| Eastern Cape | 3 994 | 29.9 | 28.2 – 31.7 | 4 099 | 29.3 | 27.5 – 31.1 | 4 552 | 29.1 | 27.3 - 30.9 |
| Free State | 2 223 | 30.6 | 28.3 – 33.0 | 2 292 | 32.5 | 30.5 – 34.5 | 2 309 | 32.0 | 29.8 - 34.3 |
| Gauteng | 6 714 | 30.4 | 29.1 – 31.8 | 6 948 | 28.7 | 27.3 – 30.1 | 6 755 | 29.9 | 28.3 - 31.5 |
| KwaZulu-Natal | 6 887 | 39.5 | 38.0 – 41.0 | 6 714 | 37.4 | 35.8 - 39.0 | 6 990 | 37.4 | 36.0 - 38.7 |
| Limpopo | 3 117 | 21.9 | 20.3 – 23.6 | 3 651 | 22.1 | 20.6 – 23.7 | 3 553 | 22.3 | 20.7 - 23.9 |
| Mpumalanga | 2 202 | 35.1 | 32.6 – 37.7 | 2 116 | 36.7 | 34.3 – 39.2 | 2 182 | 35.6 | 33.3 - 37.9 |
| North-West | 1 963 | 29.6 | 27.3 – 31.9 | 2 352 | 30.2 | 28.2 – 32.4 | 2 443 | 29.7 | 27.5 - 32.0 |
| Northern Cape | 1 144 | 18.4 | 16.1 – 21.1 | 1 125 | 17.0 | 14.3 – 20.0 | 1 173 | 17.8 | 15.3 - 20.7 |
| Western Cape | 3 981 | 18.5 | 15.1 – 22.5 | 4 029 | 18.2 | 14.3 – 22.8 | 3 908 | 16.9 | 13.8 – 20.5 |

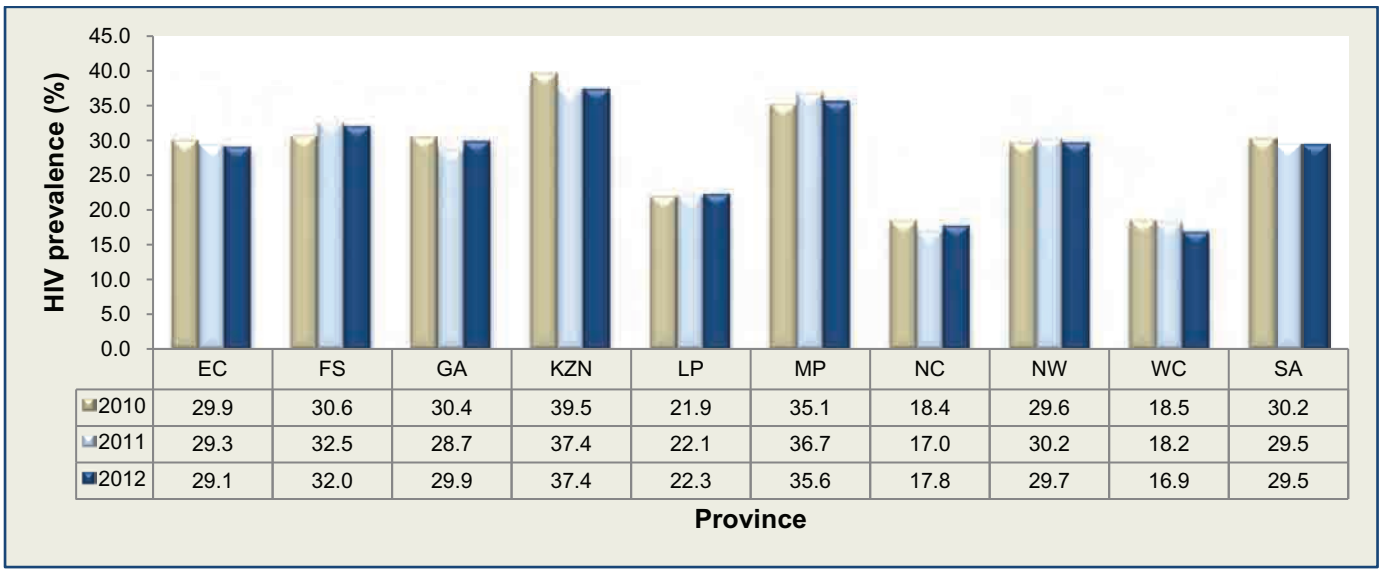



**Figure 5:** HIV prevalence trends among antenatal women by province, SA, 2010 to 2012. (*Source*: NDoH, 2013)

In 2012, the lowest HIV prevalence rates are recorded in the Western Cape (16.9%), Northern Cape (17.8%) and Limpopo (22.3%). North West, Limpopo, the Eastern Cape recorded prevalence's between 20.0% and 30.0%. The Northern Cape and Western Cape are the only provinces that have HIV prevalence's below 20.0% (Figure 6).

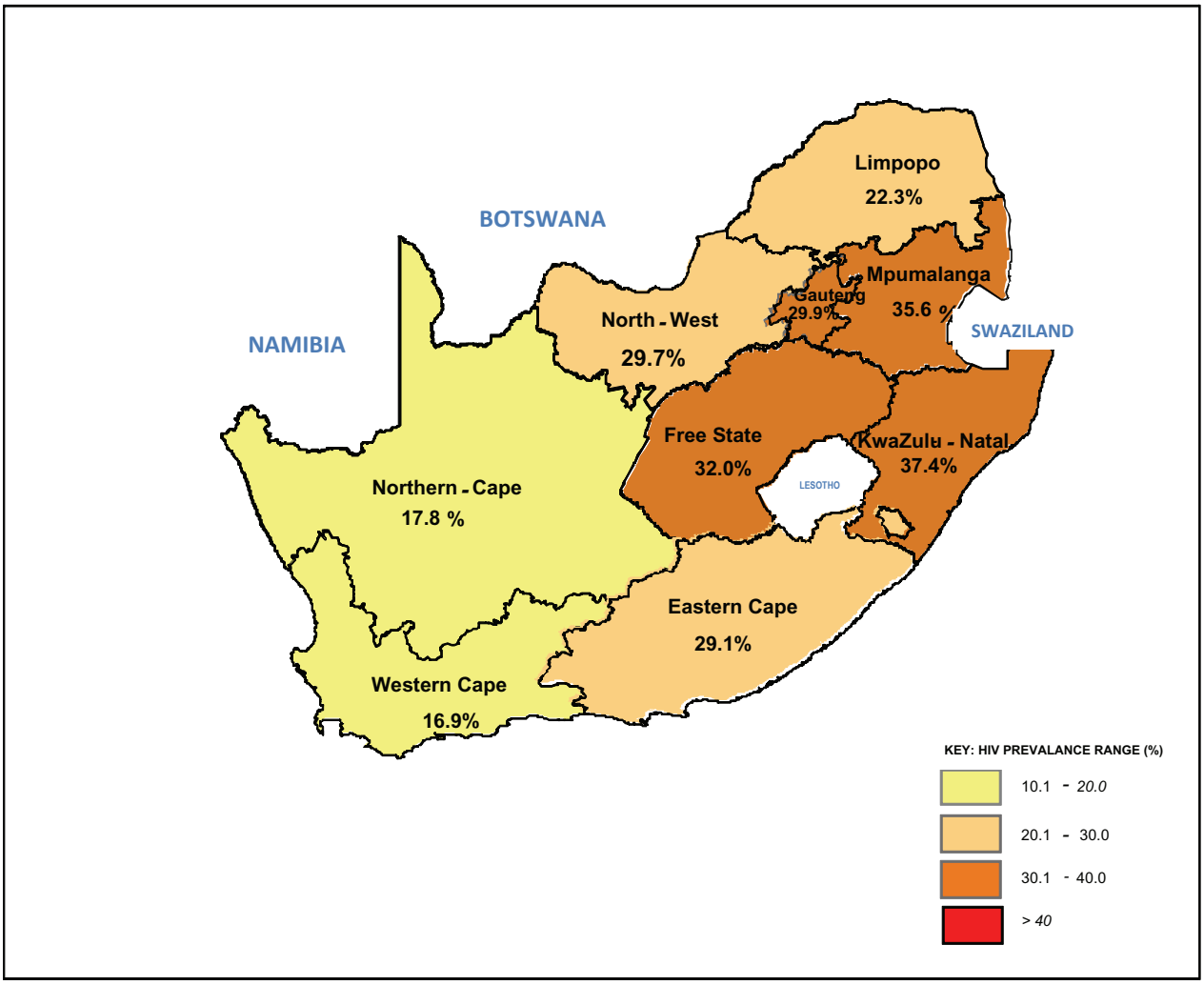



**Figure 6:** HIV prevalence distribution by province, South Africa, 2012. (*Source*: NDoH, 2013)

### 3.5 HIV PREVALENCE BY DISTRICT (2010 – 2012)

The 52 districts level HIV prevalence estimates remain significantly heterogeneous. In 2012 the HIV prevalence estimates ranged from a low of 1.5% in Namaqua in the Northern Cape to a high of 40.7% in UMgungundlovu in KwaZulu-Natal. The 2012 results still show that the highest HIV infection rates are located in the Central and Eastern parts of the country. The HIV prevalence distribution by district among antenatal women in 2012 is presented in Figures 7.

The number of districts that recorded HIV prevalence above the national estimate (29.5%) have increased from 23 in 2010 to 27 in 2012. Similarly, the number of districts recording prevalence's between 30% and 40 % has increased from 19 to 23 out of the 52 districts in 2012. What is encouraging is that the number of districts recording HIV prevalence above 40% has decreased from 5 in 2010 to 2 in 2012. The only two districts out of the 52 that have recorded HIV of more than 40% in South Africa are UMgungundlovu (40.7%) in KwaZulu-Natal and Gert Sibande (40.5%) in Mpumalanga (Figure 8).

It is important to note that due to smaller sample sizes in some districts and due to changes in municipal boundaries in Gauteng and Eastern Cape in the past two years, the sampling error is much larger than the provincial level.

Therefore changes in either direction between years within districts can be expected due to chance, if the sample size was less than 500, and even greater for smaller sample sizes.

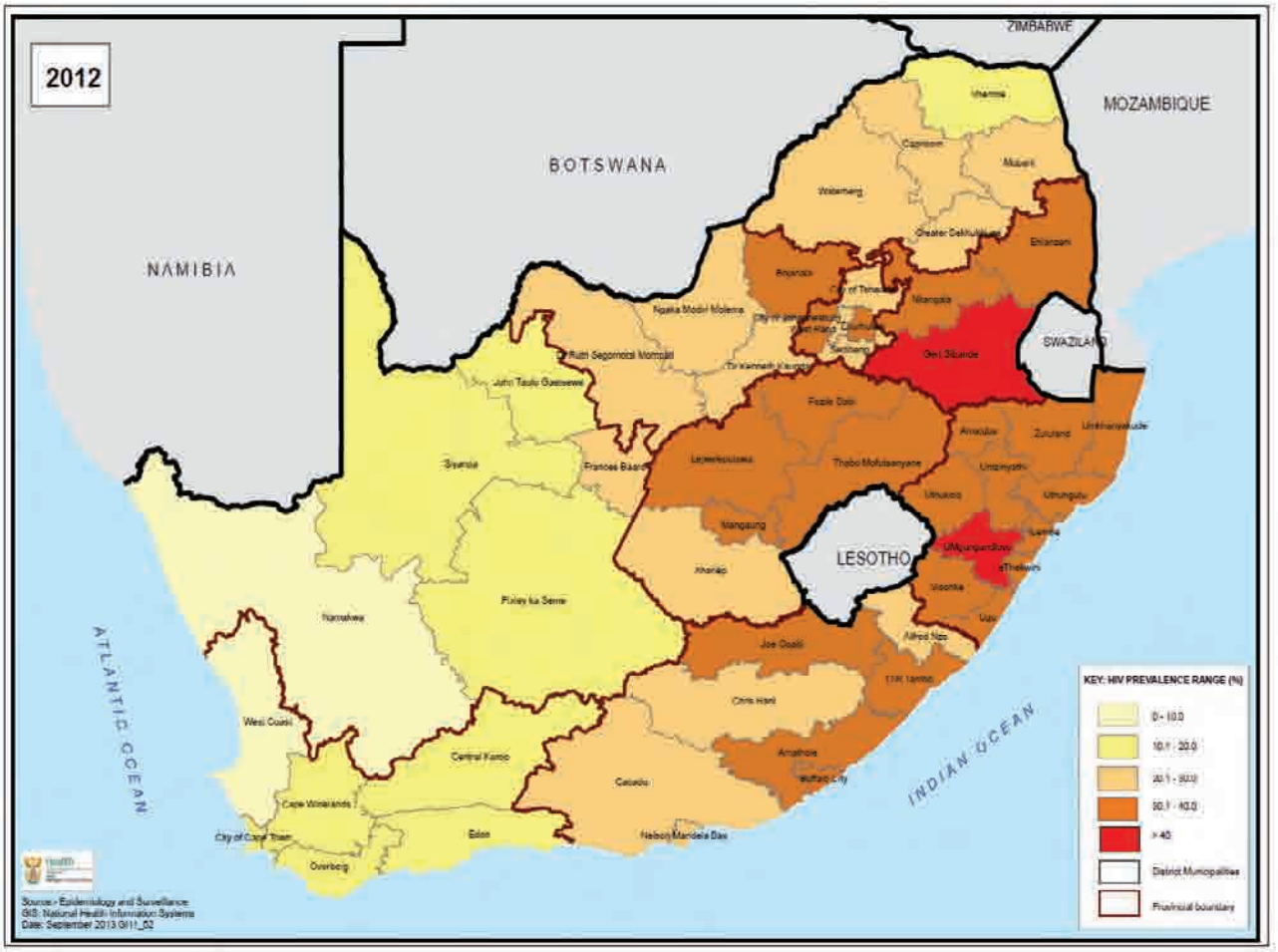



**Figure 7:** Map of the HIV prevalence distribution pattern among antenatal women in the 52 Health districts in South Africa, 2012. (*Source*: NDoH, 2013)

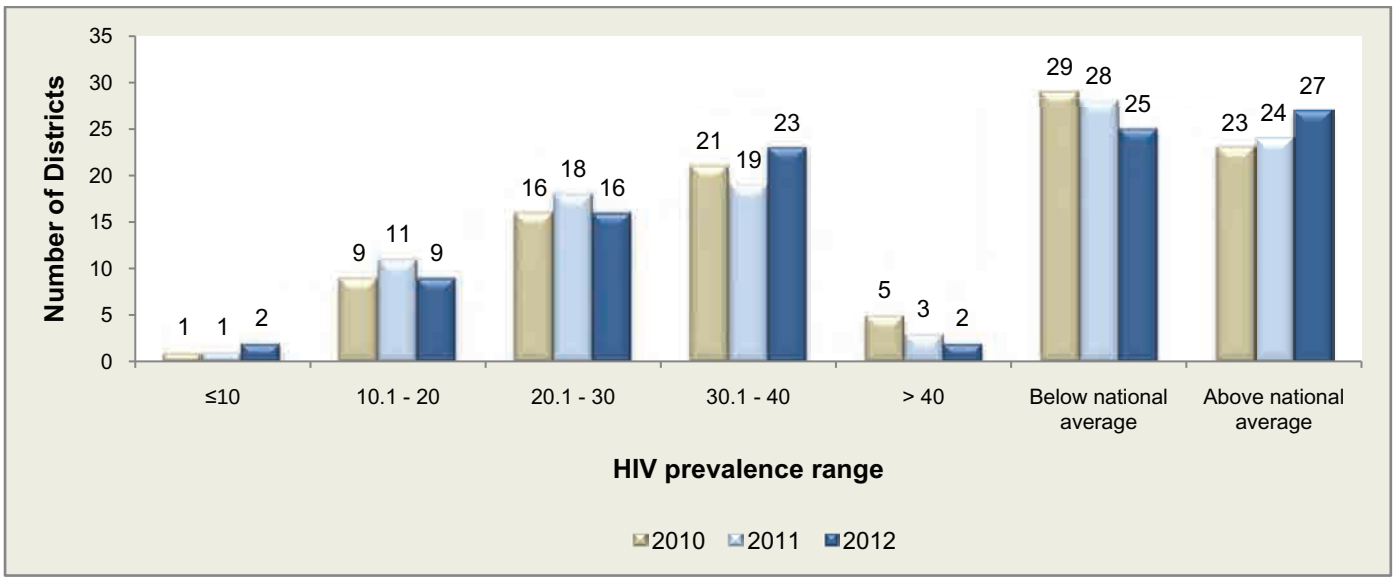



**Figure 8:** Number of districts per HIV prevalence range, 2010, 2011 and 2012. (*Source*: NDoH, 2013)

In 2012, it was the first time for a district located in Gauteng province i.e. West Rand to fall among the top ten districts with the highest HIV prevalence. Eight out of 11 districts in KwaZulu-Natal are among the ten top districts with the highest HIV prevalence in the country, where uMkhanyakude district had recorded a notable HIV prevalence decrease of 5.9% from 41.1% in 2011 to 35.2% in 2012. The uMzinyathi district has recorded an increase of 5.5% in HIV prevalence from 24.6% in 2011 to 30.1% in 2012 (Figure 9a and 9b).

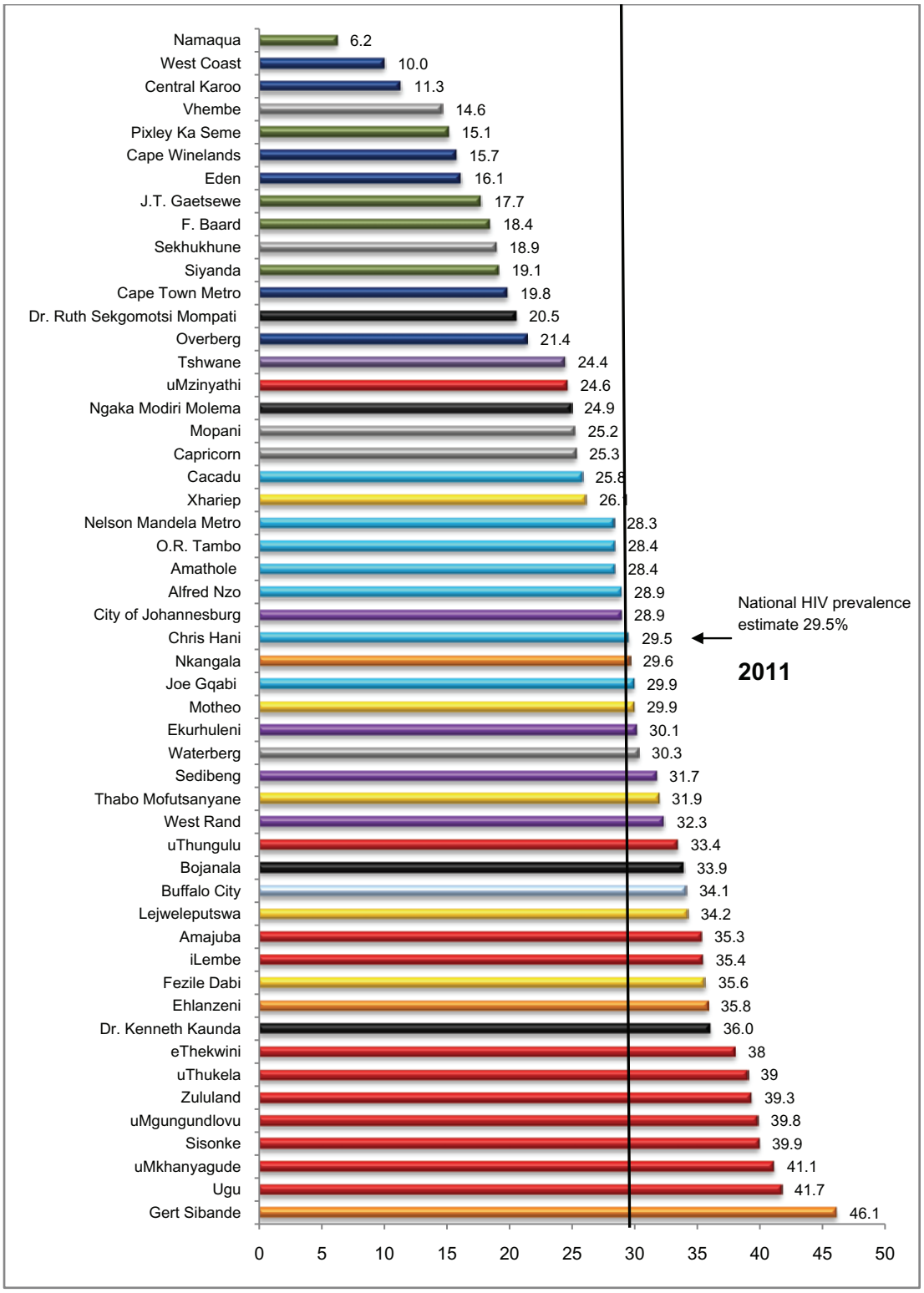



**Figure 9a**: HIV prevalence among antenatal women by district, South Africa, **2011.** (*Source*: NDoH, 2013)

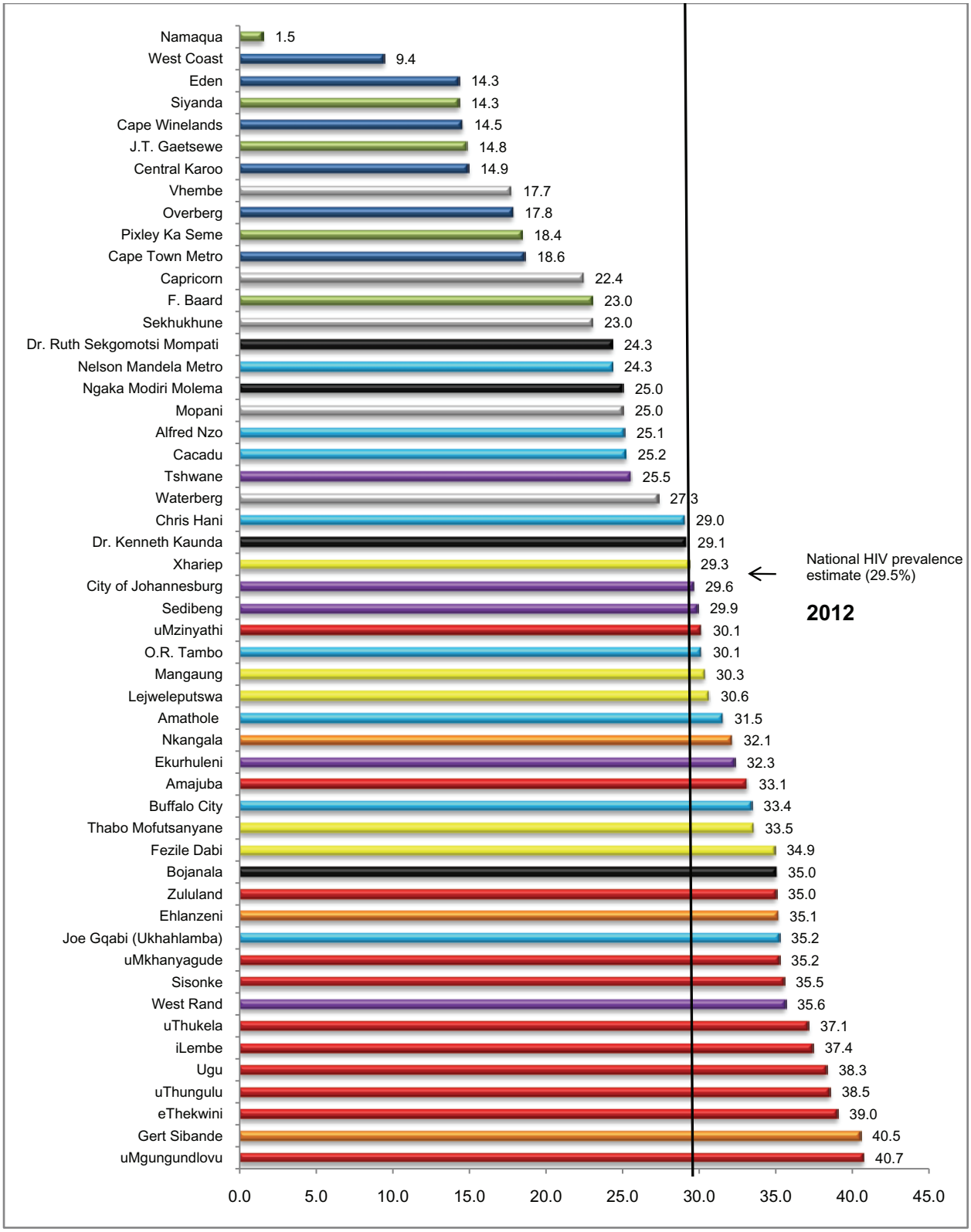



**Figure 9b**: HIV prevalence among antenatal women by district, South Africa, **2012.** (*Source*: NDoH, 2013)

### 3.6 National HIV prevalence distribution by age

The age group 15 - 24 years is the most important indicator to use for providing evidence when monitoring HIV incidence (new infections). HIV prevalence in this age group has been suggested as a proxy measure for incidence

because of sexual onset and hence prevalent infections are assumed to be recent while this age group is less likely to be affected by AIDS mortality. The HIV prevalence among the 15 - 24 year old pregnant women decreased from 21.8% in 2010 to 20.1 % in 2011, a decline of 1.7%. In 2012, 15 - 24 year old pregnant women HIV prevalence was 19.3%. This MDG group constituted 48.4% (N = 16 578) of the survey participants. It is expected that South Africa should report on progress towards achieving the set target of reducing HIV prevalence in this age group by two-thirds from the 2001 baseline prevalence of 23.1%, to an expected UNMDG target of 5.3% in 2015. The findings of monitoring trends in this age group in South Africa show that efforts to achieve the UN MDG target must be significantly strengthened (Table 5 and Figure 10).

**Table 5**: HIV prevalence among antenatal women by age group, South Africa, 2010 to 2012. (*Source*: NDoH, 2013)

| Age group | 2010 | | | 2011 | | | 2012 | | |
|---|---|---|---|---|---|---|---|---|---|
| | N | % Prev. | 95% CI | N | % Prev. | 95% CI | N | % Prev. | 95%CI |
| **<15** | 121 | 9.1 | 4.6 - 15.7 | 112 | 8.0 | 3.7 - 14.7 | 127 | 3.9 | 1.3 - 9.0 |
| **15 -19** | 6 171 | 14 | 13.1 – 14.9 | 6 289 | 12.7 | 11.8 – 13.6 | 6 578 | 12.4 | 11.6 - 13.3 |
| ***15 - 24** | 15 894 | 21.8 | 21.0 – 22.6 | 16 412 | 20.1 | 19.5 – 20.8 | 16 578 | 19.3 | 18.7-19.9 |
| **20 – 24** | 9 723 | 26.7 | 25.7 – 27.8 | 10 123 | 25.3 | 24.3 – 26.4 | 10 000 | 24.2 | 23.3 - 25.2 |
| **25 – 29** | 7 939 | 37.3 | 36.0 – 38.7 | 8 308 | 36.3 | 35.0 – 37.6 | 8 360 | 36.8 | 35.5 - 38.1 |
| **30 – 34** | 4 690 | 42.6 | 40.9 – 44.2 | 4 989 | 42.2 | 40.6 – 43.7 | 5 263 | 42.8 | 41.2 – 44.4 |
| **35 – 39** | 2 498 | 38.4 | 36.3 – 40.5 | 2 763 | 39.4 | 37.4 – 41.4 | 2 805 | 40.2 | 38.3 - 42.0 |
| **40 – 44** | 703 | 30.9 | 27.5 – 34.5 | 760 | 31.7 | 28.3 – 35.2 | 791 | 33.2 | 29.9 - 36.7 |
| **45 – 49** | 58 | 28.2 | 18.1 – 41.2 | 94 | 30.4 | 21.8 – 40.5 | 68 | 33.1 | 22.7 – 45.5 |

* The 15-24 years old antenatal women HIV prevalence (UN MDG 6, Target 7, indicator 18)

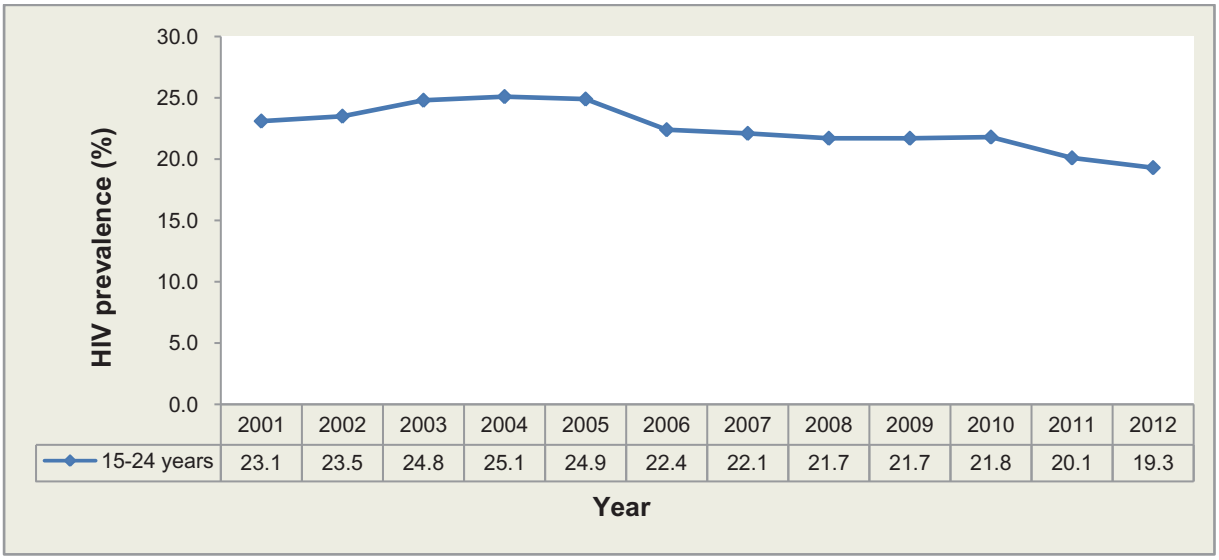
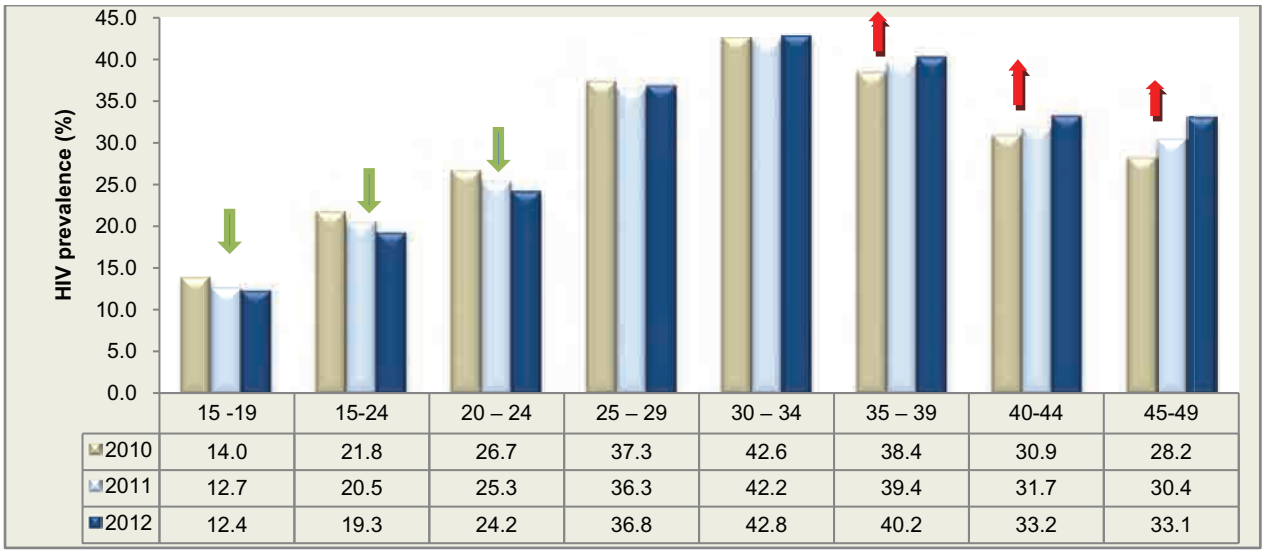



**Figure 10:** The 15 - 24 years old antenatal women (N= 16 705) HIV prevalence (UN MDG 6, Target 7, Indicator 18) from 2001 to 2012. (*Source*: NDoH, 2013)

Nationally, the HIV prevalence among women in the age group 30 - 34 years remains the highest at 42.2% in 2011 and 42.8% in 2012. This age group constituted 15.4% of the sampled survey population (Table 5 and Figure 11).




| | 15 -19 | 15-24 | 20 – 24 | 25 – 29 | 30 – 34 | 35 – 39 | 40-44 | 45-49 |
|---|---|---|---|---|---|---|---|---|
| 2010 | 14.0 | 21.8 | 26.7 | 37.3 | 42.6 | 38.4 | 30.9 | 28.2 |
| 2011 | 12.7 | 20.5 | 25.3 | 36.3 | 42.2 | 39.4 | 31.7 | 30.4 |
| 2012 | 12.4 | 19.3 | 24.2 | 36.8 | 42.8 | 40.2 | 33.2 | 33.1 |

**Figure 11:** HIV prevalence trends among antenatal women by age group, South Africa, 2010 to 2012. (*Source*: NDoH, 2013)

The age groups 15 – 19 years, 20 – 24 years and 25 – 29 years show a small decrease in HIV prevalence whereas the older age groups show an increase. The HIV prevalence in the age group 35 - 39 years has increased significantly from 38.4% in 2010 to 40.2% in 2012. The HIV prevalence among the 40 – 44 years old antenatal women increased from 31.7% in 2011 to 33.2% in 2012. Similarly, the 45 - 49 years old HIV prevalence has increased from 30.4% in 2011 to 33.1% in 2012. These women are classified as high risk pregnancy.

### 3.7 DOTS-PLOT OF HIV PREVALENCE BY AGE BY PROVINCE IN 2012

The HIV prevalence by age group for the nine provinces is shown using dots-plots in Figure 12. The 2012 national antenatal prevalence estimate of 29.5% is shown vertically as a dotted line on each dot-plot. In all of the 9 provinces the HIV prevalence is highest in the age group 34 - 39 year olds. There is an approximate linear increase in the prevalence by increasing age in the younger age groups 15 - 34 years across the provinces.

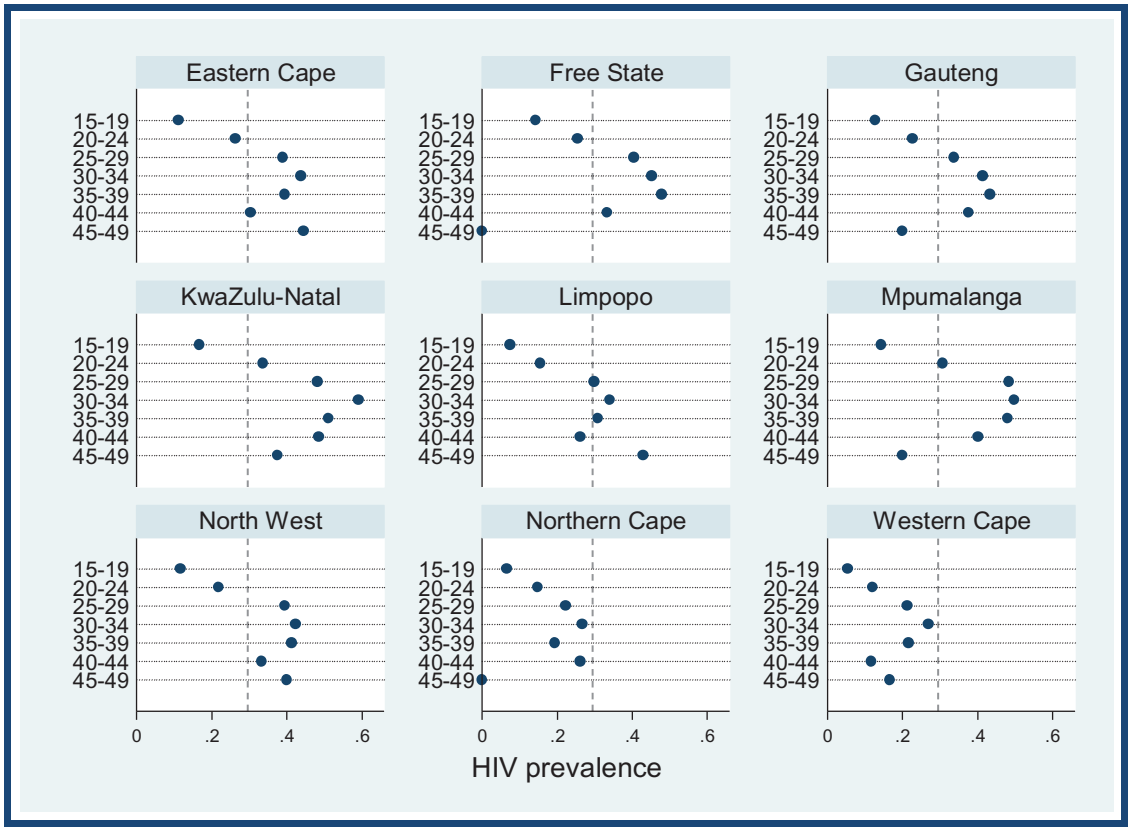



**Figure 12:** Comparison of age specific HIV Prevalence profiles between provinces. (*Source*: NDoH, 2013)

### 3.8 Association between HIV outcome and demographic and socio-economic variables

There are a number of variables that either alone or in combination promote or prevent the risk of acquiring HIV infection. The precise linkages between these different risk factors for the disease are difficult to ascertain and to separate from the effects of other variables. The antenatal survey is not designed to collect comprehensive data on potential risk factors. However, it does include the collection of a number of discrete demographic variables.

#### 3.8.1 HIV prevalence by level of education

The majority (73.9%) of the survey participants had secondary school qualifications with 29.7% of them being HIV positive. These findings showed that most women had the same HIV risk exposure, irrespective of their level of education (Table 6).

#### 3.8.2 HIV prevalence and marital status

More than 75% (N= 25 877) of the survey participants were single women, of which 30.3% were HIV infected, only 19.5% of the 34 260 pregnant women were married and 24.4% of these were HIV infected (Table 6).

#### 3.8.3 Participants knowledge of their own HIV status

Further analysis of the survey data indicates that a high percentage (72.4%, N= 24 800) of the survey participants knew their HIV status of which 30.1% were HIV infected (Table 6).

#### 3.8.4 HIV prevalence and parity

HIV prevalence was the lowest among women who had no children prior the current pregnancy (Table 6).

**Table 6:** Association between the demographic and background characteristics and HIV outcome status of survey participants, 2010 to 2012.

| Variable | | 2010 | | 2011 | | 2012 | |
|---|---|---|---|---|---|---|---|
| | Level | N | % HIV Prev. | N | % HIV Prev. | N | % HIV Prev. |
| Population group | African | 28 533 | 32.5 | 30 053 | 31.4 | 30 345 | 31.7 |
| | Asian | 144 | 7.1 | 148 | 8.8 | 186 | 4.6 |
| | Coloured | 2 930 | 7.0 | 3 047 | 7.6 | 3 069 | 7.5 |
| | White | 166 | 3.0 | 179 | 1.1 | 185 | 2.2 |
| Level of Education | None | 562 | 33.5 | 1 093 | 32.8 | 539 | 33.8 |
| | Primary | 3 786 | 33.3 | 3 667 | 33,7 | 3 717 | 33.9 |
| | Secondary | 24 627 | 30.2 | 25 846 | 28.8 | 25 329 | 29.7 |
| | Tertiary | 2 576 | 22.7 | 2 757 | 22.1 | 3 108 | 22.6 |
| Marital Status | Single | 24 802 | 31.2 | 26 435 | 30.1 | 25 877 | 30.3 |
| | Married | 6 317 | 25.1 | 6 736 | 24.6 | 6 687 | 24.4 |
| | Widowed | 72 | 41.7 | 76 | 50.0 | 68 | 51.5 |
| | Divorced | 105 | 39.0 | 102 | 19.6 | 86 | 22.1 |
| Parity Number of live born children | None | 12 805 | 20.7 | 13 338 | 19.0 | 13 839 | 18.9 |
| | 1 | 10 531 | 35.9 | 10 977 | 34.9 | 10 972 | 34.4 |
| | 2 | 5 324 | 37.7 | 5 543 | 38.3 | 5 821 | 38.8 |
| | 3 | 2 146 | 34.9 | 2 236 | 35.3 | 2 237 | 38.0 |
| | 4 | 763 | 33.4 | 816 | 32.2 | 852 | 33.1 |
| | 5 | 301 | 26.9 | 318 | 28.6 | 294 | 29.6 |
| | 6 | 110 | 28.2 | 125 | 22.4 | 98 | 27.6 |
| | More than 6 | 71 | 21.4 | 55 | 20.0 | 63 | 31.7 |
| Age of Partner | <15 | 2 | 0.0 | 3 | 0.0 | 2 | 0.0 |
| | 15-19 | 1559 | 8.3 | 1 692 | 7.7 | 1895 | 6.9 |
| | 20-24 | 6642 | 17.9 | 7 054 | 15.9 | 7160 | 16.1 |
| | 25-29 | 8510 | 28.9 | 9 174 | 28.4 | 8929 | 27.5 |
| | 30-34 | 6516 | 37.3 | 6 941 | 35.7 | 7159 | 36.3 |
| | 35-39 | 4287 | 41.1 | 4 621 | 40.4 | 4756 | 41.6 |
| | 40-44 | 2101 | 39.4 | 2 256 | 39.2 | 2584 | 37.7 |
| | >45 | 1303 | 35.9 | 1491 | 36.02 | 1456 | 38.3 |
| Aware of their HIV status | Yes | 20 943 | 31.5 | 24 429 | 29.9 | 24 800 | 30.1 |
| | No | 10 173 | 26.9 | 8 852 | 26.4 | 7 982 | 25.6 |

(*Source*: NDoH, 2013)

It is for the first time the antenatal sentinel survey reports on the HIV prevalence distribution by geotype, this is presented in the table below. There is no significant difference in HIV prevalence observed among people that live in rural, urban or peri-urban areas in the country.

**Table 7:** HIV prevalence among antenatal women by geotype, 2012.

| 2012 | | | |
|---|---|---|---|
| **Geotype** | **Number** | **% Prevalence** | **95% CI** |
| Peri-Urban | 254 | 29.5 | 22.0 – 38.2 |
| Rural | 16 235 | 28.6 | 27.7 – 29.6 |
| Urban | 17 376 | 30.3 | 29.2 – 31.5 |

(*Source*: NDoH, 2013)

## 3.9 HIV prevalence trends by individual province

For each province, comparison of the provincial, district level and age distribution HIV prevalence are reported from 2010 to 2012. Due to the smaller sample size in some districts, the sampling error is much larger than at the provincial level. Therefore changes of 4% in either direction between the years within a district can be expected due to chance, if the sample size was less than 500, and even greater for smaller sample sizes.

### 3.9.1 THE EASTERN CAPE PROVINCE

In 2012, the Eastern Cape provincial HIV prevalence amongst antenatal women was 29.1% (95% CI: 27.3 – 30.9%). The estimated overall HIV provincial prevalence in this province has decreased by 0.8% from a high of 29.9% in 2010 as shown by the temporal epidemic curve (Figure 13).

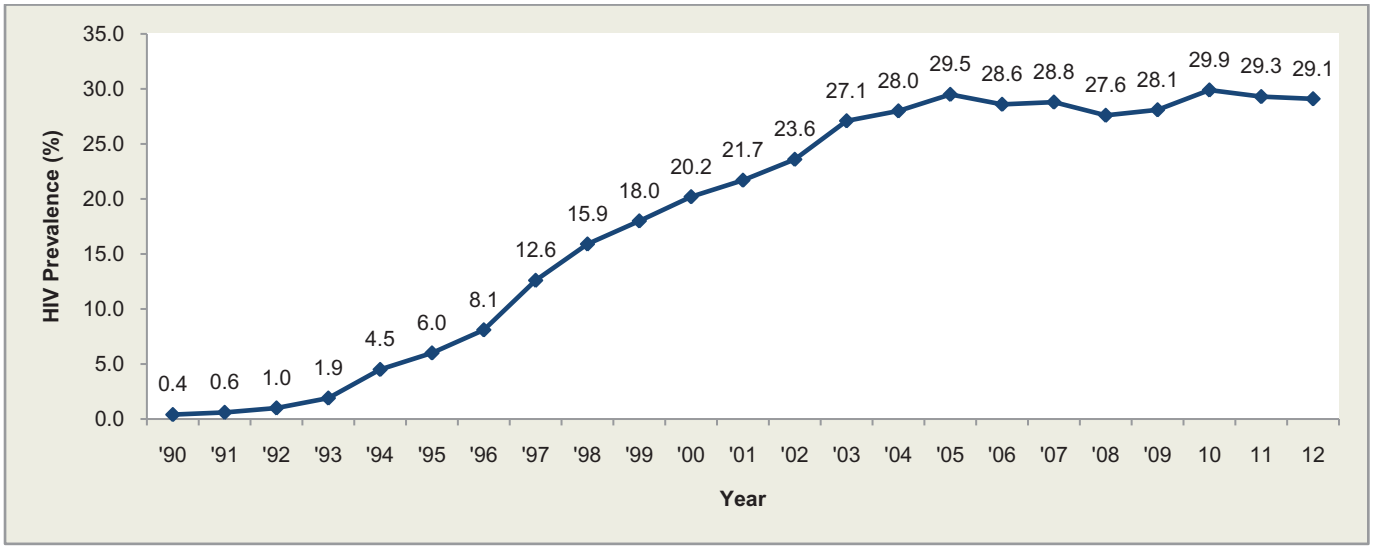


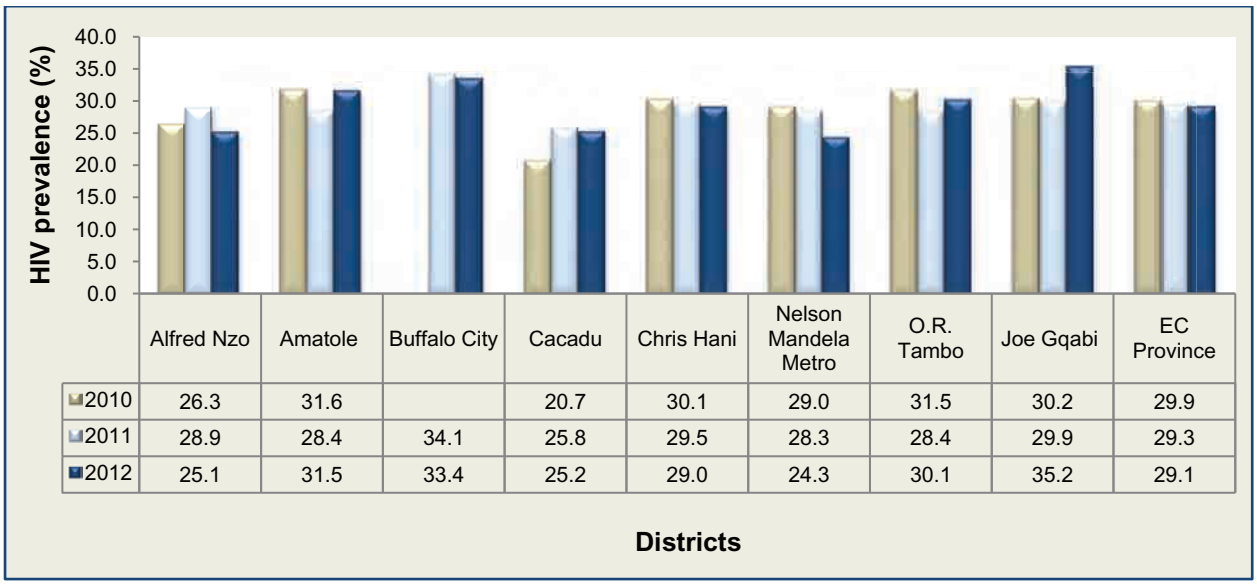

**Figure 13:** HIV epidemic curve among antenatal women, Eastern Cape, 1990 to 2012. (*Source*: NDoH, 2013)

The trends in district prevalence rates from 2010 to 2012 are shown in Table 8 and Figure 14.

In 2012, there were four districts in the Eastern Cape that recorded HIV prevalence above 30% compared to one district in 2011. The lowest HIV prevalence was recorded in Nelson Mandela Metro district and the highest was in Joe Gqabi district (formerly known UKhahlamba), which increased from 30.2% in 2010 to 35.2% in 2012. The O.R. Tambo and Chris Hani district HIV prevalence rate have slightly decreased from 31.5% and 30.1% in 2010 to 30.1% and 29.0% in 2012 respectively. Substantive decreases in HIV prevalence between 2011 and 2012 were recorded in Alfred Nzo and Nelson Mandela Metro.

**Table 8:** HIV prevalence among antenatal women by district in the Eastern Cape, 2010 to 2012

| Eastern Cape | 2010 | | | 2011 | | | 2012 | | |
|---|---|---|---|---|---|---|---|---|---|
| | N | % Prev. | 95% CI | N | % Prev. | 95% CI | N | % Prev. | 95% CI |
| **Provincial** | **3 994** | **29.9** | **28.2 – 31.7** | **4 099** | **29.3** | **27.5 – 31.1** | **4 625** | **29.1** | **27.3 - 30.9** |
| Alfred Nzo | 133 | 26.3 | 21.5 – 31.8 | 439 | 28.9 | 22.9 – 35.9 | 442 | 25.1 | 20.8–30.0 |
| Amathole | 1 029 | 31.6 | 28.7 – 34.6 | 500 | 28,4 | 25.0 – 32.2 | 572 | 31.5 | 28.5 - 34.6 |
| Buffalo City | New Health District | | | 552 | 34.1 | 31.0 – 37.3 | 601 | 33.4 | 28.5 - 38.8 |
| Cacadu | 275 | 20.7 | 14.8 – 28.2 | 252 | 25.8 | 18.5 – 34.8 | 274 | 25.2 | 17.9–34.3 |
| Chris Hani | 548 | 30.1 | 26.5 – 34.0 | 475 | 29.5 | 25.4 – 35.2 | 575 | 29.0 | 24.4–34.1 |
| N. Mandela Metro | 677 | 29.0 | 23.6 – 35.0 | 668 | 28.3 | 22.7 – 34.6 | 799 | 24.3 | 19.2–30.2 |
| O.R. Tambo | 1 097 | 31.5 | 28.5 – 34.7 | 982 | 28.4 | 25.3 – 31.8 | 1 036 | 30.1 | 27.1 - 33.3 |
| Joe Gqabi | 235 | 30.2 | 23.4 – 38.0 | 231 | 29.9 | 25.4 – 34.7 | 253 | 35.2 | 28.4 - 42.7 |




| | Alfred Nzo | Amatole | Buffalo City | Cacadu | Chris Hani | Nelson Mandela Metro | O.R. Tambo | Joe Gqabi | EC Province |
|---|---|---|---|---|---|---|---|---|---|
| 2010 | 26.3 | 31.6 | | 20.7 | 30.1 | 29.0 | 31.5 | 30.2 | 29.9 |
| 2011 | 28.9 | 28.4 | 34.1 | 25.8 | 29.5 | 28.3 | 28.4 | 29.9 | 29.3 |
| 2012 | 25.1 | 31.5 | 33.4 | 25.2 | 29.0 | 24.3 | 30.1 | 35.2 | 29.1 |

**Figure 14:** HIV prevalence trends among antenatal women, Eastern Cape, 2010 to 2012. (*Source*: NDoH, 2013)

The age distribution of pregnant women who participated in the 2012 survey in the Eastern Cape is shown in Figure 15. The majority (29.5%) of the survey participants were women aged 20 – 24 years.

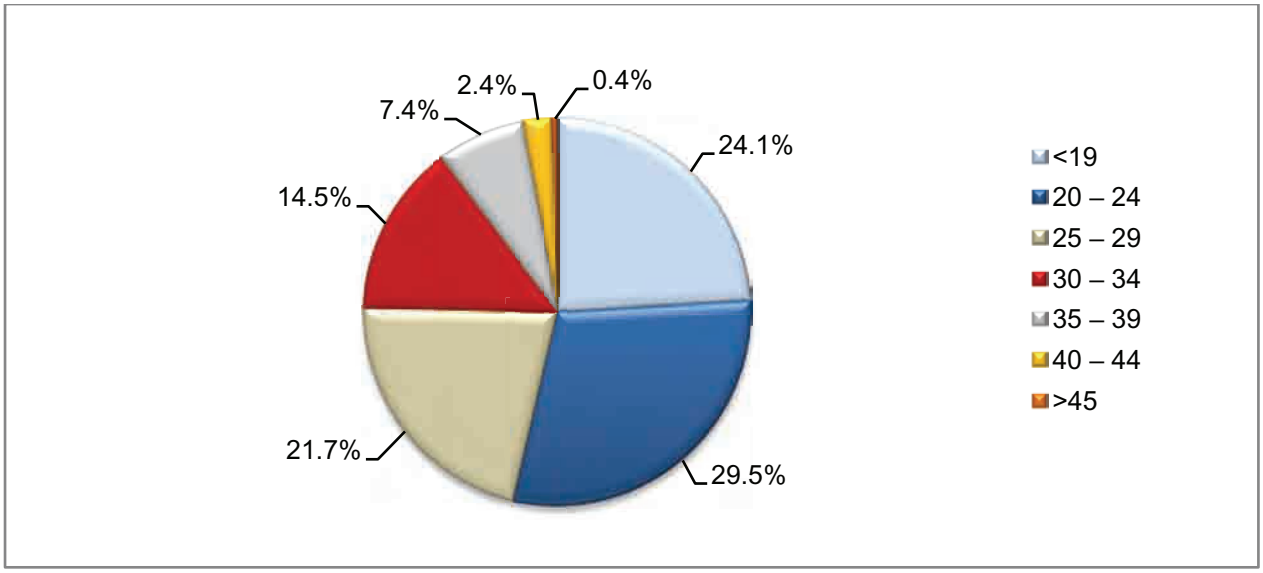



**Figure 15:** Sampled population distribution by age group, Eastern Cape, 2012. (*Source*: NDoH, 2013)

The HIV prevalence among the 15 - 24 year olds (which is the Millennium Development Goal 6, Target 7 indicator 18 group) has decreased slightly from 21.8% in 2010 to 19.4 in 2012 (Table 9). There was stabilization in the HIV prevalence among young women in the age group 15 - 19 years from 12.0% in 2010, 11.2% in 2011 and 11.0% in 2012. Older age group categories in this province have shown an increase in HIV prevalence between 2010 and 2012, but this may be due to smaller sample sizes in these age groups.

**Table 9:** HIV prevalence among antenatal women by age group, Eastern Cape, 2010 to 2012.

| Age group (Years) | 2010 | | 2011 | | 2012 | |
|---|---|---|---|---|---|---|
| | N | % Prev. | N | % Prev. | N | % Prev. |
| <15 | 19 | 0.0 | 24 | 0.0 | 22 | 13.6 |
| 15 -19 | 907 | 12.0 | 992 | 11.2 | 1 080 | 11.0 |
| *15 - 24 | 2 097 | 21.8 | 2 162 | 20.7 | 2 431 | 19.4 |
| 20 – 24 | 1 190 | 29.3 | 1 170 | 28.8 | 1 351 | 26.1 |
| 25 – 29 | 868 | 39.7 | 918 | 35.7 | 994 | 38.9 |
| 30 – 34 | 504 | 44.4 | 571 | 45.7 | 663 | 43.7 |
| 35 – 39 | 324 | 34.6 | 342 | 36.0 | 337 | 39.5 |
| 40 – 44 | 112 | 28.6 | 95 | 37.9 | 109 | 30.3 |
| 45 – 49 | 14 | 21.4 | 11 | 27.3 | 18 | 44.4 |
| >49 | 1 | ** | ** | ** | 2 | 0.0 |

The changes in HIV prevalence distribution in the Eastern Cape province from 2009 to 2012 are shown in Figure 16.

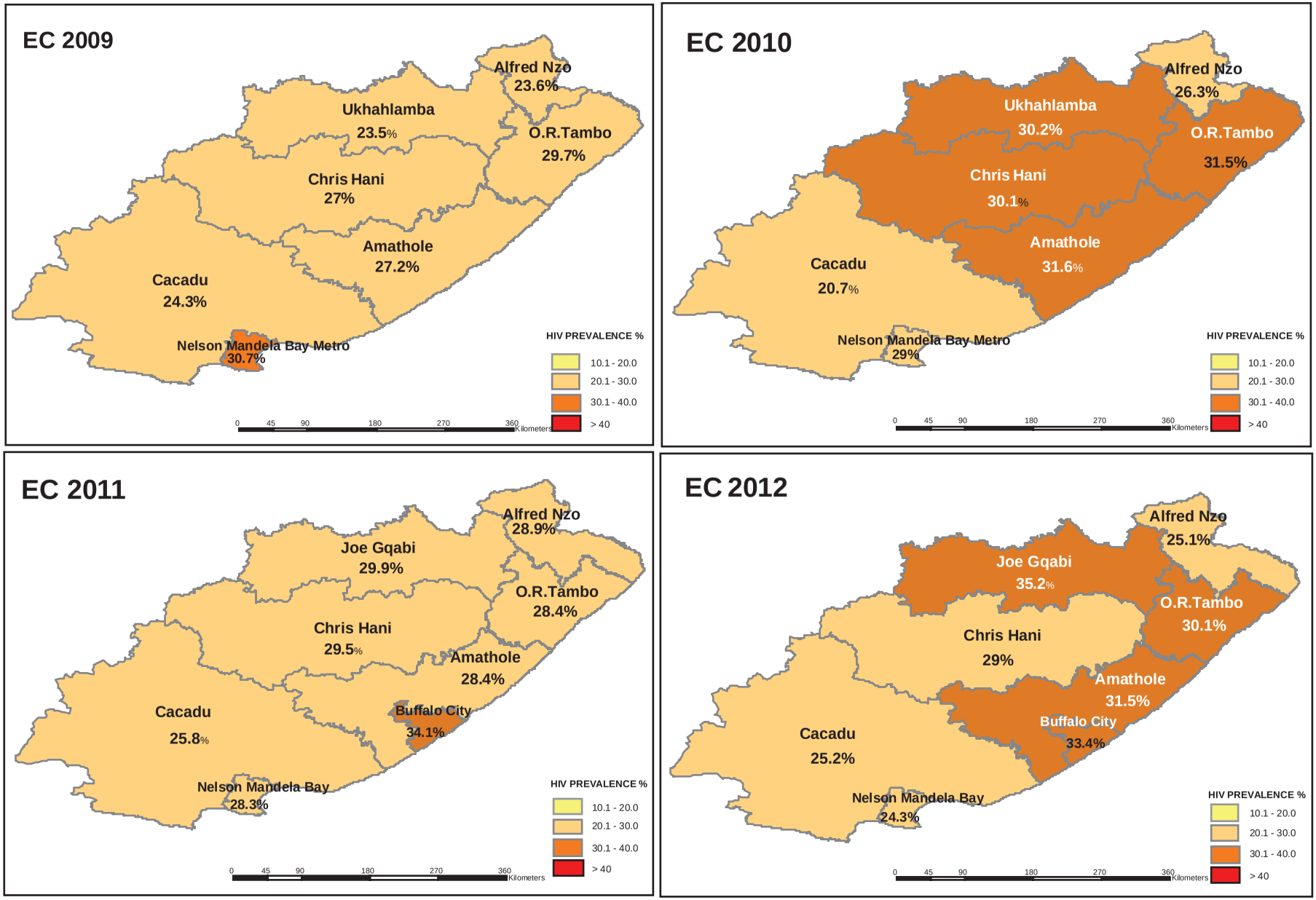



**Figure 16:** HIV prevalence distribution among survey participants by district in the Eastern Cape, 2009 – 2012. *(Source: NDoH, 2013)*

### 3.9.2 THE FREE STATE PROVINCE

In 2012, the Free State provincial HIV prevalence amongst antenatal women was 32.0% (95% CI: 29.8 – 34.3%). Figure 17 shows an increase of 1.4% from the 30.6% recorded in 2010.

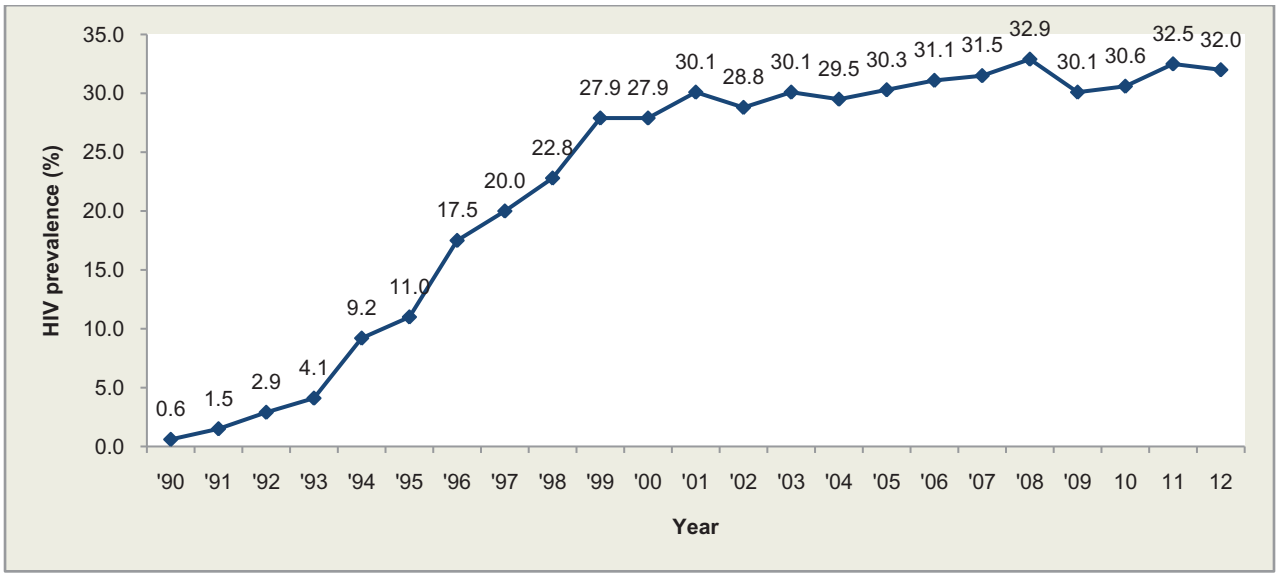
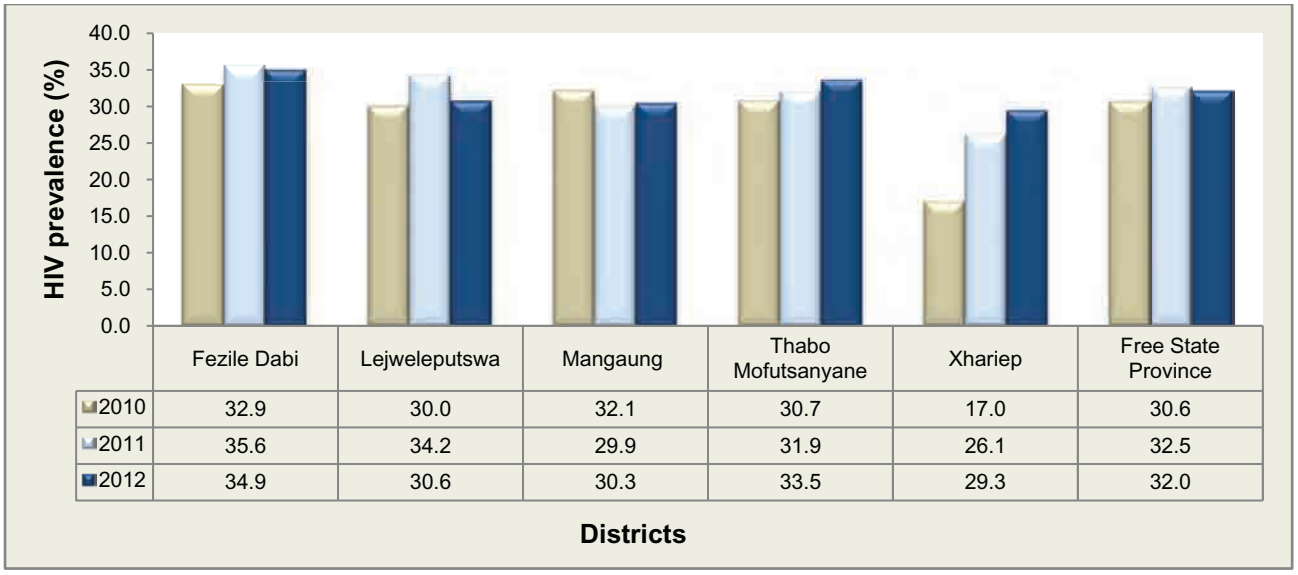



**Figure 17:** HIV epidemic curve among antenatal women, Free State, 1990 to 2012. (*Source*: NDoH, 2013)

The trends in district prevalence rates in this province from 2010 to 2012 are shown in Table 10 and Figure 18. In 2012, four of the five districts in the Free State recorded HIV prevalence above 30% compared to three districts in 2011. Xhariep recorded a slightly lower prevalence at 29.3 % which is itself an increase of 12% from 17.0% in 2010. Thabo Mofutsanyane has had increases in HIV prevalence from 30.7% in 2010, 31.9% in 2011 and 33.5% in 2012. Results in some districts are based on sample size less than 400, and therefore interpretation of the findings should be treated with caution.

**Table 10:** HIV prevalence among antenatal women by district, in the Free State, 2010 to 2012.

| Free State | 2010 | | | 2011 | | | 2012 | | |
|---|---|---|---|---|---|---|---|---|---|
| | N | % Prev. | 95% CI | N | % Prev. | 95% CI | N | % Prev. | 95% CI |
| **Provincial** | **2 223** | **30.6** | **28.3 – 33.0** | **2 292** | **32.5** | **30.5 – 34.5** | **2 325** | **32.0** | **29.8 – 34.3** |
| Fezile Dabi | 413 | 32.9 | 28.0 – 38.3 | 421 | 35.6 | 31.3 – 40.2 | 358 | 34.9 | 29.3 – 41.1 |
| Lejweleputswa | 601 | 30.0 | 26.1 – 34.2 | 626 | 34.2 | 30.4 – 38.2 | 585 | 30.6 | 26.8 - 34.7 |
| Mangaung Metro | 545 | 32.1 | 27.2 – 37.4 | 491 | 29.9 | 26.0 – 34.2 | 501 | 30.3 | 24.1 – 37.4 |
| Thabo Mofutsanyane | 558 | 30.7 | 26.0 – 35.8 | 620 | 31.9 | 28.0 – 36.1 | 701 | 33.5 | 30.1 - 37.1 |
| Xhariep | 106 | 17.0 | 10.4 – 26.5 | 134 | 26.1 | 17.9 – 36.5 | 164 | 29.3 | 22.8 - 36.7 |




| | Fezile Dabi | Lejweleputswa | Mangaung | Thabo Mofutsanyane | Xhariep | Free State Province |
|---|---|---|---|---|---|---|
| 2010 | 32.9 | 30.0 | 32.1 | 30.7 | 17.0 | 30.6 |
| 2011 | 35.6 | 34.2 | 29.9 | 31.9 | 26.1 | 32.5 |
| 2012 | 34.9 | 30.6 | 30.3 | 33.5 | 29.3 | 32.0 |

**Figure 18:** HIV prevalence trends among antenatal women, Free State, 2010 to 2012. (*Source*: NDoH, 2013)

Fourteen (14) of the pregnant women who participated in the 2012 survey in this province were under the age of 15 years. Women in this age categories are classified as high risk in pregnancy. The majority (30.7%) of the survey participants were women aged 20 – 24 years (Figure 19).

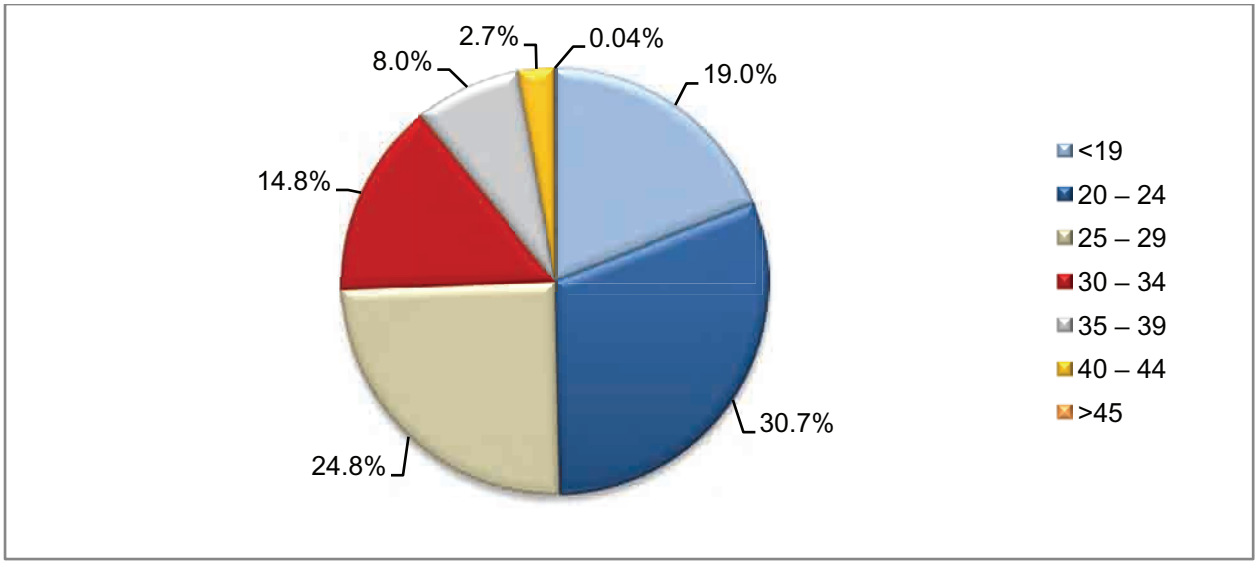



**Figure 19:** Sampled population distribution by age group, Free State, 2012. (*Source*: NDoH, 2013)

The HIV prevalence rates among the 15 - 24 year olds (which is the Millennium Development Goal 6, Target 7 indicator 18) in this province was 21.0% in 2010, 23.0% in 2011 and 21.2% in 2012. This group constituted well over half of the sampled population. In most other age groups HIV prevalence rates increased from 2010 to 2011 and then decreased in 2012 (Table 11).

**Table 11:** HIV prevalence among antenatal women by age group, Free State, 2010 to 2012.

| Age group (Years) | 2010 | | 2011 | | 2012 | |
|---|---|---|---|---|---|---|
| | N | % Prev. | N | % Prev. | N | % Prev. |
| >15 | 14 | 0.0 | 10 | 10.0 | 14 | 0.0 |
| 15 -19 | 443 | 14.0 | 424 | 17.0 | 428 | 14.3 |
| *15 - 24 | 1 118 | 21.0 | 1 172 | 23.0 | 1 140 | 21.2 |
| 20 – 24 | 675 | 25.6 | 748 | 26.5 | 712 | 25.4 |
| 25 – 29 | 554 | 36.8 | 546 | 38.1 | 575 | 40.4 |
| 30 – 34 | 324 | 46.9 | 331 | 48.3 | 344 | 45.1 |
| 35 – 39 | 172 | 44.2 | 195 | 45.6 | 186 | 47.9 |
| 40 – 44 | 38 | 34.2 | 45 | 37.8 | 63 | 33.3 |
| 45 – 49 | 3 | 0.0 | 3 | 0.0 | 1 | 0.0 |
| >49 | ** | ** | 1 | 0.0 | ** | ** |

The changes in HIV prevalence distribution in the Free State province from 2009 to 2012 are shown in Figure 20.

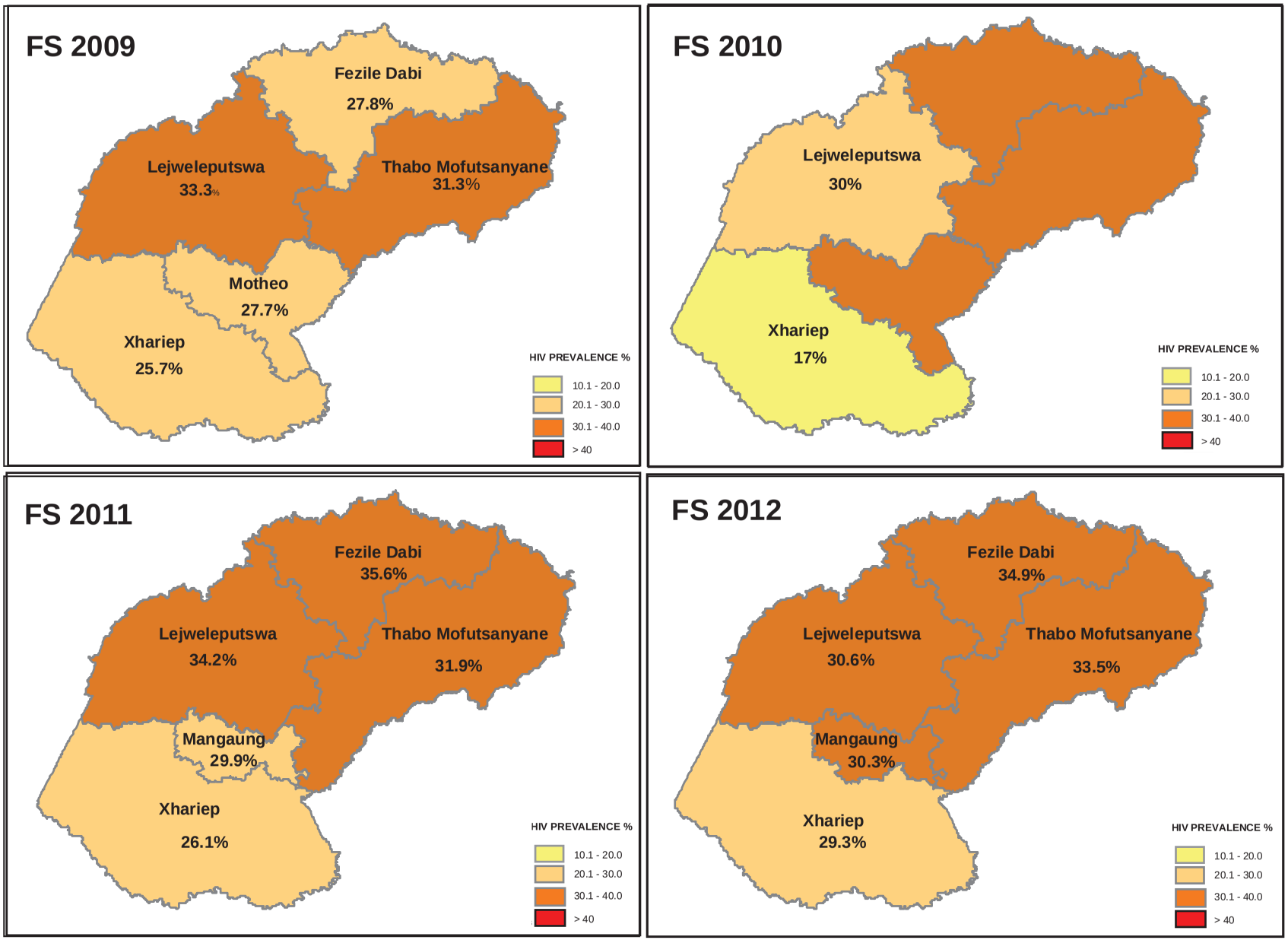



**Figure 20:** HIV prevalence distribution among survey participants in the by district in the Free State, 2009 – 2012. (*Source*: NDoH, 2013)

### 3.9.3 THE GAUTENG PROVINCE

In 2012, the Gauteng provincial HIV prevalence amongst antenatal women was 29.9% (95% CI: 28.3 – 31.5%). The overall prevalence in Gauteng shows a decreasing trend from a high of 33.1% recorded in 2004 (Figure 21).

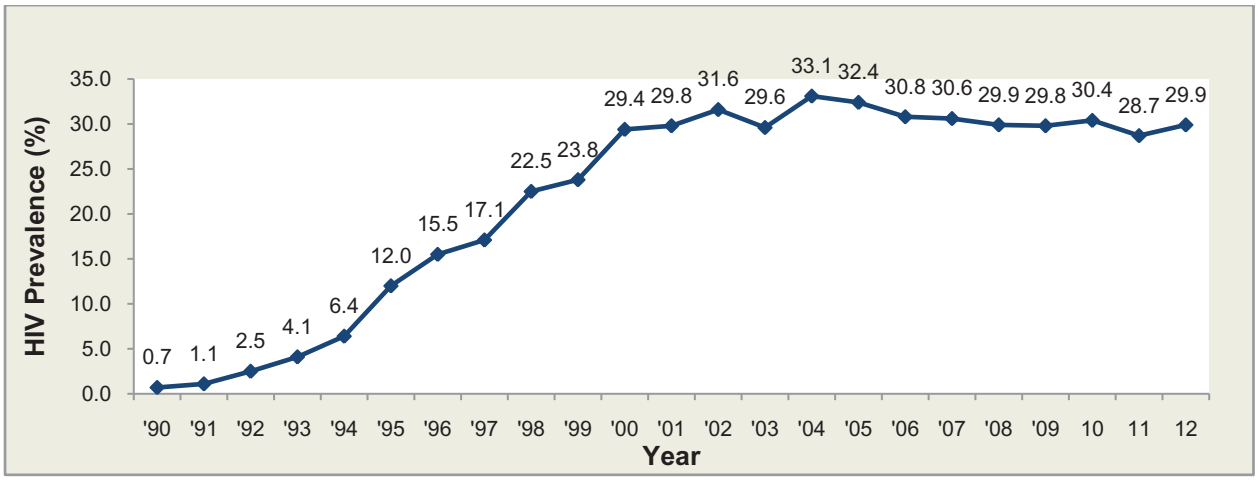
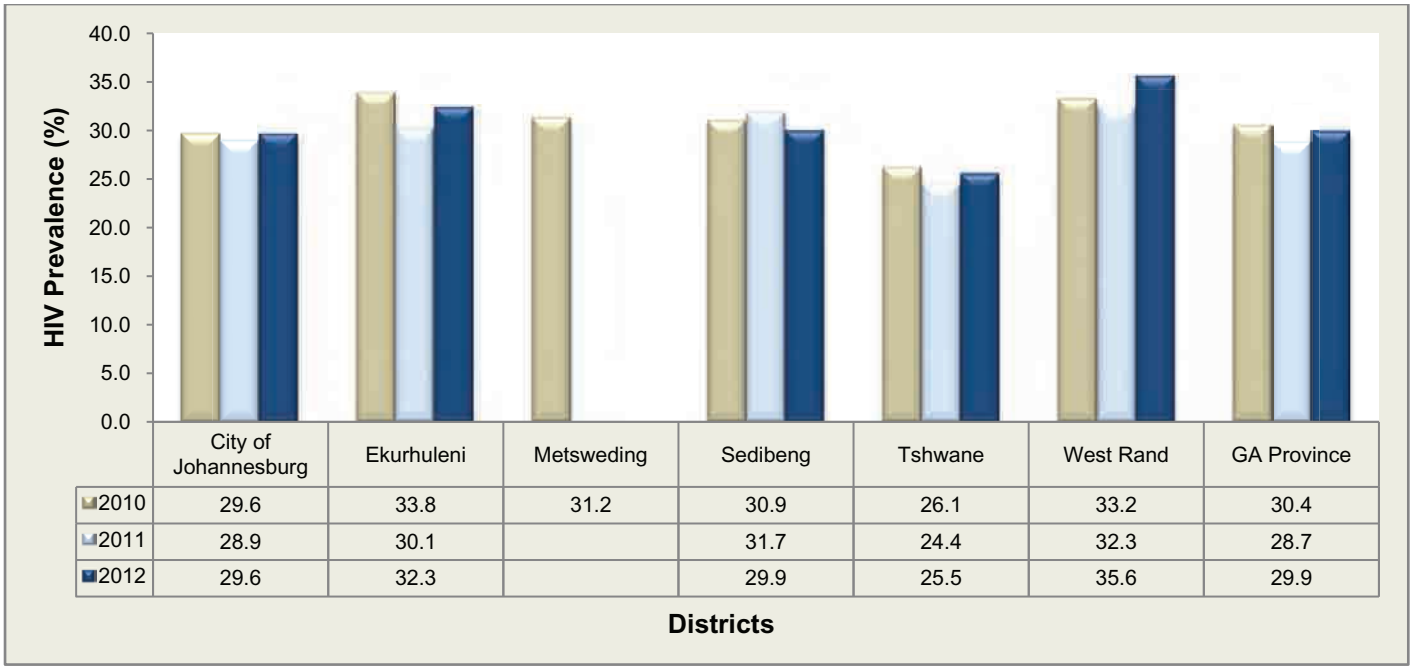



**Figure 21:** HIV epidemic curve among antenatal women, Gauteng, 1990 to 2012. (*Source*: NDoH, 2013)

It is seen from Table 12 and Figure 22, that the overall HIV prevalence in the major urban areas: City of Johannesburg, Ekurhuleni and Tshwane has largely remained stable from 2010 to 2012. In 2012, West Rand recorded the highest prevalence of 35.6%, followed by Ekurhuleni with a prevalence of 32.3%. West Rand and Ekurhuleni districts have shown an HIV prevalence increase of 3.3% and 2.1% respectively between 2011 and 2012.

**Table 12:** HIV prevalence among antenatal women by district in the Gauteng, 2010 to 2012.

| Gauteng | 2010 | | | 2011 | | | 2012 | | |
|---|---|---|---|---|---|---|---|---|---|
| | N | % Prev. | 95% CI | N | % Prev. | 95% CI | N | % Prev. | 95% CI |
| **Provincial** | **6 714** | **30.4** | **29.1 – 31.8** | **6 948** | **28.7** | **27.3 – 30.1** | **6 862** | **29.9** | **28.3 - 31.5** |
| City of JHB | 2 000 | 29.6 | 27.4 – 32.0 | 2 228 | 28.9 | 26.6 – 31.3 | 2 273 | 29.6 | 27.5 - 31.9 |
| Ekurhuleni | 1 959 | 33.8 | 31.7 – 35.9 | 1 829 | 30.1 | 27.6 – 32.8 | 1 758 | 32.3 | 29.0 – 35.8 |
| Metsweding | 125 | 31.2 | 26.2 – 36.7 | Metsweding district is now part of Tshwane since 2011 | | | | | |
| Sedibeng | 499 | 30.9 | 26.5 – 35.6 | 660 | 31.7 | 29.0 – 34.5 | 588 | 29.9 | 24.1 – 36.5 |
| Tshwane | 1 583 | 26.1 | 22.9 – 29.6 | 1 637 | 24.4 | 21.2 – 27.9 | 1 571 | 25.5 | 22.2 - 29.1 |
| West Rand | 584 | 33.2 | 29.7 – 37.0 | 594 | 32.3 | 28.5 – 36.4 | 565 | 35.6 | 30.6 – 40.9 |




| | City of Johannesburg | Ekurhuleni | Metsweding | Sedibeng | Tshwane | West Rand | GA Province |
|---|---|---|---|---|---|---|---|
| 2010 | 29.6 | 33.8 | 31.2 | 30.9 | 26.1 | 33.2 | 30.4 |
| 2011 | 28.9 | 30.1 | | 31.7 | 24.4 | 32.3 | 28.7 |
| 2012 | 29.6 | 32.3 | | 29.9 | 25.5 | 35.6 | 29.9 |

**Figure 22:** HIV prevalence trends among antenatal women, Gauteng, 2010 to 2012. (*Source*: NDoH, 2013)

The age distribution of pregnant women who participated in the 2012 survey in Gauteng is shown in Figure 23. Nineteen percent (19%) of the survey participants in this province were under the age of 19 years. As in other provinces, the majority of the survey participants were young women (20 - 24 years). Sixteen (16) of the women who participated in the survey were less than 15 years of age.

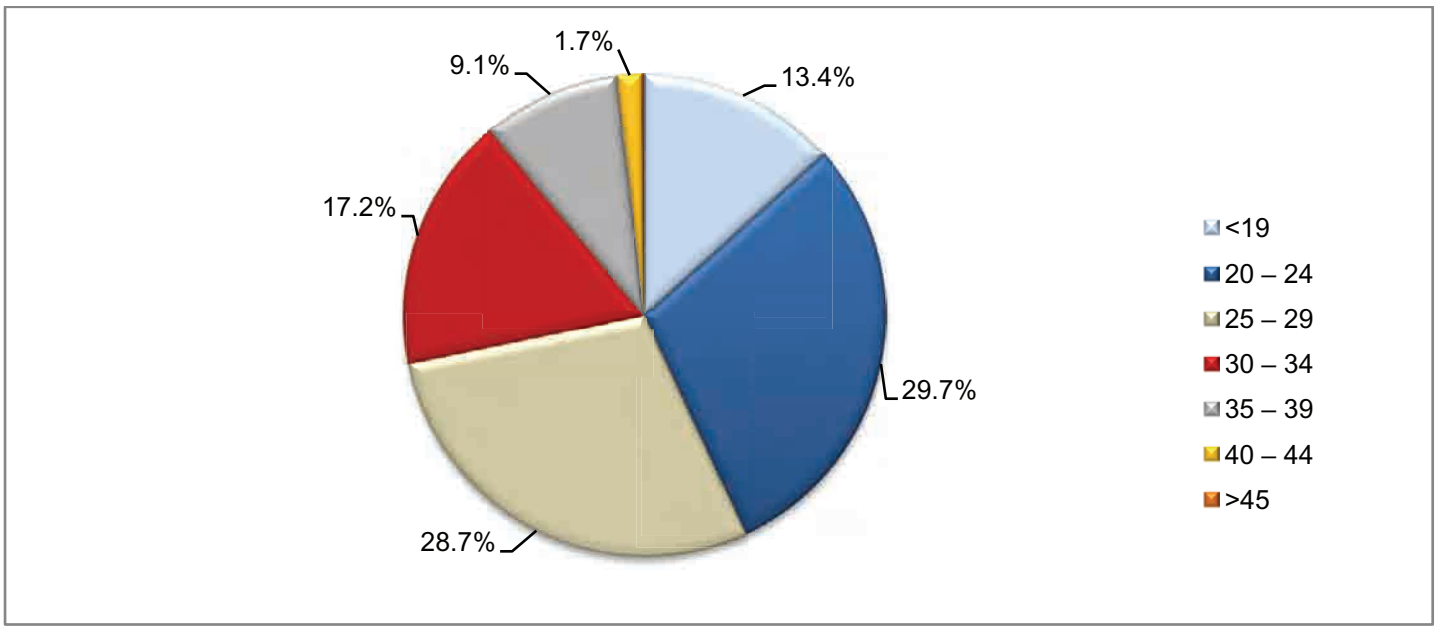



**Figure 23:** Sampled population distribution by age group, Gauteng, 2012.

In 2012 the 15 - 24 year old pregnant women's HIV prevalence was 19.6% compared with 20.8% in 2010 and 18.7% in 2011 which indicates stability in the prevalence in this group in the past three years. This MDG 6 group constituted almost 50% (N = 2 901) of the survey population in the province. The HIV prevalence among women in the age groups 30 – 34 and 35 - 39 years, remains high, at 40.5% and 42.2% in 2010 and 41.4% and 43.3% in 2012 (Table 13).

**Table 13:** HIV prevalence among antenatal women by age group, Gauteng, 2010 to 2012.

| Age group (Years) | 2010 | | 2011 | | 2012 | |
|---|---|---|---|---|---|---|
| | N | % Prev. | N | % Prev. | N | % Prev. |
| <15 | 12 | 8.3 | 9 | 11.1 | 16 | 0.0 |
| 15 -19 | 887 | 12.6 | 956 | 12.0 | 888 | 12.7 |
| *15 - 24 | 2 927 | 20.8 | 3 049 | 18.7 | 2 901 | 19.6 |
| 20 – 24 | 2 040 | 24.4 | 2 093 | 21.7 | 2 013 | 22.7 |
| 25 – 29 | 1 928 | 36.3 | 1 961 | 33.5 | 1 945 | 33.7 |
| 30 – 34 | 1 068 | 40.5 | 1 144 | 42.2 | 1 163 | 41.4 |
| 35 – 39 | 545 | 42.2 | 609 | 38.4 | 619 | 43.3 |
| 40 – 44 | 138 | 31.2 | 164 | 26.8 | 117 | 37.6 |
| 45 – 49 | 8 | 25.0 | 21 | 33.3 | 10 | 20.0 |
| >49 | ** | ** | 3 | 33.3 | ** | ** |

The changes in HIV prevalence distribution in Gauteng province from 2009 to 2012 are shown in Figure 24.

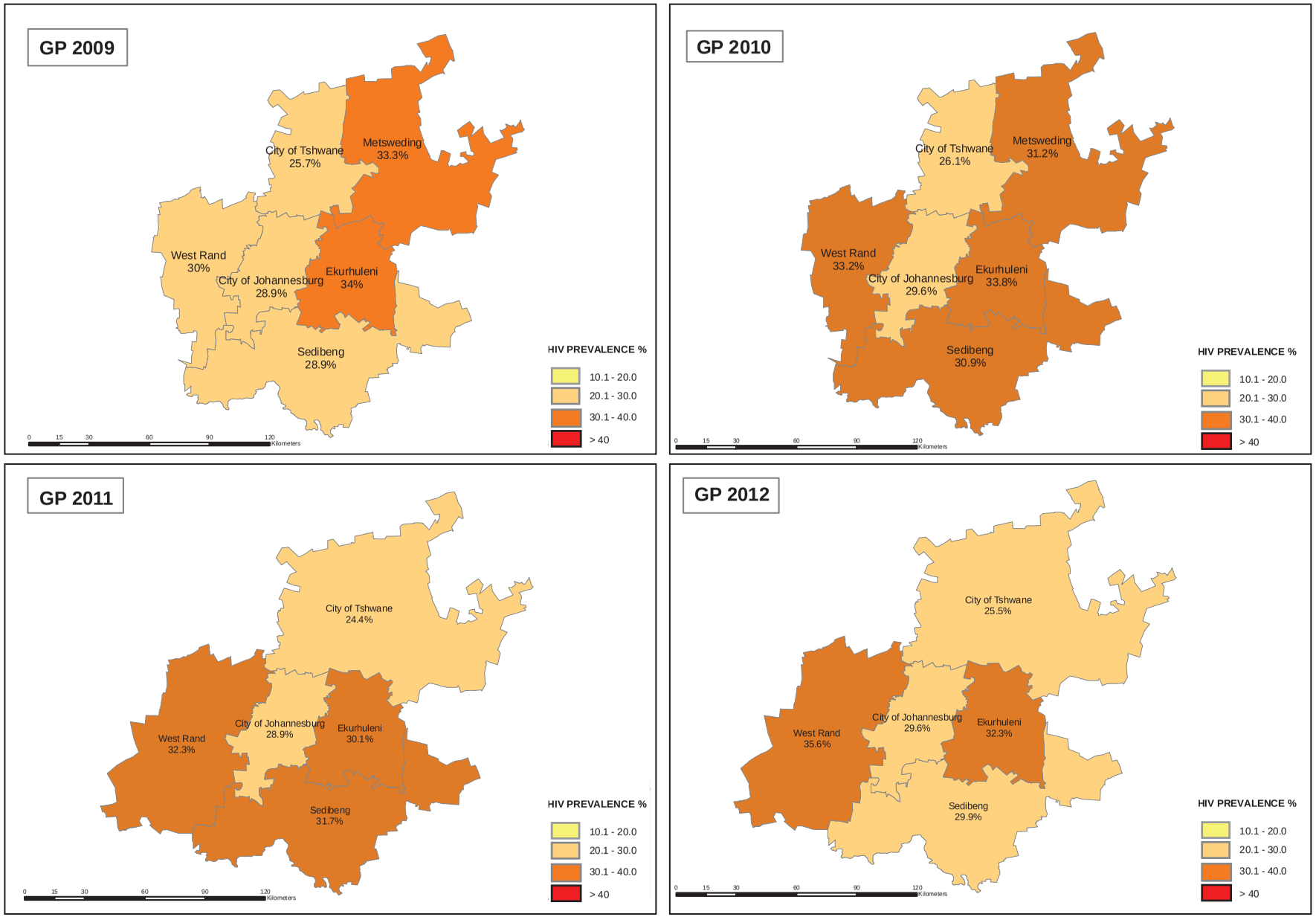



**Figure 24:** HIV prevalence distribution among survey participants by district in Gauteng, 2009 - 2012. (*Source*: NDoH, 2013)

### 3.9.4 THE KWAZULU-NATALPROVINCE

The HIV prevalence amongst antenatal women in KwaZulu-Natal remains the highest in the country at 37.4% (95%CI: 36.0 – 38.7%). The prevalence in the province has stabilized at 37.4% but has decreased from a peak of 40.7% in 2004 (Figure 25).

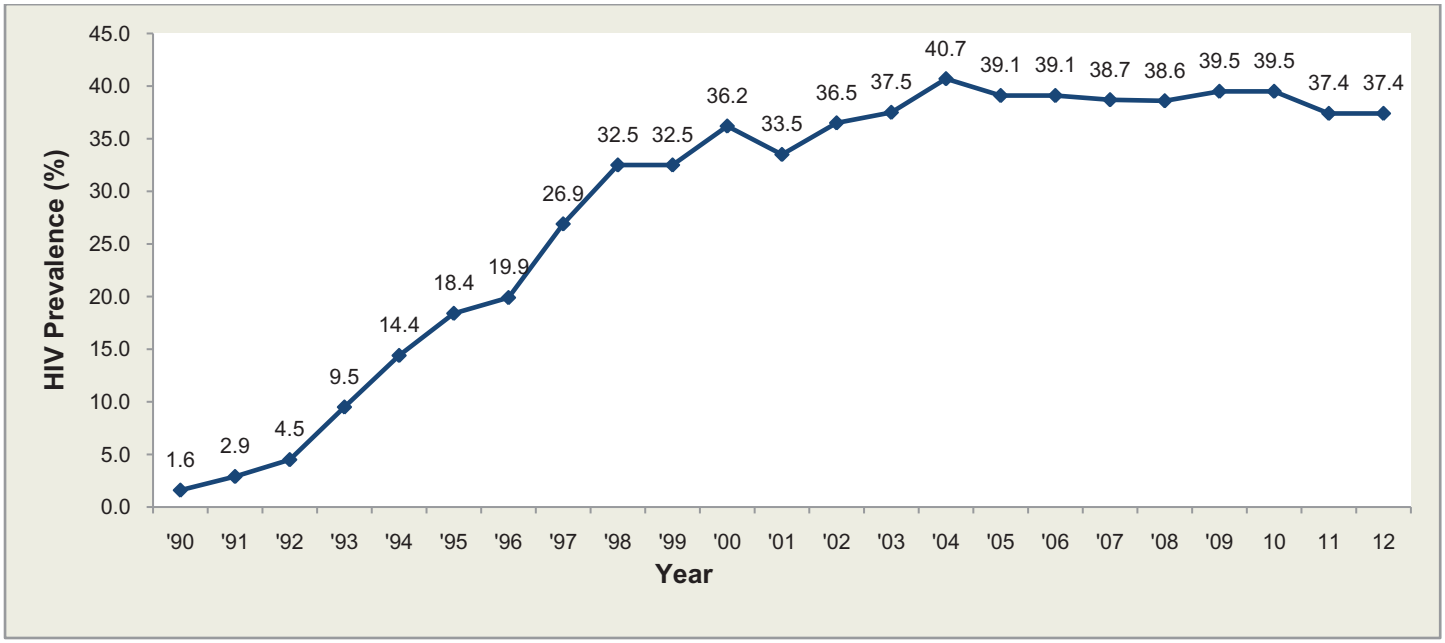
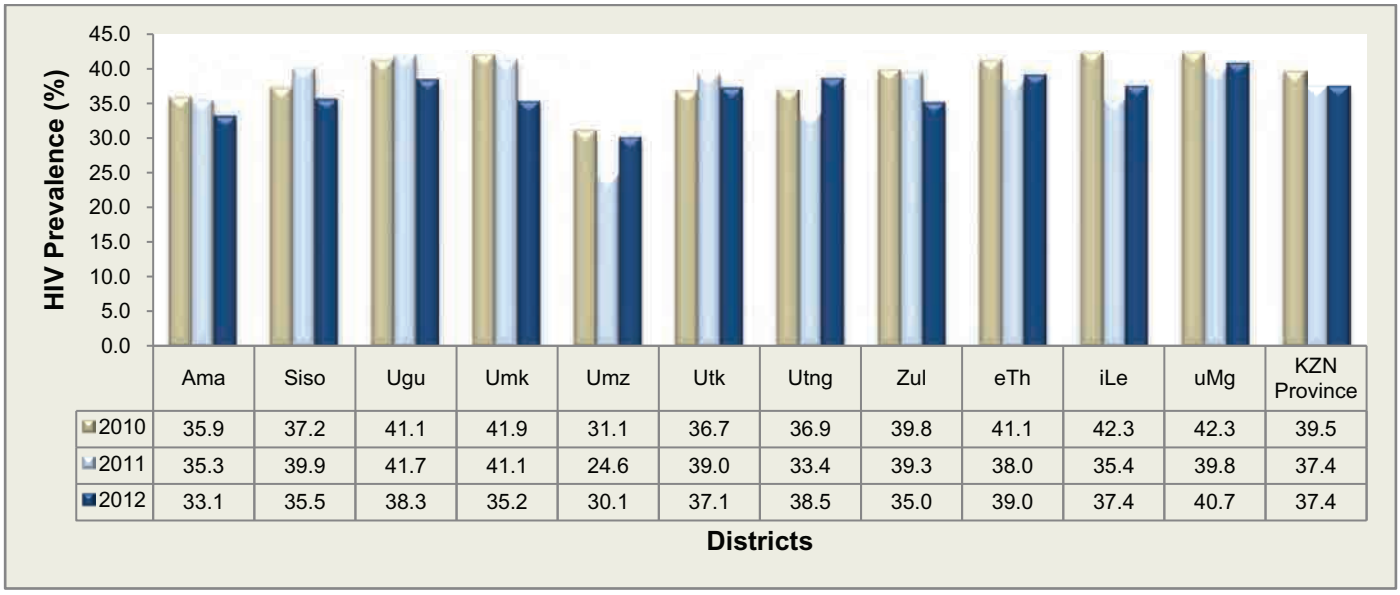



**Figure 25:** HIV epidemic curve among antenatal women, KwaZulu-Natal, 1990 to 2012. (*Source*: NDoH, 2013)

The trends in district HIV prevalence rates in this province from 2010 to 2012 are shown in Table 14 and Figure 26. Three districts: Sisonke, uMkhanyakude and Zululand, have consistently been recording decreasing prevalence rates from 2010 to 2012. uMzinyathi still has the lowest HIV prevalence, but has increased from 24.6% in 2011 to 30.1% in 2012. In 2012, only one district uMgungundlovu, recorded HIV prevalence over 40% as opposed to the 2010 survey where 5 districts recorded prevalence rates over 40% (iLembe and uMgungundlovu (42.3% each), eThekwini and Ugu (41.1% each) and uMkhanyakude (41.9%).

**Table 14:** HIV prevalence among antenatal women by district, in KwaZulu-Natal, 2010 to 2012.

| KwaZulu-Natal | 2010 | | | 2011 | | | 2012 | | |
|---|---|---|---|---|---|---|---|---|---|
| | N | % Prev. | 95% CI | N | % Prev. | 95% CI | N | % Prev. | 95% CI |
| **Province** | **6 887** | **39.5** | **38.0 – 41.0** | **6 714** | **37.4** | **35-8 -39.0** | **7 011** | **37.4** | **36.0 - 38.7** |
| Amajuba | 407 | 35.9 | 30.5 – 41.6 | 408 | 35.3 | 31.6 – 39.2 | 417 | 33.1 | 28.5 –38.0 |
| Sisonke | 325 | 37.2 | 31.6 – 43.2 | 323 | 39.9 | 29.5 – 42.9 | 338 | 35.5 | 30.0–41.5 |
| Ugu | 453 | 41.1 | 35.5 – 46.9 | 472 | 41.7 | 35.0 – 48.8 | 488 | 38.3 | 33.2–43.7 |
| uMkhanyakude | 389 | 41.9 | 35.6 – 48.5 | 414 | 41.1 | 35.6 – 46.8 | 412 | 35.2 | 29.4 –41.5 |
| uMzinyathi | 334 | 31.1 | 24.9 – 38.1 | 305 | 24.6 | 20.4 – 29.4 | 339 | 30.1 | 25.9–34.6 |
| uThukela | 450 | 36.7 | 30.6 – 43.2 | 403 | 39.0 | 33.6 – 44.6 | 447 | 37.1 | 30.6 - 44.2 |
| uThungulu | 712 | 36.9 | 32.8 – 41.3 | 584 | 33.4 | 29.0 – 38.1 | 611 | 38.5 | 33.6 - 43.6 |
| Zululand | 583 | 39.8 | 34.2 – 45.6 | 595 | 39.3 | 33.8 – 45.2 | 578 | 35.0 | 29.4–41.0 |
| eThekwini | 2 144 | 41.1 | 38.3 – 43.9 | 2 147 | 38.0 | 35.1 – 41.0 | 2 222 | 39.0 | 36.7– 41.4 |
| ILembe | 416 | 42.3 | 37.5 – 47.3 | 418 | 35.4 | 26.7 – 45.2 | 433 | 37.4 | 33.0 - 42.0 |
| uMgungundlovu | 674 | 42.3 | 39.0 – 45.7 | 645 | 39.8 | 35.6 – 44.3 | 705 | 40.7 | 37.6–43.9 |




| | Ama | Siso | Ugu | Umk | Umz | Utk | Utng | Zul | eTh | iLe | uMg | KZN Province |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2010 | 35.9 | 37.2 | 41.1 | 41.9 | 31.1 | 36.7 | 36.9 | 39.8 | 41.1 | 42.3 | 42.3 | 39.5 |
| 2011 | 35.3 | 39.9 | 41.7 | 41.1 | 24.6 | 39.0 | 33.4 | 39.3 | 38.0 | 35.4 | 39.8 | 37.4 |
| 2012 | 33.1 | 35.5 | 38.3 | 35.2 | 30.1 | 37.1 | 38.5 | 35.0 | 39.0 | 37.4 | 40.7 | 37.4 |

**Figure 26:** HIV prevalence trends among antenatal women, KwaZulu-Natal, 2010 to 2012. (*Source*: NDoH, 2013)

Ama = Amajuba; Siso =: Sisonke; Um=: uMkhanyakude; Umz =uMzinyathi; Utng =uThungulu; Utk= uThukela; Zul =Zululand; eTh: =eThekwini; iLe=iLembe; uMg = uMgungundlovu.

A total of 1 793 (25.6%) of the women who participated in the 2012 survey in KwaZulu-Natal, were under the age of 19 years. The majority of the survey participants were young adults, 20- 24 years, (N = 2 115) (Figure 27). Twenty (20) of the women who participated in the survey were less than 15 years of age.

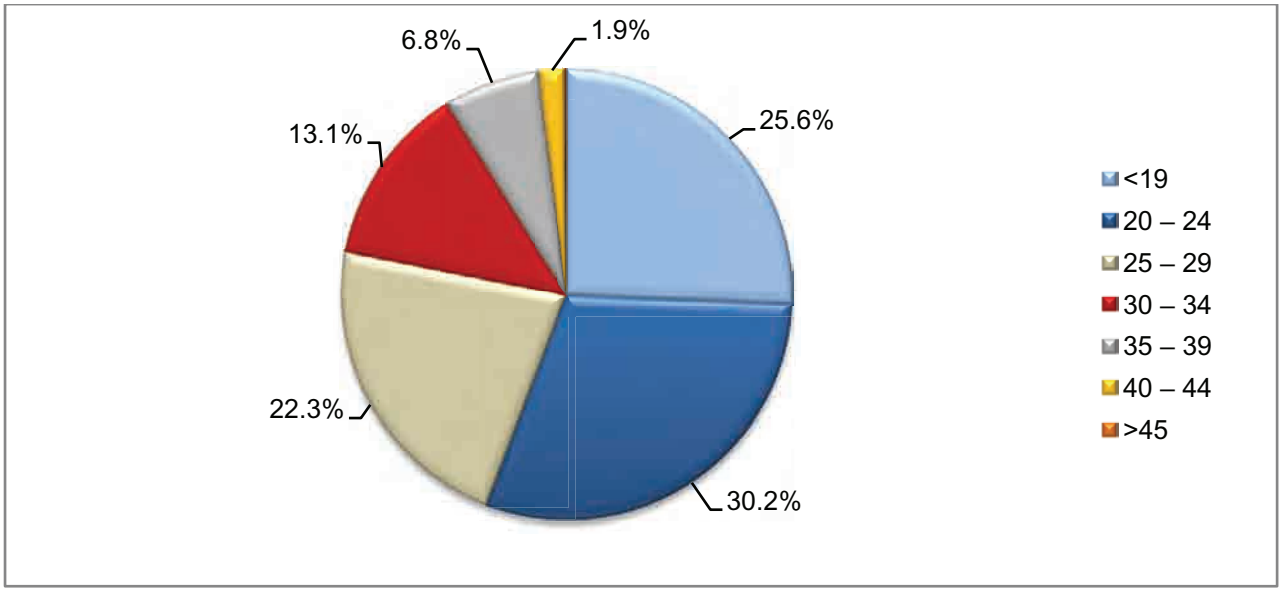



**Figure 27:** Sampled population distribution by age group, KwaZulu-Natal, 2012.

The HIV prevalence among the 15 - 24 year olds (which is the Millennium Development Goal 6, Target 7 indicator 18 group) decreased from 29.2% in 2010 to 25.8% in 2012. A slight decrease in HIV prevalence was also noted among teenagers in the age group 15 - 19 years from 16.8% in 2011 to 16.6% in 2012. HIV prevalence trends in the older age groups (above 24 years) remain high (Table 15) with the highest HIV prevalence of 59.0% recorded in the age group 30 – 34 years.

**Table 15:** HIV prevalence among antenatal women by age group, KZN, 2010 to 2012.

| Age group (Years) | 2010 | | 2011 | | 2012 | |
|---|---|---|---|---|---|---|
| | N | % Prev. | N | % Prev. | N | % Prev. |
| 10-14 | 26 | 19.2 | 24 | 12.5 | 20 | 0.0 |
| 15 -19 | 1 570 | 20.5 | 1 555 | 16.8 | 1 773 | 16.6 |
| *15 - 24 | 3 849 | 29.2 | 3 738 | 25.5 | 3 888 | 25.8 |
| 20 – 24 | 2 275 | 35.2 | 2 183 | 33.3 | 2 115 | 33.6 |
| 25 – 29 | 1 583 | 50.9 | 1 541 | 50.0 | 1 565 | 48.1 |
| 30 – 34 | 862 | 57.8 | 838 | 53.1 | 919 | 59.0 |
| 35 – 39 | 433 | 52.7 | 455 | 53.1 | 478 | 51.1 |
| 40 – 44 | 114 | 46.5 | 125 | 43.2 | 132 | 48.5 |
| 45 – 49 | 13 | 38.5 | 17 | 52.9 | 8 | 37.5 |
| >49 | 4 | 50.0 | 3 | 100 | ** | ** |

The variation in HIV prevalence distribution in KwaZulu-Natal from 2009 to 2012 is shown in Figure 28.

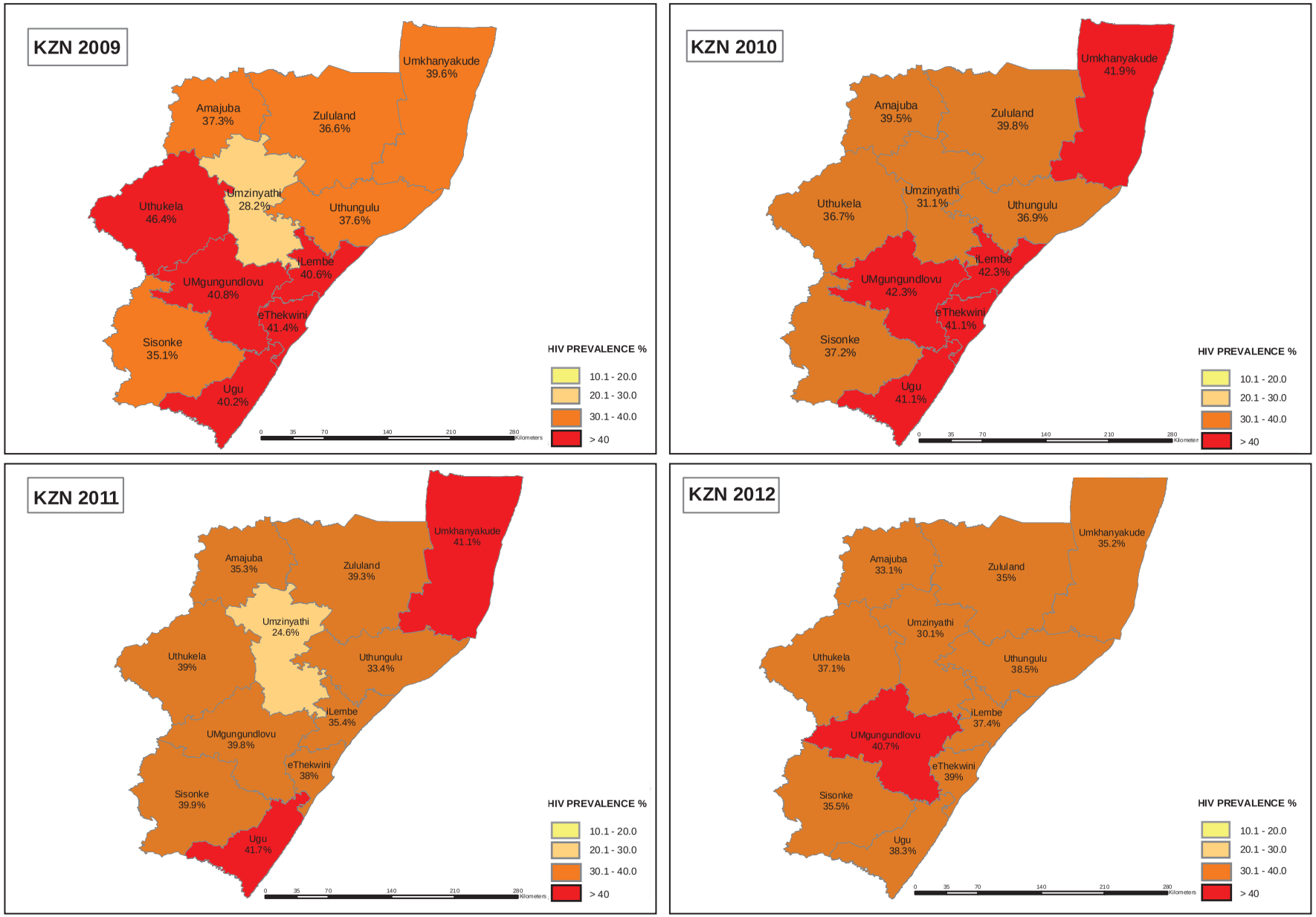



**Figure 28:** HIV prevalence distribution among survey participants by district in KwaZulu-Natal, 2009 - 2012. (*Source*: NDoH, 2013)

### 3.9.5 THE LIMPOPO PROVINCE

In 2012, the Limpopo provincial HIV prevalence amongst antenatal women in 2012 was estimated at 22.3% (95%CI: 20.7 – 23.9%). The overall provincial HIV prevalence in Limpopo has increased slightly from 21.9% in 2010 to 22.1% in 2011 and 22.3% in 2012 (Figure 29).

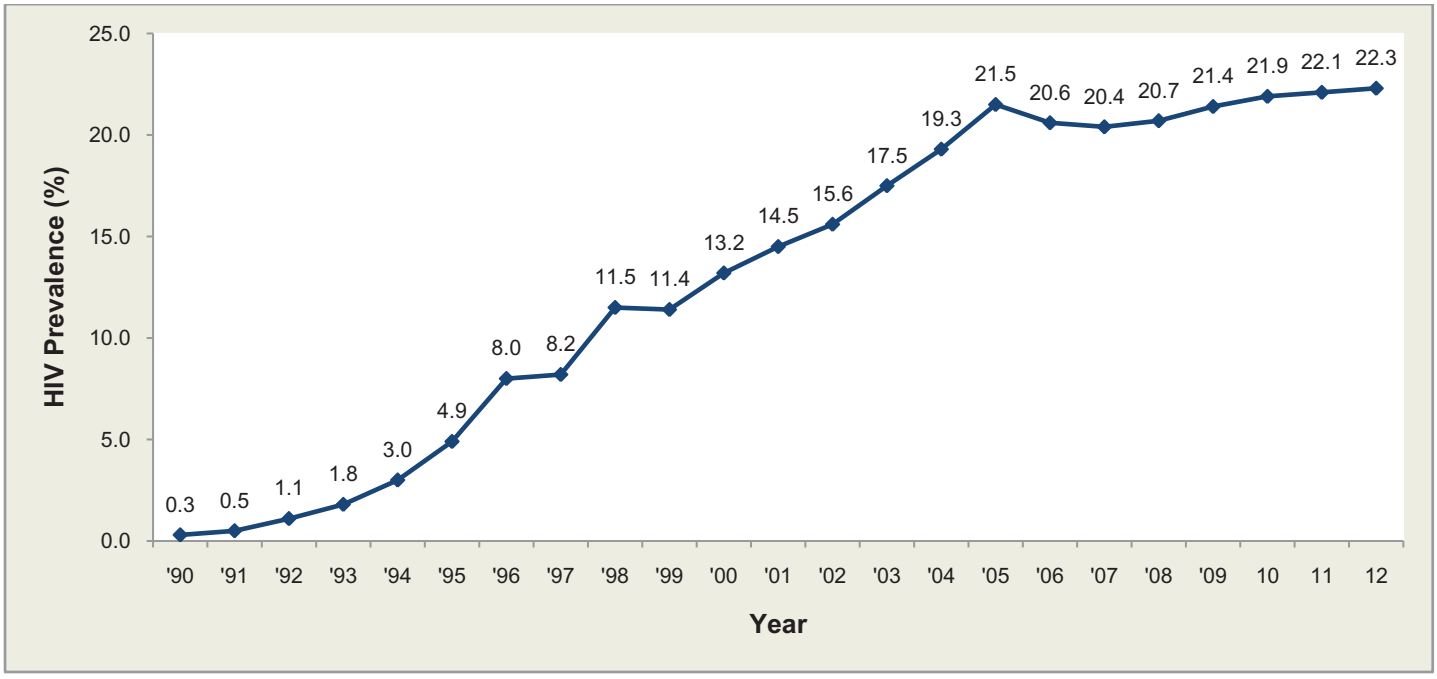
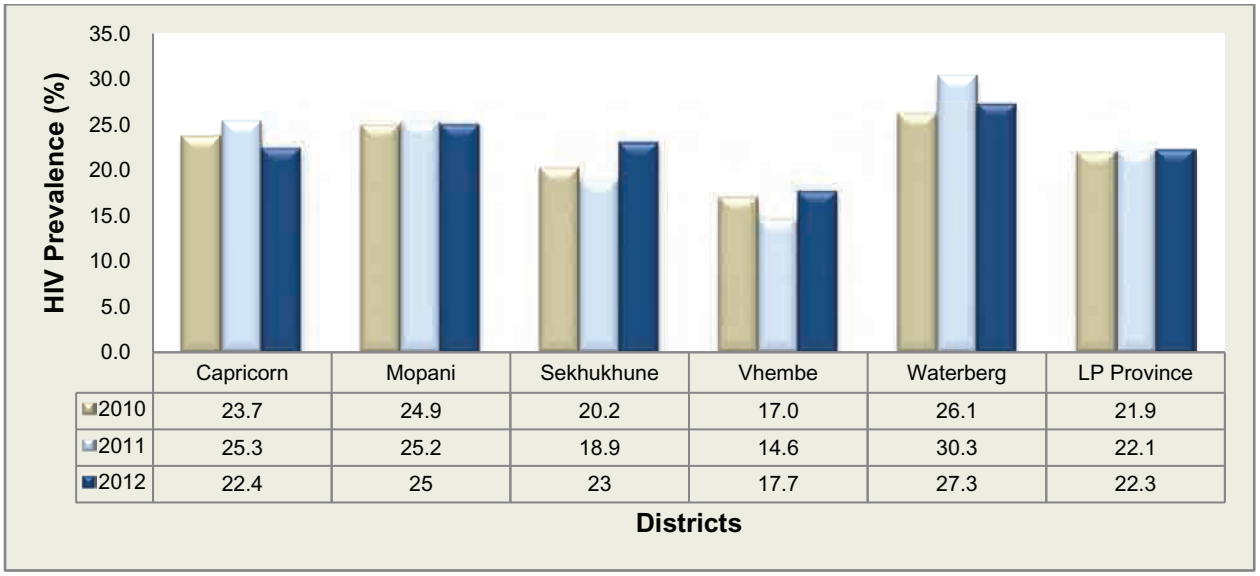



**Figure 29:** HIV epidemic curve among antenatal women, Limpopo, 1990 to 2012. (*Source*: NDoH, 2013)

The trends in districts HIV prevalence rates in this province are shown in Table 16 and Figure 30. Erratic changes in HIV prevalence rates were seen in Vhembe district, which has consistently recorded the lowest HIV prevalence, from 17.0% in 2010 to 14.6% in 2011 and 17.7% in 2012. Sekhukhune had a similar trend from 20.2% in 2010 to 18.9% in 2011 and 23.0% in 2012. This could be attributed to small and variable sample sizes. Waterberg district continues to record the highest HIV prevalence in this province, although a notable decrease of 3% from 30.3% in 2011 to 27.3 % was noted this year.

**Table 16:** HIV prevalence among antenatal women by district, Limpopo, 2010 to 2012.

| Limpopo | 2010 | | | 2011 | | | 2012 | | |
|---|---|---|---|---|---|---|---|---|---|
| | N | % Prev. | 95% CI | N | % Prev. | 95% CI | N | % Prev. | 95% CI |
| **Provincial** | **3 117** | **21.9** | **20.3 – 23.6** | **3 651** | **22.1** | **20.6 – 23.7** | **3 579** | **22.3** | **20.7 - 23.9** |
| Capricorn | 786 | 23.7 | 20.3 – 27.5 | 896 | 25.3 | 22.5 – 28.5 | 800 | 22.4 | 19.1 – 26.1 |
| Mopani | 555 | 24.9 | 21.9 – 28.1 | 710 | 25.2 | 21.6 – 29.2 | 608 | 25.0 | 21.4 – 29.0 |
| Sekhukhune | 589 | 20.2 | 16.8 – 24.1 | 777 | 18.9 | 15.5 – 22.9 | 753 | 23.0 | 19.6 - 26.7 |
| Vhembe | 765 | 17.0 | 14.3 – 20.1 | 823 | 14.6 | 12.0 – 17.6 | 971 | 17.7 | 15.4 - 20.3 |
| Waterberg | 422 | 26.1 | 22.8 – 29.7 | 445 | 30.3 | 26.8 – 34.2 | 421 | 27.3 | 22.6 – 32.6 |




| | Capricorn | Mopani | Sekhukhune | Vhembe | Waterberg | LP Province |
|---|---|---|---|---|---|---|
| 2010 | 23.7 | 24.9 | 20.2 | 17.0 | 26.1 | 21.9 |
| 2011 | 25.3 | 25.2 | 18.9 | 14.6 | 30.3 | 22.1 |
| 2012 | 22.4 | 25 | 23 | 17.7 | 27.3 | 22.3 |

**Figure 30:** HIV prevalence trends among antenatal women, Limpopo, 2010 to 2012. (*Source*: NDoH, 2013)

The age distribution of pregnant women who participated in the 2012 survey ranged from twelve (12) under 15 year olds to fourteen (14) over 45 year olds (Figure 29). The majority of the survey participants were young women, 20 -24 years, (N = 1 009).

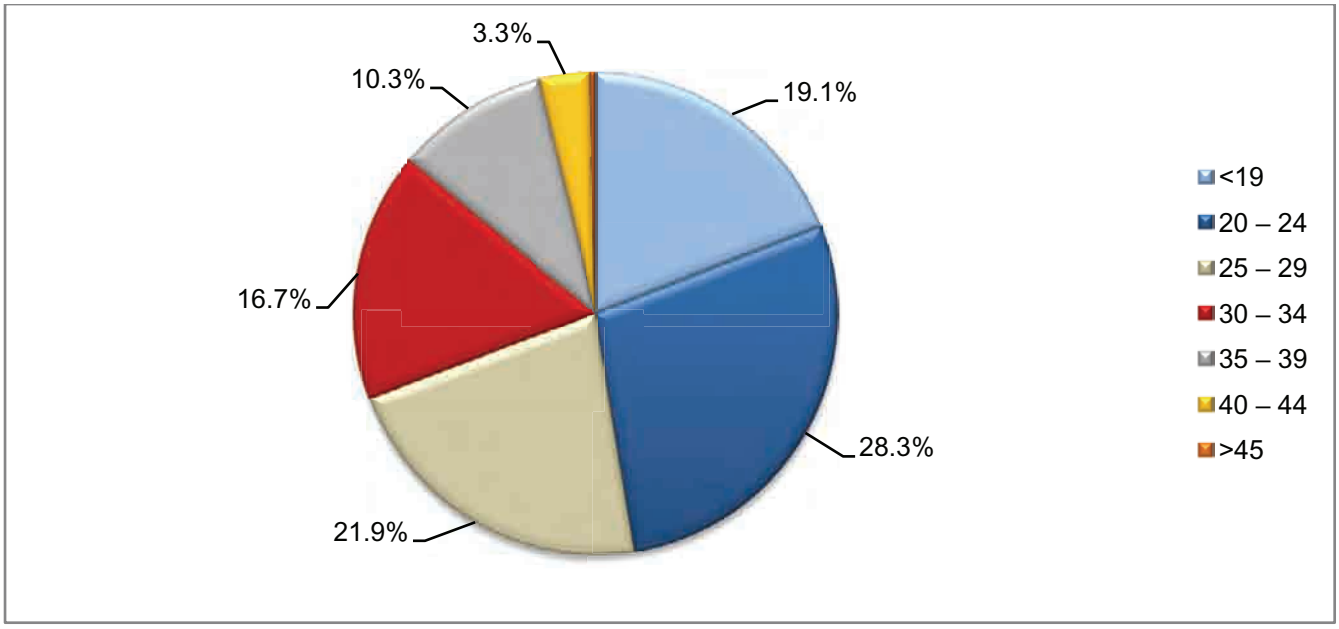



**Figure 31:** Sampled population distribution by age group, Limpopo, 2012.

The HIV prevalence among the 15 - 24 year old pregnant women has been decreasing steadily over the past three year, from 14.2% in 2010 to 13.6% in 2011 and 12.3% in 2012. The HIV prevalence of 34.0% was seen among women in the age groups 30 – 34 years.

**Table 17:** HIV prevalence among antenatal women by age group, Limpopo, 2010 to 2012.

| Age group (Years) | 2010 | | 2011 | | 2012 | |
|---|---|---|---|---|---|---|
| | N | % Prev. | N | % Prev. | N | % Prev. |
| <15 | 13 | 7.7 | 14 | 7.1 | 12 | 8.3 |
| 15 -19 | 618 | 7.1 | 675 | 7.4 | 669 | 7.3 |
| *15 - 24 | 1 520 | 14.2 | 1 753 | 13.6 | 1 678 | 12.3 |
| 20 – 24 | 902 | 19.1 | 1 078 | 17.5 | 1 009 | 15.6 |
| 25 – 29 | 726 | 28.7 | 877 | 27.4 | 780 | 29.9 |
| 30 – 34 | 452 | 31.9 | 571 | 33.5 | 595 | 34.0 |
| 35 – 39 | 245 | 29.4 | 335 | 33.7 | 367 | 30.8 |
| 40 – 44 | 100 | 24.0 | 96 | 22.9 | 119 | 26.1 |
| 45 – 49 | 4 | 25.0 | 19 | 15.8 | 14 | 42.9 |
| >49 | 1 | 100 | ** | ** | ** | ** |

The variation in HIV prevalence distribution in Limpopo from 2009 to 2012 is shown in Figure 32.

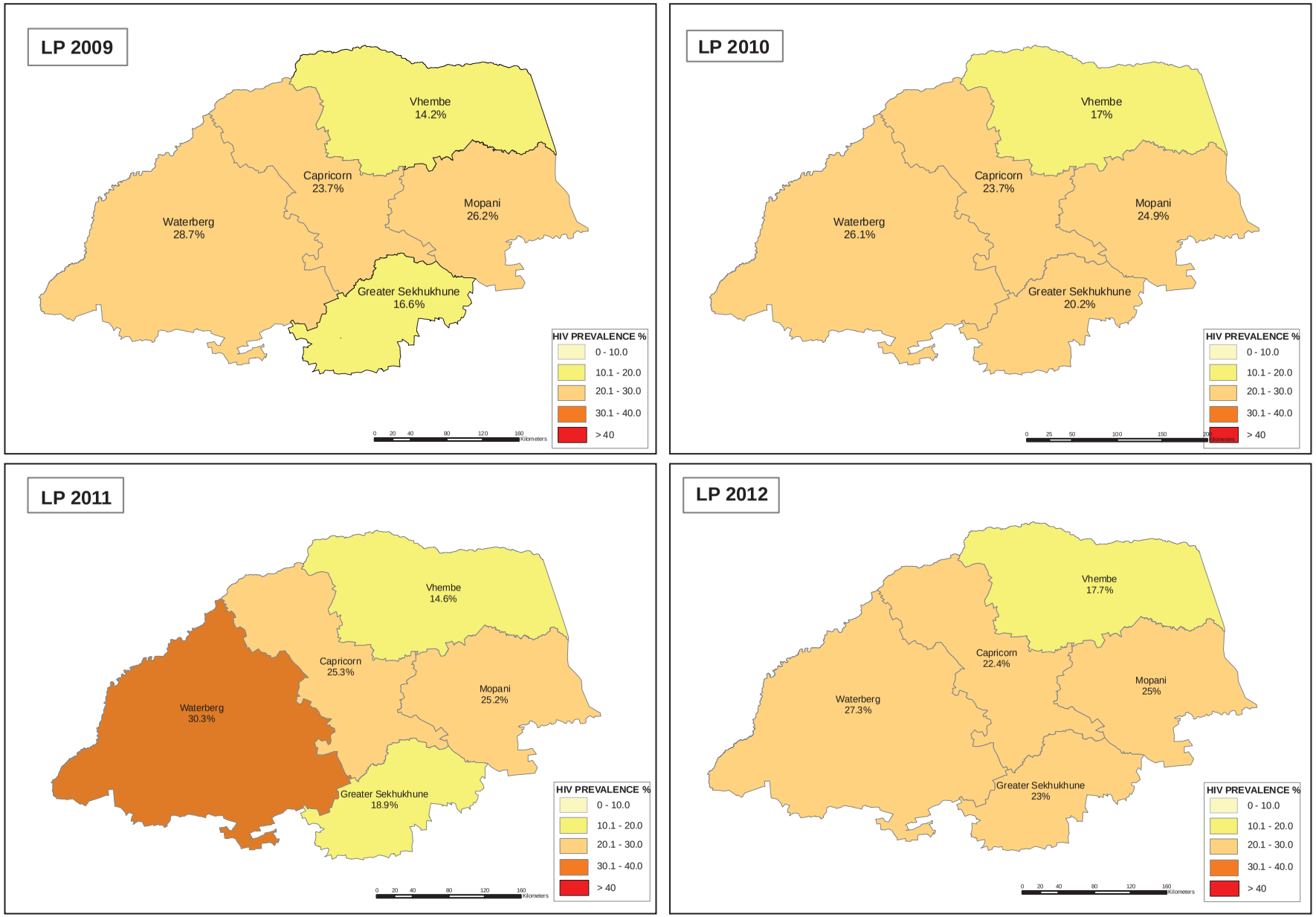



**Figure 32**: HIV prevalence distribution among survey participants by district in Limpopo, 2009 – 2012.(*Source*: NDoH, 2013)

### 3.9.6 THE MPUMALANGA PROVINCE

In 2012, the Mpumalanga provincial HIV prevalence amongst antenatal women was 35.6% (95%CI: 33.3 - 37.9%). This is a decrease of 1.1% from 36.7% in 2011. However, the prevalence has always been very high, above 30% since 2003 as shown in Figure 33.

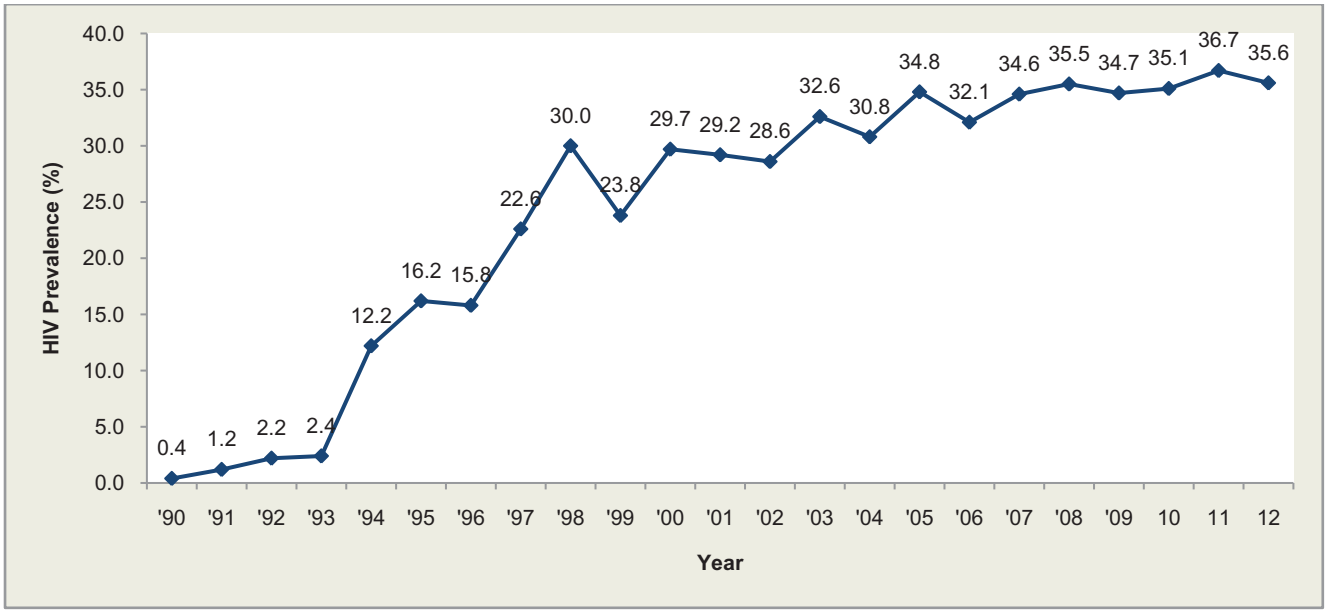



**Figure 33:** HIV epidemic curve among antenatal women, Mpumalanga 1990 to 2012. (*Source*: NDoH, 2013)

The district level variations in the HIV prevalence over the past three years are depicted in Table 18 and Figure 34. Two districts in the Mpumalanga province: Gert Sibande and Ehlanzeni recorded the 2nd and 12th highest HIV prevalence among the 52 health districts in the country in 2012. Gert Sibande antenatal HIV prevalence has significantly declined from 46.1% in 2011 to 40.5% in 2012, a decrease by 5.6%. On the other hand, Nkangala antenatal HIV prevalence has increased from 29.6% in 2011 to 32.1% in 2012, though still the lowest in the province.

**Table 18:** HIV prevalence among antenatal women by district, Mpumalanga, 2010 to 2012.

| Mpumalanga | 2009 | | | 2010 | | | 2011 | | |
|---|---|---|---|---|---|---|---|---|---|
| | N | % Prev. | 95% CI | N | % Prev. | 95% CI | N | % Prev. | 95% CI |
| **Provincial** | **2 202** | **35.1** | **32.6 – 37.7** | **2 116** | **36.7** | **34.3 – 39.2** | **2 201** | **35.6** | **33.3 - 37.9** |
| Ehlanzeni | 1 074 | 37.7 | 34.1 – 41.4 | 1 027 | 35.8 | 32.2 – 39.7 | 1 002 | 35.1 | 32.3 - 38.0 |
| Gert Sibande | 528 | 38.2 | 33.7 – 44.2 | 518 | 46.1 | 41.4 – 50.9 | 536 | 40.5 | 35.8–45.3 |
| Nkangala | 600 | 27.2 | 22.8 – 32.1 | 571 | 29.6 | 25.6 – 34.0 | 644 | 32.1 | 27.4–37.3 |

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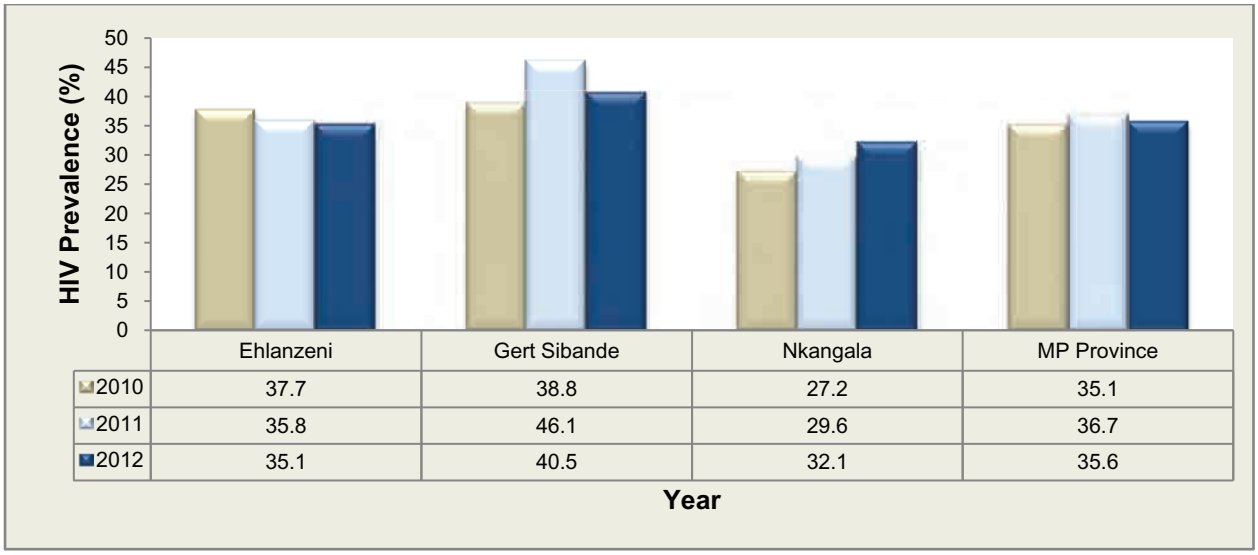



| | Ehlanzeni | Gert Sibande | Nkangala | MP Province |
|---|---|---|---|---|
| 2010 | 37.7 | 38.8 | 27.2 | 35.1 |
| 2011 | 35.8 | 46.1 | 29.6 | 36.7 |
| 2012 | 35.1 | 40.5 | 32.1 | 35.6 |

**Figure 34:** HIV prevalence trends among antenatal women, Mpumalanga, 2010 to 2012. (*Source*: NDoH, 2013)

A total of 503 (22.9%) of the women who participated in the 2012 survey in Mpumalanga, were under the age of 19 years. The majority (N = 637) of the survey participants were young adults, 20- 24 years, (Figure 35). Sixteen (16) of the women who participated in the survey were less than 15 years of age.

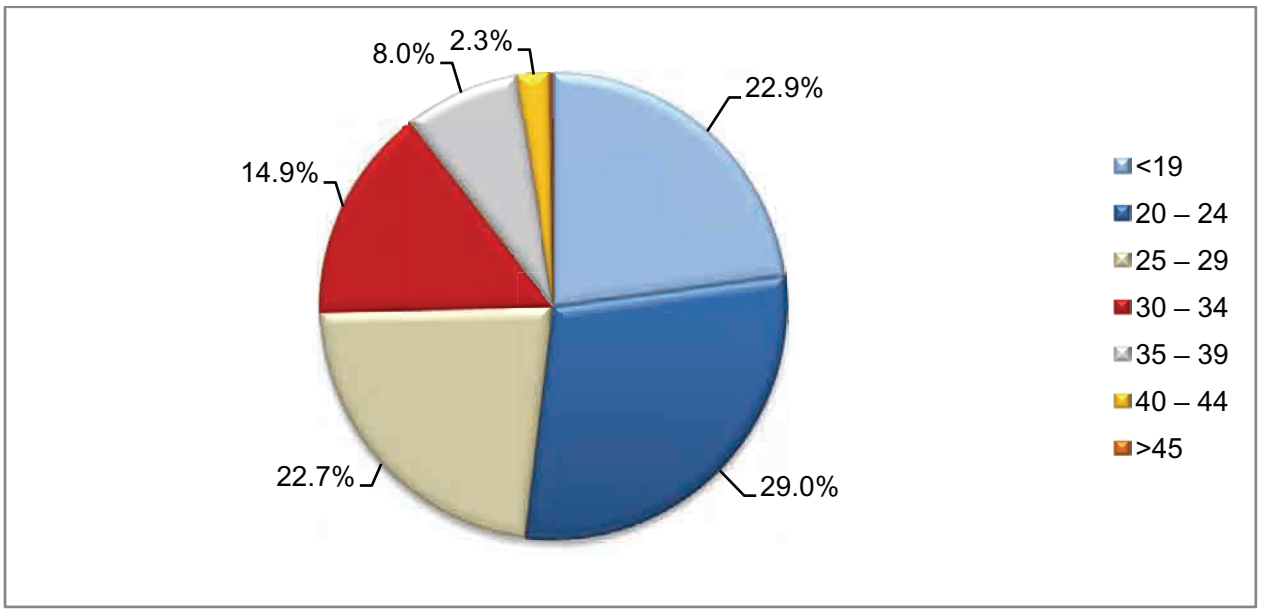



**Figure 35:** Sampled population distribution by age group, Mpumalanga, 2012

The 2012 HIV prevalence among 15 - 24 year olds (which is the Millennium Development Goal 6, Target 7 indicator 18 group) decreased from 25.6% in 2010 to 25.0% in 2011 and 23.7% in 2012. There was also a decrease in HIV prevalence among young women in the age group 15 - 19 years, from 17.4% in 2010 to 14.0% in 2011 to a very slight increase 0.4% in 2012 (Table 19).

**Table 19:** HIV prevalence among antenatal women by age group, Mpumalanga, 2010 to 2012.

| Age group (Years) | 2010 | | 2011 | | 2012 | |
|---|---|---|---|---|---|---|
| | N | % Prev. | N | % Prev. | N | % Prev. |
| <15 | 9 | 22.2 | 8 | 12.5 | 16 | 0.0 |
| 15 -19 | 507 | 17.4 | 470 | 14.0 | 487 | 14.4 |
| *15 - 24 | 1 163 | 25.6 | 1 126 | 25.0 | 1 124 | 23.7 |
| 20 – 24 | 656 | 32.0 | 656 | 32.8 | 637 | 30.8 |
| 25 – 29 | 495 | 46.1 | 489 | 48.9 | 500 | 48.4 |
| 30 – 34 | 302 | 53.6 | 290 | 53.8 | 328 | 49.7 |
| 35 – 39 | 142 | 38.7 | 154 | 52.6 | 175 | 48.0 |
| 40 – 44 | 55 | 30.9 | 53 | 34.0 | 50 | 40.0 |
| 45 – 49 | 8 | 37.5 | 4 | 24.0 | 5 | 20.0 |
| >49 | ** | ** | ** | ** | ** | ** |

The changes in the HIV prevalence between the districts in Mpumalanga province over the periods 2009, 2010, 2012 and 2012 are shown in Figure 36.

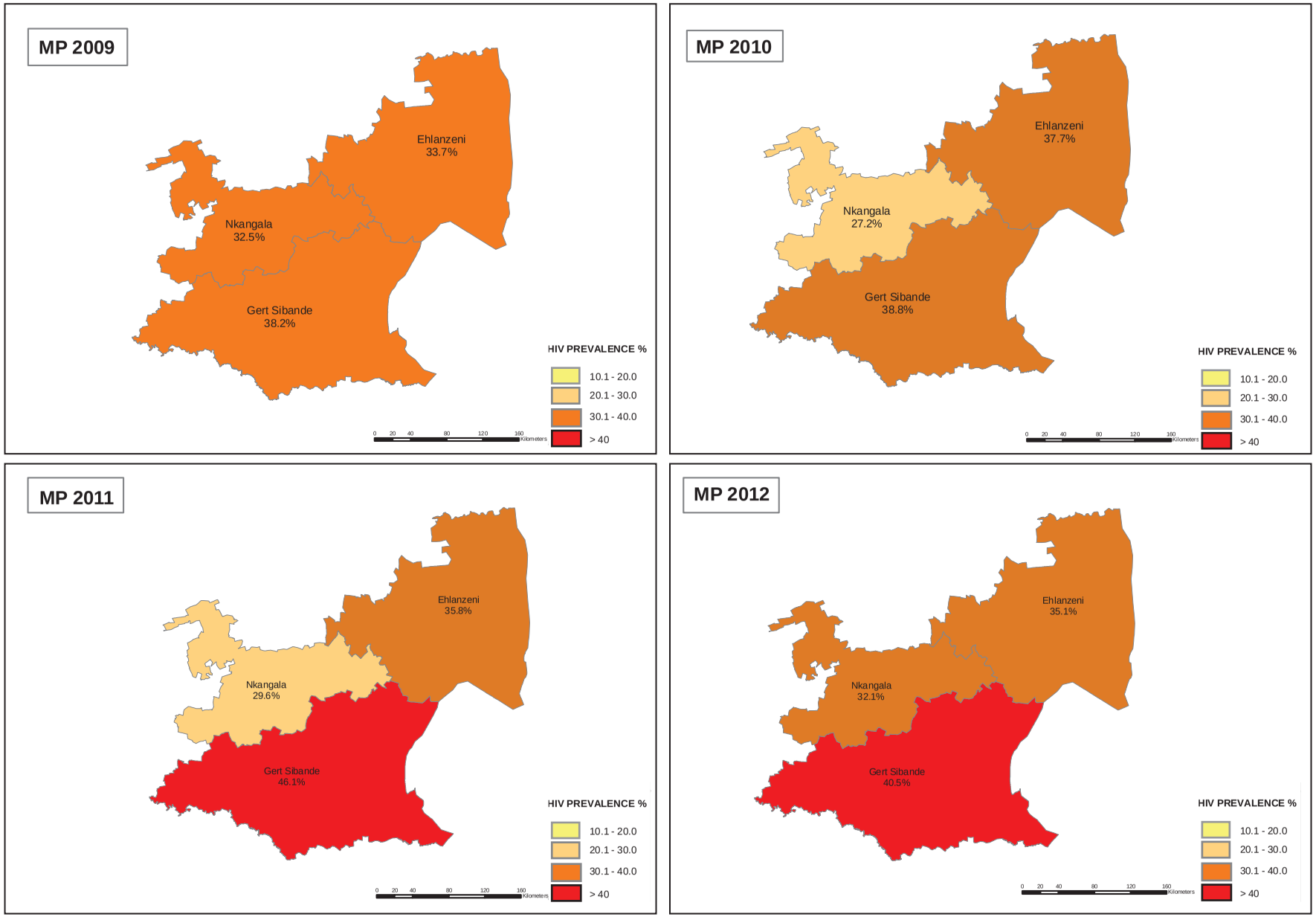



**Figure 36:** HIV prevalence distribution among survey participants by district in Mpumalanga, 2009 – 2012. (*Source*: NDoH, 2013)

### 3.9.7 THE NORTH WEST PROVINCE

In 2012, the North-West provincial HIV prevalence amongst antenatal women was 29.7% (95% CI: 27.5 – 32.0%). The HIV prevalence in this province has largely been stable in the last three years: 29.6% in 2010, 30.2% in 2011, and 29.7% in 2012 (Figure 37).

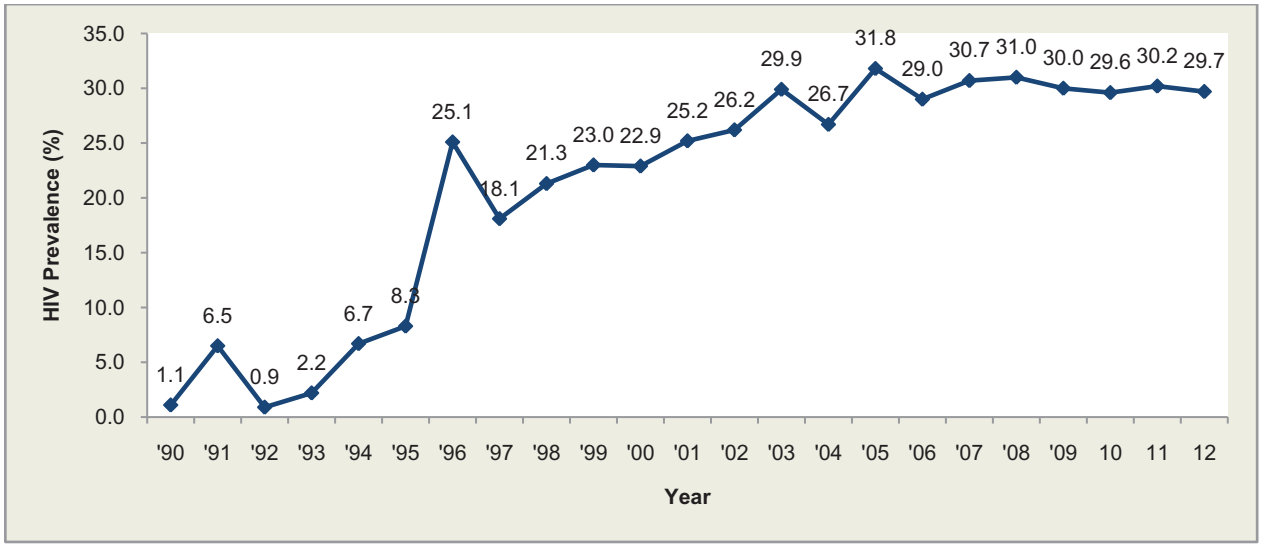
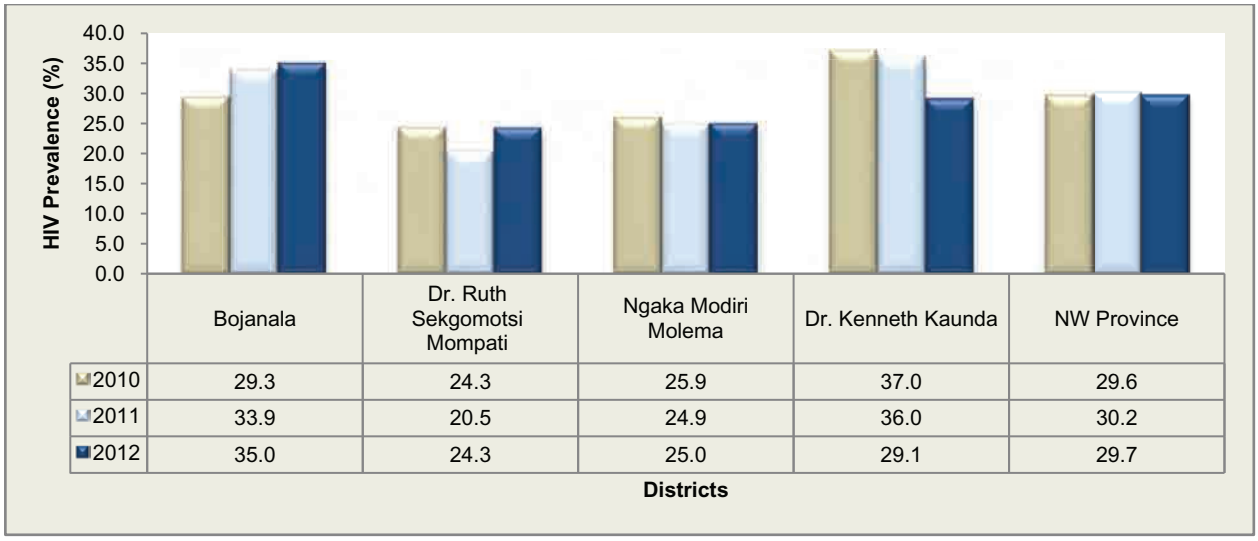



**Figure 37:** HIV epidemic curve among antenatal women, North West, 1990 to 2012. (*Source*: NDoH, 2013)

The distribution of the prevalence by the four districts in the province over the past three years is shown in Table 20 and Figure 38. The findings of the 2012 survey show a consistent gradual decrease in the prevalence for the Dr Kenneth Kaunda district from 37.0% in 2010 to 36.0% in 2011 to 29.1% in 2012. Bojanala district recorded an increase from 29.3% in 2010 to 33.9% in 2011 to 35.0%in 2012.

**Table 20:** HIV prevalence among antenatal women by district, North West, 2010 to 2012.

| North West | 2010 | | | 2011 | | | 2012 | | |
|---|---|---|---|---|---|---|---|---|---|
| | N | % Prev. | 95% CI | N | % Prev. | 95% CI | N | % Prev. | 95% CI |
| **Provincial** | **1 963** | **29.6** | **27.3 – 31.9** | **2 352** | **30.2** | **28.2 – 32.4** | **2 457** | **29.7** | **27.5–32.0** |
| Bojanala | 755 | 29.3 | 26.2 – 32.6 | 846 | 33.9 | 30.4 – 37.6 | 967 | 35.0 | 31.4 – 38.7 |
| Dr. R.S. Mompati | 272 | 24.3 | 20.4 – 28.6 | 336 | 20.5 | 16.8 – 24.9 | 374 | 24.3 | 19.7 - 29.6 |
| Ngaka M. Molema | 479 | 25.9 | 21.5 – 30.9 | 595 | 24.9 | 21.0 – 29.2 | 587 | 25.0 | 21.5 – 29.0 |
| Dr. K. Kaunda | 457 | 37.0 | 32.8 – 41.4 | 575 | 36.0 | 31.9 – 40.3 | 515 | 29.1 | 24.7 – 34.0 |




| | Bojanala | Dr. Ruth Sekgomotsi Mompati | Ngaka Modiri Molema | Dr. Kenneth Kaunda | NW Province |
|---|---|---|---|---|---|
| 2010 | 29.3 | 24.3 | 25.9 | 37.0 | 29.6 |
| 2011 | 33.9 | 20.5 | 24.9 | 36.0 | 30.2 |
| 2012 | 35.0 | 24.3 | 25.0 | 29.1 | 29.7 |

**Figure 38:** HIV prevalence trends among antenatal women, North West, 2010 to 2012. (*Source*: NDoH, 2013)

Five (5) of the pregnant women who participated in the 2012 survey in this province were under the age of 15 years. The majority (30.0%) of the survey participants were women aged 20 – 24 years (Figure 39).

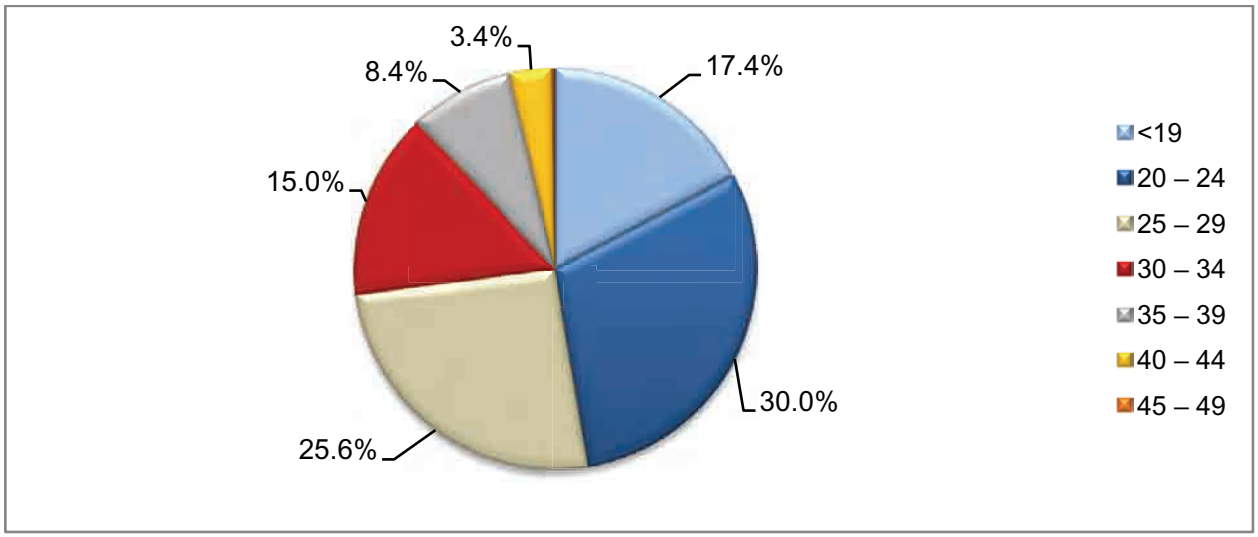



**Figure 39:** Sampled population distribution by age group, North West, 2012.

The HIV prevalence among the 15 - 24 year olds (which is the Millennium Development Goal 6, Target 7 indicator 18 group) was 22.2.% in 2010, 21.3% in 2011 and 18.1% in 2010, a decrease in the three-year period. The decreasing trend in the prevalence was also observed among young women in the age group 15 - 19 years. The HIV prevalence among women in the age groups 25 -29 years has increased from 31.9% in 2010 to 34.8% in 2011 to 39.5% in 2012. Other age groups had erratic changes which may be attributed to smaller sample sizes (Table 21).

**Table 21:** HIV prevalence among antenatal women by age group, North West, 2009 to 2012.

| Age group (Years) | 2010 | | 2011 | | 2012 | |
|---|---|---|---|---|---|---|
| | N | % Prev. | N | % Prev. | N | % Prev. |
| <15 | 4 | 0.0 | 5 | 20.0 | 5 | 20.0 |
| 15 -19 | 334 | 14.1 | 397 | 13.4 | 421 | 11.6 |
| *15 - 24 | 917 | 22.2 | 1 086 | 21.3 | 1 155 | 18.1 |
| 20 – 24 | 583 | 26.9 | 689 | 25.8 | 734 | 21.8 |
| 25 – 29 | 452 | 31.9 | 575 | 34.8 | 626 | 39.5 |
| 30 – 34 | 344 | 41.9 | 393 | 40.7 | 367 | 42.2 |
| 35 – 39 | 187 | 36.9 | 227 | 39.6 | 206 | 41.3 |
| 40 – 44 | 42 | 33.3 | 61 | 42.6 | 84 | 33.3 |
| 45 – 49 | 5 | 40.0 | 10 | 40.0 | 5 | 40.0 |
| >49 | ** | ** | ** | ** | ** | ** |

The changes in the HIV prevalence between the districts in the North West province over the periods 2009, 2010, 2012 and 2012 are shown in Figure 40.

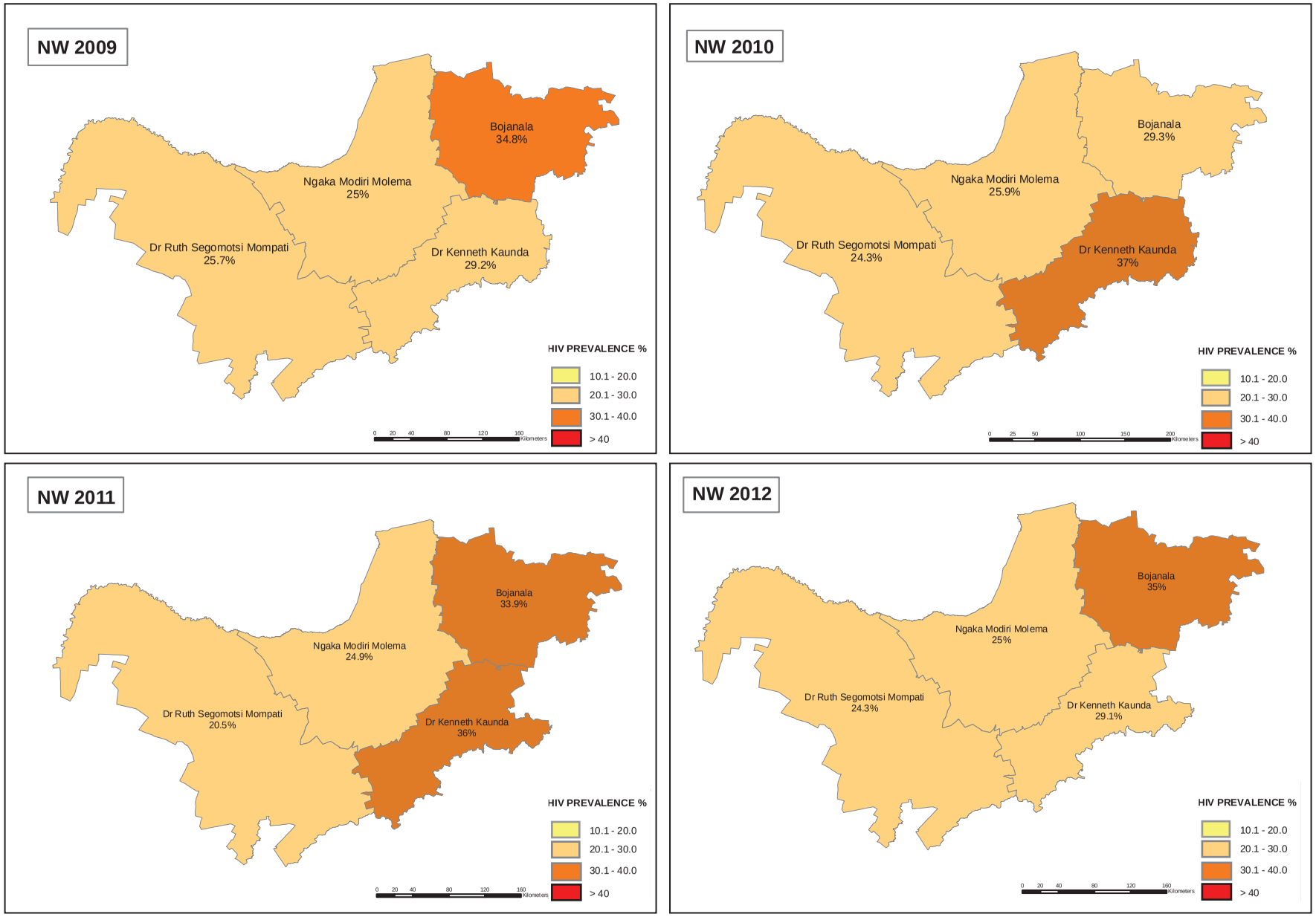



**Figure 40:** HIV prevalence distribution among survey participants by district in the North West, 2009 – 2012.*Source*: NDoH, 2013)

### 3.9.8 THE NORTHEN CAPE PROVINCE

In 2012, the Northern Cape provincial HIV prevalence amongst antenatal women was 17.8% (95% CI: 15.3 – 20.7). The province has consistently been recording one of the lowest antenatal HIV prevalence at around 17.0% for the past few years (Figure 41).

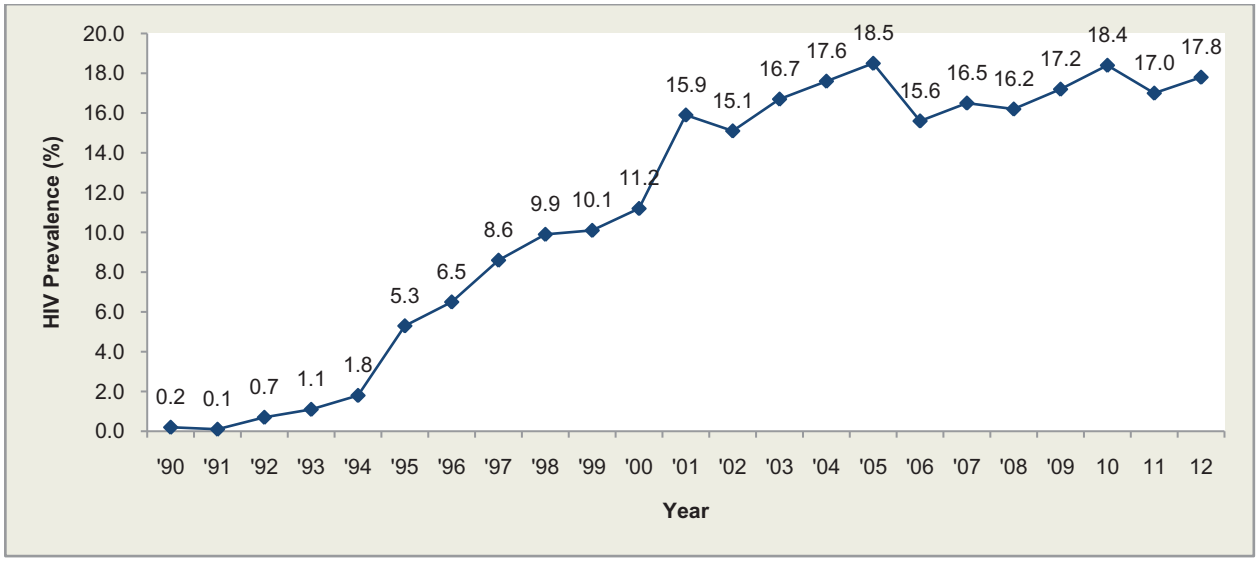
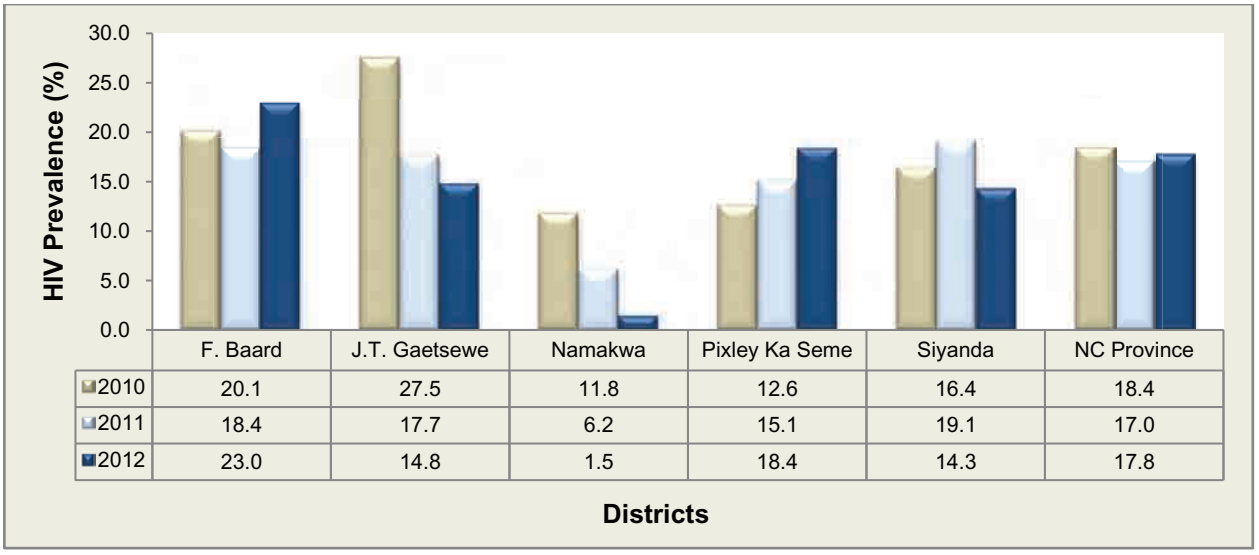



**Figure 41:** HIV epidemic curve among antenatal women, Northern Cape 1990 to 2012. (*Source*: NDoH, 2013)

The trends in district prevalence rates in this province from 2010 to 2012 are shown in Table 22 and Figure 42. In 2012, the antenatal HIV prevalence in Namaqua was 1.5%, and even though the district is experiencing a decreasing trend, the sample sizes in the district are very small, making it difficult to discern any trends. This has resulted in very wide confidence intervals. Namaqua district has recorded the lowest antenatal HIV prevalence among the 52 health districts. J.T. Gaetsewe district has also consistently recorded decreasing HIV prevalence in the Northern Cape from 2010 to 2012. Pixley ka Seme has been recording increasing HIV prevalence in the same period. Francis Baard at a prevalence of 23.0% has the highest HIV prevalence in the province, up from 18.4% in 2011.

**Table 22:** HIV prevalence among antenatal women by district, Northern Cape, 2010 to 2012.

| Northern Cape | 2010 | | | 2011 | | | 2012 | | |
|---|---|---|---|---|---|---|---|---|---|
| | N | % Prev. | 95% CI | N | % Prev. | 95% CI | N | % Prev. | 95% CI |
| **Provincial** | **1 144** | **18.4** | **16.1 – 21.1** | **1 125** | **17.0** | **14.3 – 20.0** | **1 190** | **17.8** | **15.3 - 20.7** |
| F. Baard | 432 | 20.1 | 17.3 – 23.3 | 419 | 18.4 | 13.8 – 24.1 | 452 | 23.0 | 18.5 - 28.2 |
| J. T. Gaetsewe | 182 | 27.5 | 22.2 – 33.5 | 175 | 17.7 | 11.6 – 26.2 | 183 | 14.8 | 10.4 - 20.5 |
| Namakwa | 76 | 11.8 | 6.6 – 20.3 | 65 | 6.2 | 2.6 – 13.7 | 66 | 1.5 | 0.2–10.2 |
| Pixley ka Seme | 247 | 12.6 | 8.6 – 17.9 | 251 | 15.1 | 10.4 – 21.5 | 234 | 18.4 | 12.7 - 25.9 |
| Siyanda | 207 | 16.4 | 11.0 – 23.9 | 215 | 19.1 | 14.0 – 25.5 | 238 | 14.3 | 9.8–20.4 |




| | F. Baard | J.T. Gaetsewe | Namakwa | Pixley Ka Seme | Siyanda | NC Province |
|---|---|---|---|---|---|---|
| 2010 | 20.1 | 27.5 | 11.8 | 12.6 | 16.4 | 18.4 |
| 2011 | 18.4 | 17.7 | 6.2 | 15.1 | 19.1 | 17.0 |
| 2012 | 23.0 | 14.8 | 1.5 | 18.4 | 14.3 | 17.8 |

**Figure 42:** HIV prevalence trends among antenatal women, Northern Cape, 2010 to 2012. (*Source*: NDoH, 2013)

The age distribution of pregnant women who participated in the 2012 survey in the Northern Cape is shown in Figure 43. Five (5) of the pregnant women who participated in the 2012 survey in this province were under the age of 15 years. The majority (28.0%) of the survey participants from this province were women aged 20 – 24 years.

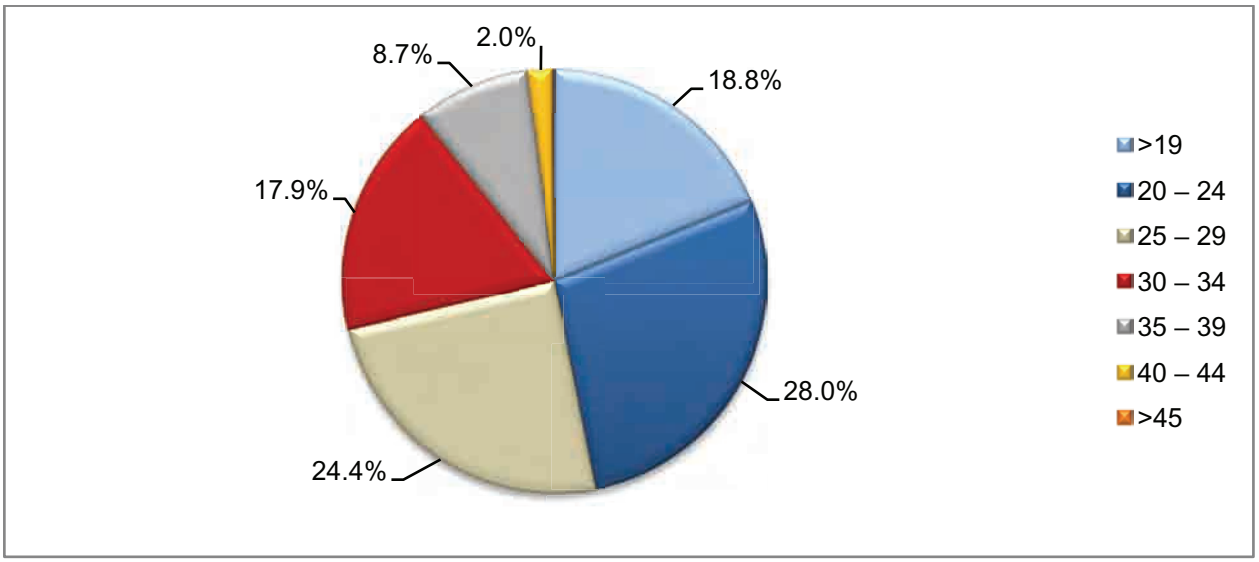



**Figure 43:** Sampled population distribution by age group, Northern Cape, 2012.

The findings of monitoring age HIV prevalence trends in the Northern Cape showed that in the age group 35 - 39 years the prevalence has substantially reduced from 30.7% in 2010 to 16.5% in 2011 to 19.4 in 2012. There was an increase among the 40 - 44 year old group from 20.0% in 2011 to 26.1% in 2012 (Table 23). In 2012, the HIV prevalence among the 15 - 24 year olds (which is the Millennium Development Goal 6, Target 7 indicator 18 group) remained unchanged at approximately 12% in 2010, 2011 and 2012. This MDG group constituted almost 50% (N = 547) of the survey population.

**Table 23:** HIV prevalence among antenatal women by age group, Northern Cape, 2010 to 2011.

| Age group (Years) | 2010 | | 2011 | | 2012 | |
|---|---|---|---|---|---|---|
| | N | % Prev. | N | % Prev. | N | % Prev. |
| <15 | 6 | 16.7 | 3 | 0.0 | 5 | 0.0 |
| 15 -19 | 265 | 8.7 | 222 | 8.1 | 217 | 6.5 |
| *15 - 24 | 571 | 12.4 | 547 | 12.8 | 547 | 11.5 |
| 20 – 24 | 306 | 15.7 | 325 | 16.0 | 330 | 14.9 |
| 25 – 29 | 250 | 24.0 | 273 | 21.6 | 288 | 22.2 |
| 30 – 34 | 173 | 22.5 | 179 | 22.3 | 211 | 26.5 |
| 35 – 39 | 101 | 30.7 | 97 | 16.5 | 103 | 19.4 |
| 40 – 44 | 30 | 23.3 | 25 | 20 | 23 | 26.1 |
| 45 – 49 | 2 | 0.0 | 4 | 25 | 1 | 0.0 |
| >49 | 1 | 0.0 | ** | ** | ** | ** |

The variation in HIV prevalence distribution in Limpopo from 2010 to 2012 is shown in Figure 44.

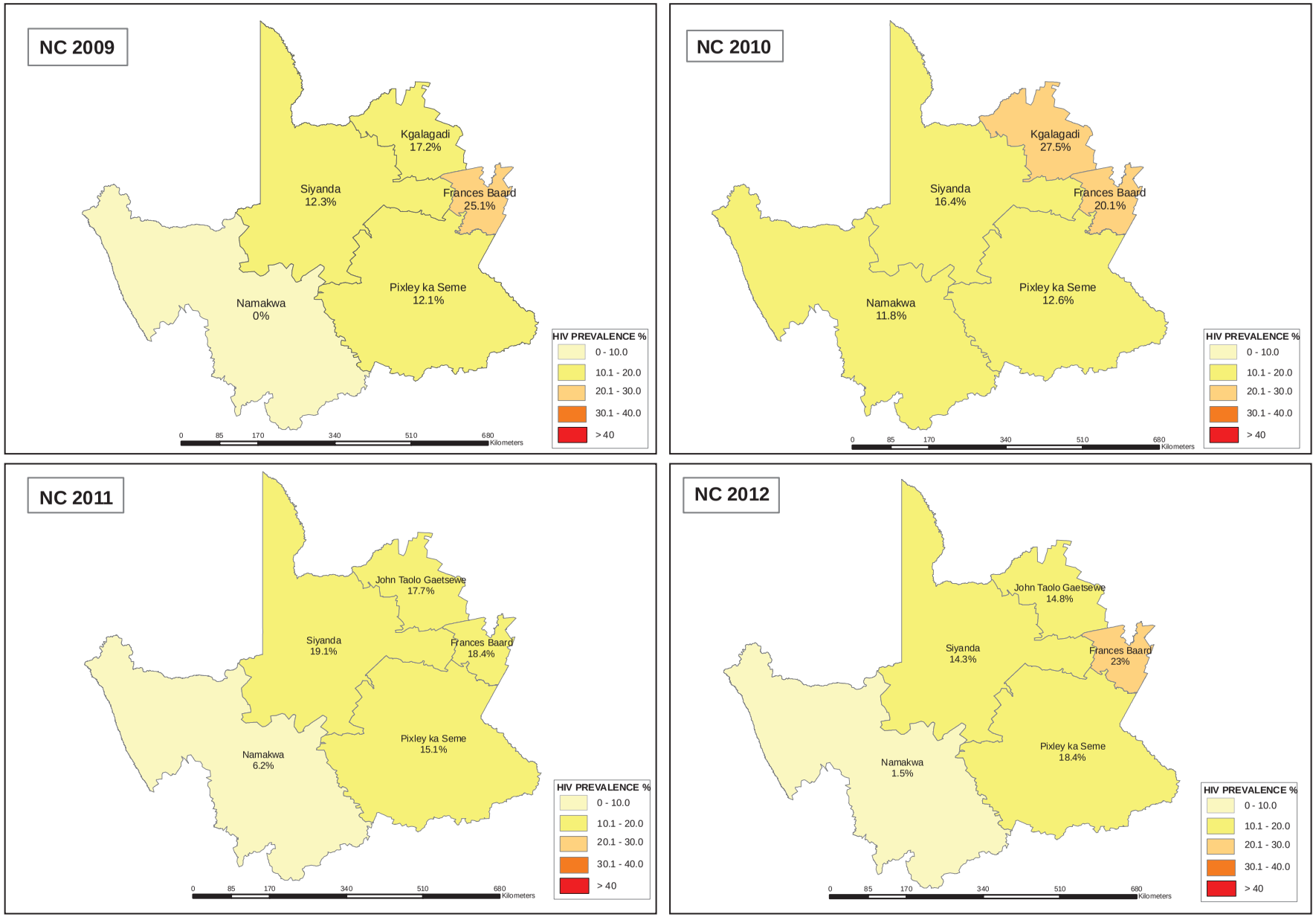



**Figure 44:** HIV prevalence distribution among survey participants by district in the Northern Cape, 2009 - 2012. (*Source*: NDoH, 2013)

### 3.9.9 THE WESTERN CAPE PROVINCE

In 2012, the Western Cape provincial HIV prevalence amongst antenatal women was 16.9% (95% CI: 13.8 – 20.5%). The overall HIV prevalence decreased from 18.5% in 2010 to 16.9% in 2012, a decrease of 2.6% (Figure 45).

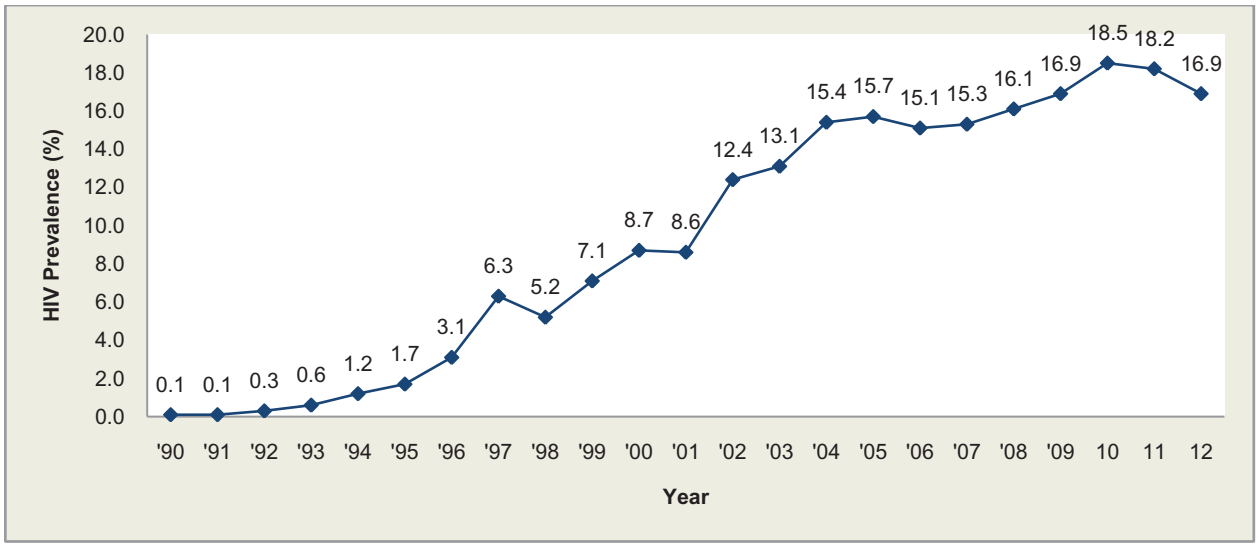
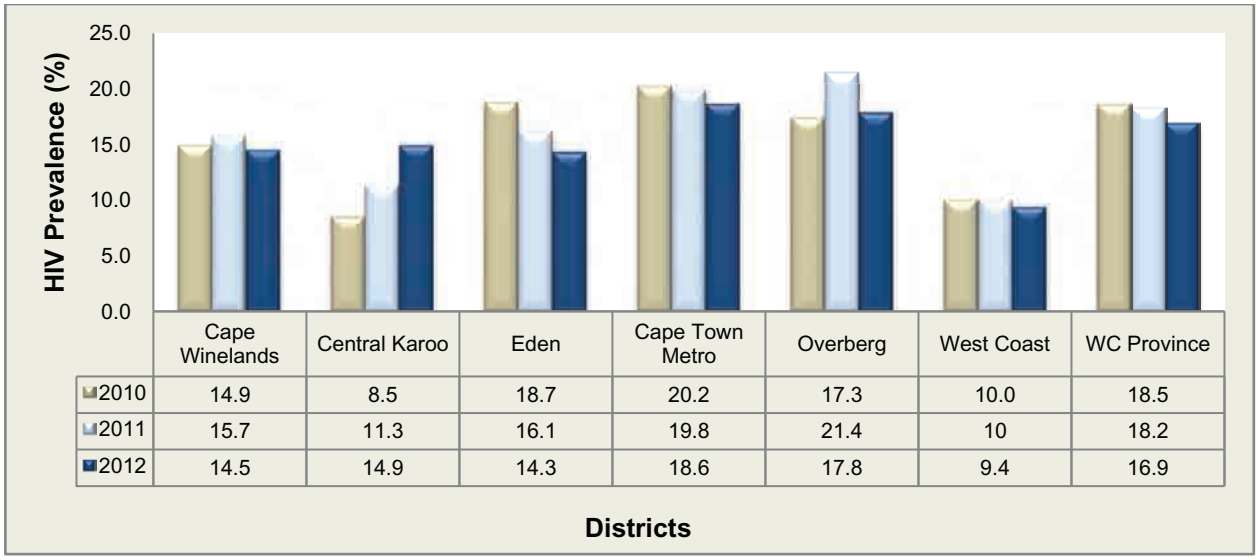



**Figure 45:** HIV epidemic curve among antenatal women, Western Cape 1990 to 2012. (*Source*: NDoH, 2013)

The Cape Metro carries the heaviest burden of HIV in the Western Cape, with more than 70% of the HIV infected pregnant women in the province, even though the metro has recorded a slight decrease of 1.2% from 19.8% in 2011 to 18.6% in 2012. HIV prevalence in the West Coast has remained at or below 10% for the past three years. The Central Karoo district has shown an increase of 2.7% from 8.5% in 2010 to 11.3% in 2011 and a further increase to 14.9% in 2012 (Table 24 and Figure 46). Overberg has recorded a decrease from 21.4% in 2011 to 17.8% in 2012

**Table 24:** HIV prevalence among antenatal women by district, Western Cape, 2010 to 2012.

| Western Cape | 2010 | | | 2011 | | | 2012 | | |
|---|---|---|---|---|---|---|---|---|---|
| | N | % Prev. | 95% CI | N | % Prev. | 95% CI | N | % Prev. | 95% CI |
| **Provincial** | **3 981** | **18.5** | **15.1 – 22.5** | **4 029** | **18.2** | **14.3 – 22.8** | **4 010** | **16.9** | **13.8–20.5** |
| C. Winelands | 557 | 14.9 | 10.4 – 20.9 | 593 | 15.7 | 10.3 – 23.1 | 587 | 14.5 | 9.6 – 21.2 |
| Central Karoo | 59 | 8.5 | 3.1 – 20.9 | 62 | 11.3 | 9.0 – 14.0 | 74 | 14.9 | 9.1 – 23.4 |
| Eden | 353 | 18.7 | 13.6 – 25.2 | 373 | 16.1 | 11.1 – 22.7 | 364 | 14.3 | 10.3–19.5 |
| Cape Metro | 2 656 | 20.2 | 15.7 – 25.6 | 2 570 | 19.8 | 14.4 – 26.7 | 2 468 | 18.6 | 14.2 –23.9 |
| Overberg | 156 | 17.3 | 11.9 – 24.5 | 178 | 21.4 | 12.0 – 35.1 | 180 | 17.8 | 11.5–26.5 |
| West Coast | 200 | 10.0 | 6.6 – 14.9 | 253 | 10.0 | 6.2 – 15.4 | 235 | 9.4 | 5.9 - 14.5 |




| | Cape Winelands | Central Karoo | Eden | Cape Town Metro | Overberg | West Coast | WC Province |
|---|---|---|---|---|---|---|---|
| 2010 | 14.9 | 8.5 | 18.7 | 20.2 | 17.3 | 10.0 | 18.5 |
| 2011 | 15.7 | 11.3 | 16.1 | 19.8 | 21.4 | 10 | 18.2 |
| 2012 | 14.5 | 14.9 | 14.3 | 18.6 | 17.8 | 9.4 | 16.9 |

**Figure 46:** HIV prevalence trends among antenatal women, Western Cape, 2010 to 2012. (*Source*: NDoH, 2013)

In the Western Cape the age distribution of pregnant women who participated ranged from seventeen (17) under 15 year olds to six (6) women in the age group 45 - 49 years. The majority of the survey participants were between 20 and 24 years (Figure 47).

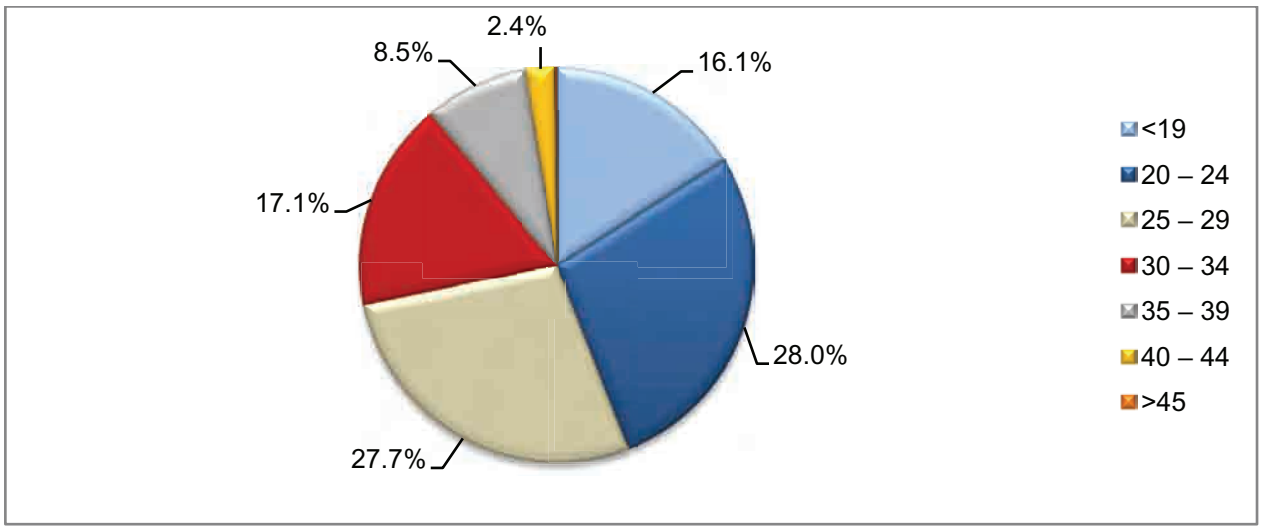



**Figure 47:** Sampled population distribution by age group, Western Cape, 2012

In 2012, the HIV prevalence among the 15 - 24 year olds (which is the Millennium Development Goal 6, Target 7 indicator 18 group) in the Western Cape lowered to 9.6% (from 12.5% in 2010) (Table 25). The HIV prevalence among the 15 - 19 year old pregnant women was 7.7% in 2010, 7.4% in 2011 and 5.4% in 2012, a steady annual decrease.

**Table 25:** HIV prevalence among antenatal women by age group, Western Cape, 2009 to 2011.

| Age-group | 2010 | | 2011 | | 2012 | |
|---|---|---|---|---|---|---|
| | N | % Prev. | N | % Prev. | N | % Prev. |
| <15 | 18 | 5.6 | 15 | 6.7 | 17 | 0.0 |
| 15 -19 | 636 | 7.7 | 598 | 7.4 | 615 | 5.4 |
| *15 - 24 | 1 732 | 12.5 | 1 779 | 11.7 | 1 714 | 9.6 |
| 20 – 24 | 1 096 | 15.2 | 1 181 | 14.0 | 1 099 | 12.0 |
| 25 – 29 | 1 083 | 21.9 | 1 128 | 23.0 | 1 087 | 21.3 |
| 30 – 34 | 661 | 27.4 | 672 | 24.9 | 673 | 26.9 |
| 35 – 39 | 349 | 22.1 | 349 | 23.5 | 334 | 21.6 |
| 40 – 44 | 74 | 17.6 | 96 | 16.7 | 94 | 11.7 |
| 45 – 49 | 1 | 0.0 | 5 | 0.0 | 6 | 16.7 |
| >49 | ** | ** | ** | ** | ** | ** |

The variation in HIV prevalence distribution in Western Cape from 2010 to 2012 is shown in Fig. 48.

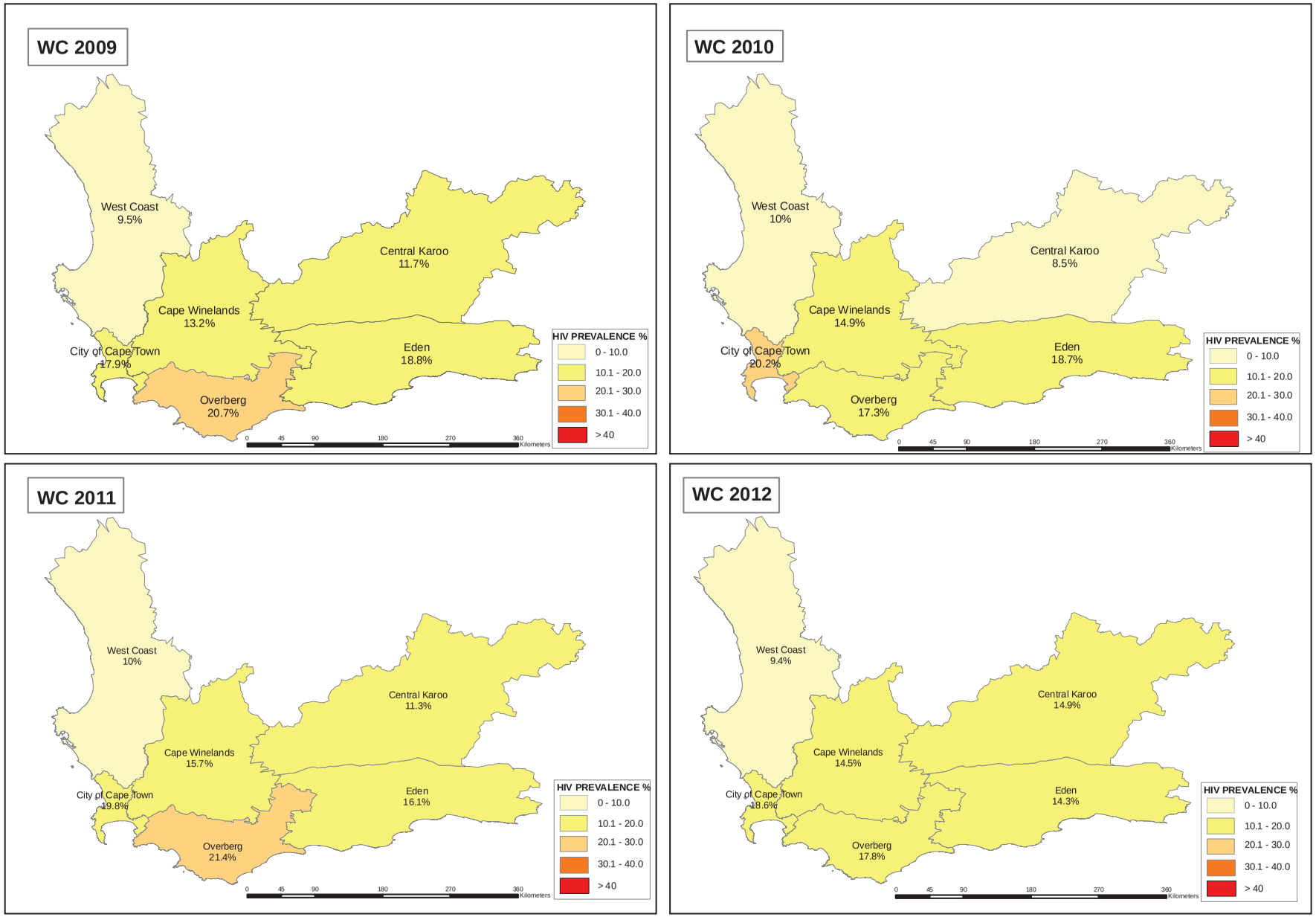



**Figure 48:** HIV prevalence distribution among survey participants by district in the Western Cape, 2009-2012. (*Source*: NDoH, 2013)

### 3.10 EXTRAPOLATION OF HIV INFECTION TO THE GENERAL POPULATION

National Spectrum HIV estimations and projections are generated periodically through epidemiological analysis and modeling. South Africa recently completed the estimation process with the overarching aim of generating national HIV estimates and projections and, for the first time, province specific estimates for 2012 and projections to 2016.The estimation process was carried out between March and August 2013, led by a national estimation team[1] constituted under the leadership of UNAIDS.

The South Africa 2012 national and provincial Spectrum HIV estimates made use of the most recent and comprehensive sets of epidemiological, demographic and programme data from surveys, surveillance and the DHIS. These estimates provide updated information on the current state of HIV epidemic in South Africa and provide a glimpse of future needs and impact. They provide direction on the spread, levels and trends of the HIV epidemic at national and provincial level and throw light on programme needs for future planning.

According to modelling using the 2013 UNAIDS Spectrum model, the estimated national HIV prevalence among the general adult population aged 15-49 years remained stable in 2012 at around 17.9% [17.3%-18.4%]. Despite the fact that the percentage of HIV positive people ("HIV prevalence") has plateaued over the last 7 years, the absolute number of people living with HIV is on the increase with approximately 100,000 additional people living with HIV each year. An estimated 6.1million [5.8million – 6.4million] adults and children living with HIV resided in South Africa in 2012. Children (<15 years) account for 4.5% (410,000) of the total HIV population. This is attributed to a combination of factors including the fact that the number of annual new HIV infections exceeds annual AIDS-related mortality, the life prolonging effects of ARV treatment and the yearly increase in population size. In 2012, the number of HIV positive young women 15 - 24 years was 710,000 [660,000 – 860,000], more than three times that of their male counterparts estimated at 200,000 [130,000 – 290,000]. However, women 15 years and older constitute 3.4million [3.2million -3.6million] or 55.7% of the total number of adults living with HIV in 2012.

Rates of HIV infection – HIV incidence – in South Africa continue to decrease. According to Spectrum, there were an estimated 370,000 [340,000 – 420,000] new infections in 2012 – the lowest annual number since 2008. HIV incidence among adults aged 15 - 49 years declined to 1.37% [1.28 -1.49] in 2012. HIV incidence among young people aged 15 - 24 years was 1.7% in 2012. The number of new HIV infections among children (0 - 14 years) declined substantially to an estimated 21,000 [19,000 - 32,000] in 2012. The declining trends can be attributed to the acceleration of Prevention of Mother-to-Child Transmission services.

[1]Members of the estimation team comprised of demographers, epidemiologists, medical doctors and public health specialists drawn from NDOH, STATS-SA, NICD, HSRC, CDC, HE2RO , UNICEF, WHO and USAID. The estimation team undertook several revisions of the national spectrum file, including disaggregation of ANC surveillance data by site and backdating the data to run from 1990, updating of the treatment numbers, and building assumptions about the future treatment program based on current coverage and targets. The latest tools and methods recommended by the Global Reference Group on Estimations, Projections and Modelling were adapted and customised adequately to suit the South Africa epidemic and country requirements.

In 2012, an estimated 280,000 [260,000 – 310,000] women in need were receiving PMTCT. Need for ART among adults aged 15 years and older increased to 2.5million [2.4 million–2.6million] in 2012. South Africa now has the largest antiretroviral programme in the world, with approximately 2,150,880 million people on HIV treatment[2].

Wider access to ART has led to a reduction in AIDS-related mortality. According to Spectrum estimates, AIDS related mortality in 2012 was 240,000 [220,000 – 270,000]. However, mortality remains high among HIV+ adults who are not receiving ART in 2012.

**Table 26:** Selected HIV estimates for South Africa, UNAIDS SPECTRUM, 2012. (*Source*: NDoH, 2013)

| Indicator | 2012 |
|---|---|
| **Total HIV population (adults and children)** | 6,100,000 [5,800,000-6,400,000] |
| **Adult HIV population (15+)** | 5,700,000 [5,500,000-6,000,000] |
| **Adult (15-49) HIV prevalence (%)** | 17.9 [17.3 - 18.4] |
| **Adult Male HIV population (15-24)** | 200,000 [130,000 - 290,000] |
| **Adult female HIV population (15-24)** | 710,000 [660,000 - 860,000] |
| **Adult HIV+ female population (15+)** | 3,400,000 [3,200,000 - 3,600,000] |
| **HIV population (children <15)** | 410,000 [370,000 -450,000] |
| **Total annual AIDS deaths** | 240,000 [220,000-270,000] |
| **New HIV infections 15-49 (%)** | 1.37[1.28-1.49] |
| **Total number of new HIV infections** | 370,000 [340,000-420,000] |
| **New infections (Children 0-14yrs)** | 21,000 [19,000-32,000] |
| **Total need for ART among adults (15+)** | 2,500,000 [2,400,000-2,600,000] |
| **Children needing ART** | 220,000 [210,000-250,000] |
| **Mothers needing PMTCT** | 280,000 [260,000-310,000] |

[2]SANAC (2013): Global AIDS progress Response: Mid-term Review of Progress in achieving the 2011 UN General Assembly Political Declaration on HIV/AIDS targets and elimination commitments in South Africa

# CHAPTER 4

## 4. HERPES SIMPLEX- Type 2 PREVALENCE

The overall prevalence of HSV-2 infection among antenatal women presenting at public health care clinics in the four pilot provinces: Gauteng, KwaZulu-Natal, Northern Cape and Western Cape in 2012 was estimated at 55.8% (95%CI: 55.1 – 56.5%) as shown in table 27.

### 4.1 HSV-2 prevalence by the four pilot provinces in 2012

The estimated prevalence rates of HSV-2 by the four provinces are shown in Table 27 and Figure 49 below. Even though the HSV-2 prevalence is very high among the four provinces, there is clearly provincial heterogeneity with respect to the prevalence. Gauteng and KwaZulu-Natal recorded the highest HSV-2 prevalence at 58.4% (95%CI: 57.2 - 59.5%) and 60.2% (95% CI: 59.0  61.2%), respectively. The Northern Cape and Western Cape experienced the lowest prevalence at 47.1% (95%CI: 44.3 - 50.0%) and 46.3% (95%CI: 44.7 - 47.9%) respectively.

**Table 27**: HSV-2 prevalence among antenatal women Gauteng, KwaZulu-Natal, Northern Cape and Western Cape, 2012. (*Source*: NDoH, 2013)

| Province | N | % Prevalence | 95% CI |
|---|---|---|---|
| **Gauteng** | 6 743 | 58.4 | 57.2 - 59.5 |
| **KwaZulu-Natal** | 6 933 | 60.2 | 59.0 - 61.2 |
| **Northern Cape** | 1 173 | 47.1 | 44.3 - 50.0 |
| **Western Cape** | 3 886 | 46.3 | 44.7 - 47.9 |
| **Total (Pilot provinces)** | 18 732 | 55.8 | 55.1 – 56.5 |

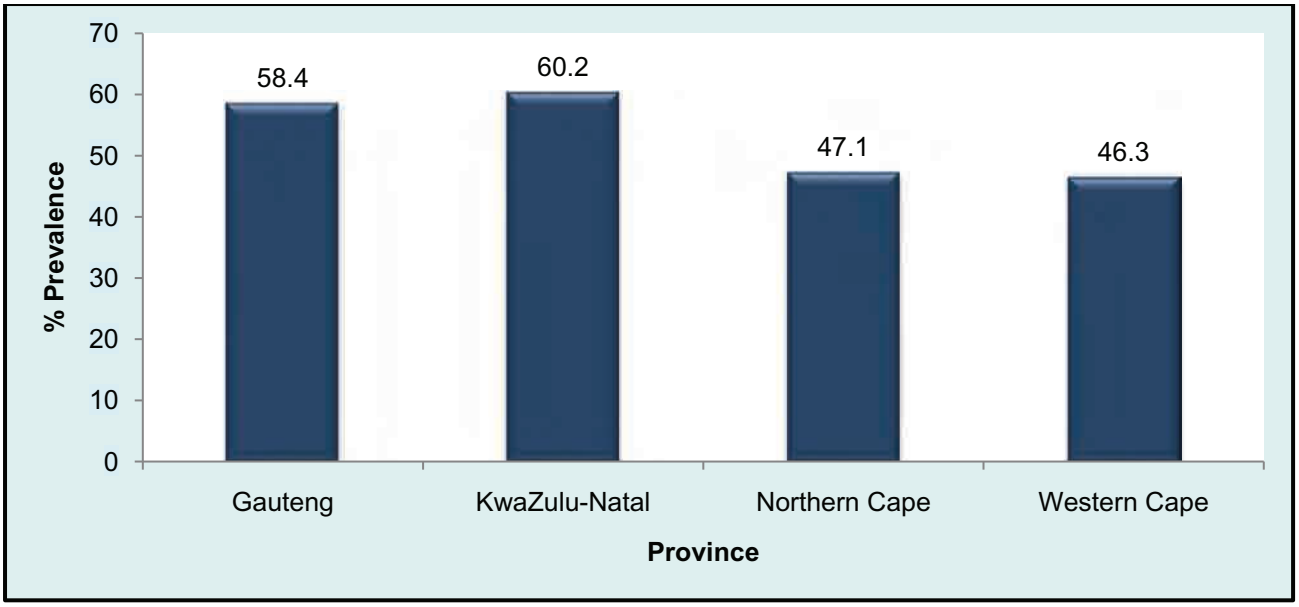



**Figure 49:** HSV-2 prevalence among antenatal women, Gauteng, KwaZulu-Natal, Northern Cape and Western Cape, 2012 irrespective of their HIV status. (*Source*: NDoH, 2013)

## 4.2 HSV-2 prevalence by age

The estimated national HSV-2 prevalence by age group for the 2012 antenatal first bookers in the sentinel public care clinics was weighted using a pooled population count based on the 2012 midyear estimates for the four provinces. The estimated HSV-2 prevalence by age group is shown in Table 28 and Figure 50. There is a clearly significant association between increasing HSV-2 prevalence with increasing age of the woman. The HSV-2 prevalence ranged from 28.4% among the 15 - 19 years old age group to a high of 91.7% among the 45 - 49 year old antenatal women who participated in the survey.

**Table 28:** HSV-2 prevalence among antenatal women Gauteng, KwaZulu-Natal, Northern Cape and Western Cape Provinces by age group, 2012.

| Age-group (Years) | Number | % Prevalence | 95% CI |
|---|---|---|---|
| 15 - 19 | 3 472 | 28.4 | 26.8 – 30.1 |
| 20 – 24 | 5 524 | 48.8 | 47.1 – 50.6 |
| 25 – 29 | 4 866 | 64.6 | 62.5 – 63.7 |
| 30 – 34 | 2 961 | 75.1 | 73.1 – 77.0 |
| 35 – 39 | 1 526 | 77.6 | 75.1 – 79.8 |
| 40 – 44 | 362 | 81.2 | 77.1 – 84.8 |
| 45 – 49 | 24 | 91.7 | 71.5 – 98.0 |

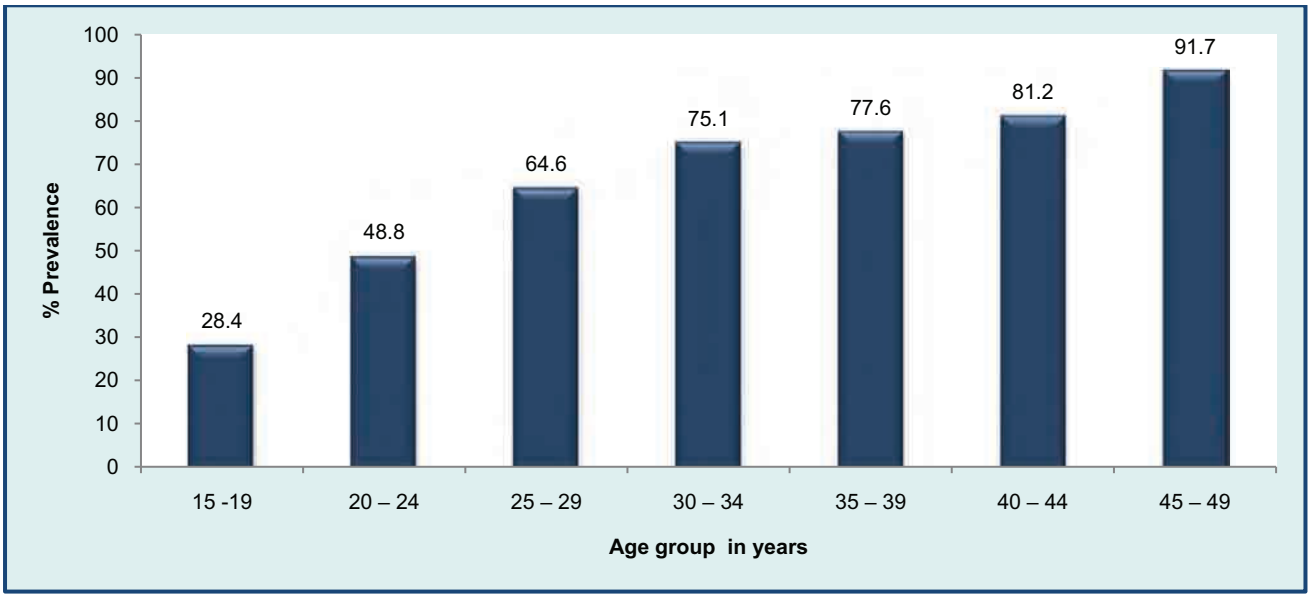



**Figure 50:** HSV-2 prevalence among antenatal women by age group, Gauteng, KwaZulu-Natal, Northern Cape and Western Cape, 2012. (*Source*: NDoH, 2013)

Further exploration of the association between age and HSV-2 was done within each of the four provinces. These associations are shown in Figure 51 below, where vertical dotted line is the overall weighted estimate across the four provinces (56.4%). While the positive linear relationship still holds in each province, Gauteng and KwaZulu-Natal have similar age profiles, as well as Northern Cape and Western Cape.

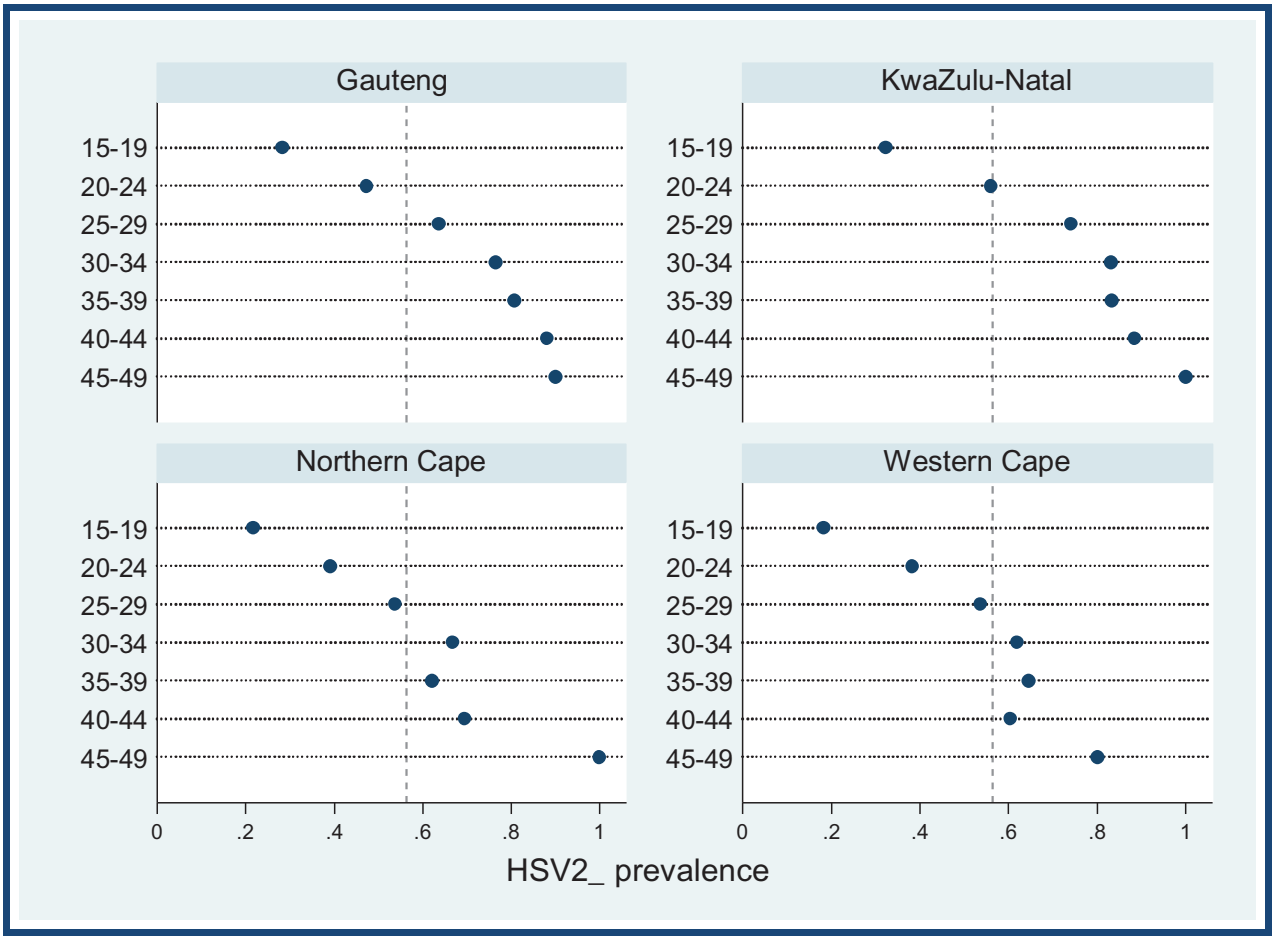



**Figure 51:** HSV-2 prevalence by age group (vertical dotted line pooled estimate across the four provinces 56.4%). (*Source*: NDoH, 2013)

### 4.3 HSV-2 prevalence by various background demographic characteristics

The prevalence of HSV-2 was estimated according to population group, urban or rural residence and the partner's age of the women who participated in the surveys (see Table 29). There is clear evidence that the HSV-2 prevalence is significantly depended on the population, with prevalence ranging from as low as 18.6% and 19.5% among the Asians and White women to as a high of 60.8 among the Black African, with the Coloured at the middle with 30.3%. There was a slightly higher prevalence in urban, than in rural, facilities. Increasing age of partner was positively associated with increasing HSV-2 prevalence of the women. These results should also be expected as age of partner was associated with age of women and hence we see the same trend as with age of women – increase of prevalence with increased age.

**Table 29:** Association between the demographic and background characteristics and HSV-2 outcome status of survey participants, 2012. (*Source*: NDoH, 2013)

| Variable | 2012 | | | |
|---|---|---|---|---|
| | Level | N | % Prevalence | 95% CI |
| **Population group** | African | 15 802 | 60.6 | 59.6 – 61.6 |
| | Asian | 166 | 18.6 | 13.7 – 24.9 |
| | Coloured | 2 590 | 30.3 | 27.5 – 33.3 |
| | White | 126 | 19.5 | 12.8 – 28.5 |
| **Urban/Rural** | Rural | 6 200 | 54.1 | 52.3 – 55.9 |
| | Urban | 12 535 | 57.4 | 55.7-59.1 |
| **Age of Partner** | 15 - 24 | 4 740 | 31.6 | 30.1 – 33.2 |
| | 25 - 34 | 9 236 | 59.3 | 57.7 – 60.9 |
| | 35 - 44 | 3 995 | 74.2 | 72.3 – 76.0 |
| | 45 - 54 | 541 | 81.1 | 77.7 – 84.1 |
| | 55 - 64 | 67 | 90.7 | 81.8 – 95.5 |
| | 65+ | 6 | 100 | - |

## 4.4 HSV–2 prevalence by individual province

For each of the four provinces that were studied, the estimated HSV-type 2 prevalence by districts was investigated.

### 4.4.1 HSV- 2 PREVALENCE IN GAUTENG

The overall 2012 HSV-2 prevalence amongst 15 - 49 year old antenatal women in the Gauteng province was estimated at 58.4% (95%CI: 57.2 - 59.5%). The district level estimated HSV-2 prevalence within the Gauteng province is shown in Table 30 and Figure 52. Generally, there are no major differences in the five districts that had data on HSV-2.

**Table 30**: HSV-2 prevalence among antenatal women by district, Gauteng, 2012.

| Districts | N | % Prev. | 95% CI |
|---|---|---|---|
| City of JHB | 2 267 | 58.5 | 56.1 – 60.8 |
| Ekurhuleni | 1 753 | 60.5 | 57.5 – 63.4 |
| Sedibeng | 587 | 55.7 | 48.6 – 62.6 |
| Tshwane | 1 571 | 56.0 | 52.0 – 59.9 |
| West Rand | 565 | 60.9 | 55.5 – 66.0 |

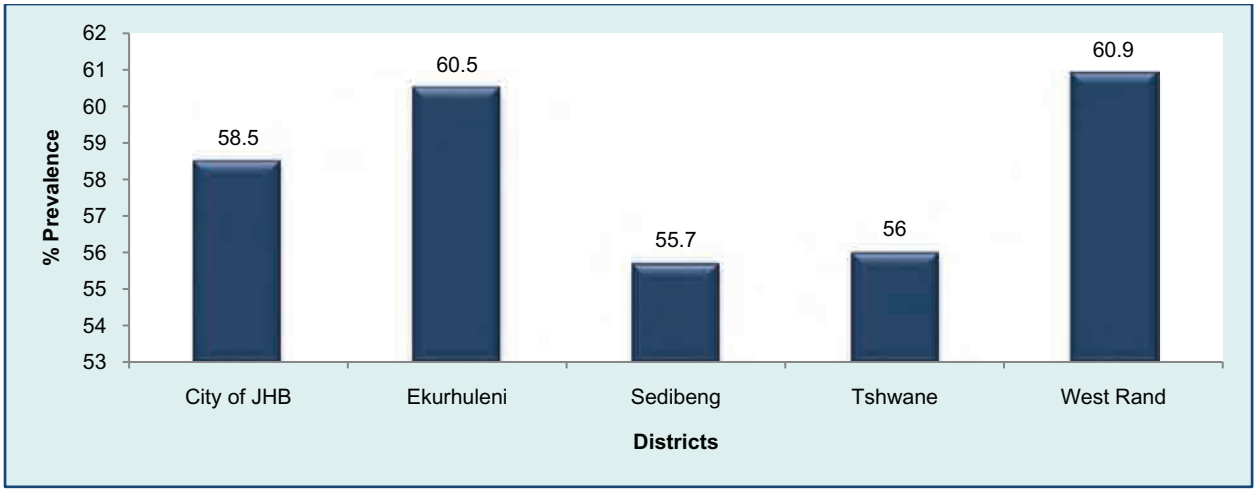



**Figure 52:** HSV-2 prevalence among antenatal women by district, Gauteng, 2012. (*Source*: NDoH, 2013)

### 4.4.2 HSV-2 PREVALENCE IN KWAZULU-NATAL

The overall 2012 HSV-2 prevalence amongst 15 - 49 year old antenatal women in the KwaZulu-Natal province was estimated at 60.2% (95%CI: 59.0 - 61.2%).The district level estimated HSV-2 prevalence within the KwaZulu-Natal province is shown in Table 29 and Figure 53. There is clear district heterogeneity with respect to HSV-2 prevalence, ranging from a low of 48.8% in uMzinyathi to a high of 64.8% in uMgungundlovu.

**Table 31**: HSV-2 prevalence among antenatal women by district, KwaZulu-Natal, 2012.

| District | Number | %Prevalence | 95% CI |
|---|---|---|---|
| Amajuba | 415 | 58.6 | 54.1 – 62.9 |
| Sisonke | 337 | 57.0 | 53.2 – 60.6 |
| Ugu | 477 | 61.6 | 57.1 – 66.0 |
| uMkhanyakude | 406 | 58.4 | 51.1 – 65.3 |
| uMzinyathi | 336 | 48.8 | 42.3 – 55.3 |
| uThukela | 445 | 56.9 | 50.0 – 63.5 |
| uThungulu | 606 | 60.4 | 55.1 – 65.4 |
| Zululand | 575 | 56.0 | 52.6 – 59.3 |
| eThekwini | 2 203 | 62.5 | 60.2 – 64.7 |
| ILembe | 432 | 62.7 | 57.3 – 67.8 |
| uMgungundlovu | 701 | 64.8 | 60.4 – 68.9 |

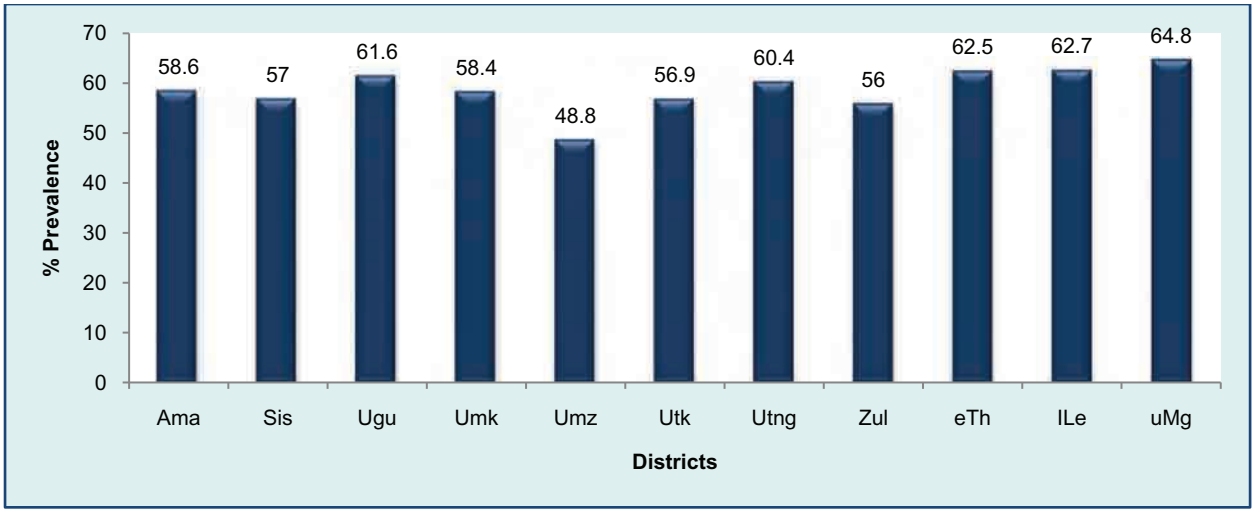



**Figure 53:** HSV-2 prevalence among antenatal women by district, KwaZulu-Natal, 2012. (*Source*: NDoH, 2013)

### 4.4.3 HSV-TYPE 2 PREVALENCE IN NORTHERN CAPE

The overall 2012 HSV-2 prevalence amongst 15-49 year old antenatal women in the Northern Cape province was estimated at 47.1% (95%CI: 44.3 - 50.0%). The district level estimated HSV-2 prevalence within the Northern Cape is shown in Table 32 and Figure 54. Even though Namaqua has the lowest prevalence at 36.4% and Francis Baard district the highest prevalence at 51.3%, the district-level variations appears not be statistically significant. This may be due to small sample sizes in some districts, especially Namaqua, such that the confidence intervals are wider.

**Table 32:** HSV-2 prevalence among antenatal women by district, Northern Cape, 2012.

| Districts | N | % Prev. | 95% CI |
|---|---|---|---|
| F. Baard | 452 | 51.3 | 46.5 – 56.1 |
| J. T. Gaetsewe | 183 | 46.5 | 39.9 – 53.1 |
| Namaqua | 66 | 36.4 | 23.9 – 51.0 |
| Pixley ka Seme | 234 | 41.5 | 36.0 – 47.1 |
| Siyanda | 238 | 48.3 | 38.3 - 58.5 |

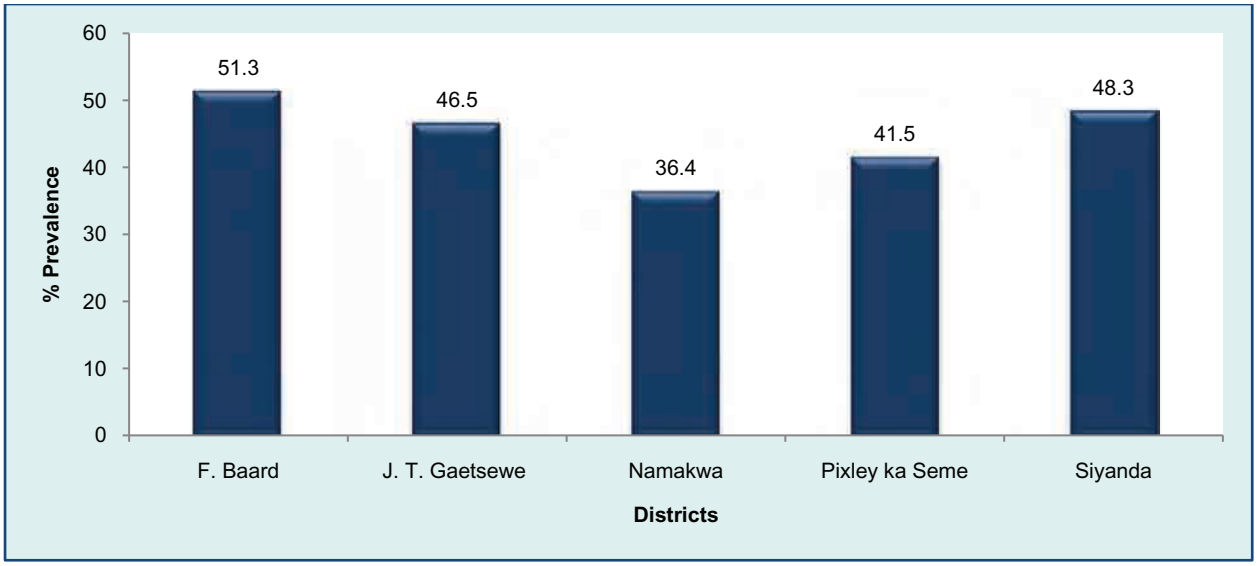



**Figure 54:** HSV-2 prevalence among antenatal women by district, Northern Cape, 2012. (*Source*: NDoH, 2013)

### 4.4.4 HSV-2 PREVALENCE IN WESTERN CAPE

The overall 2012 HSV-2 prevalence amongst 15-49 year old antenatal women in the Western Cape province was estimated at 46.3% (95%CI: 44.7 - 47.9%). The district level estimated HSV-2 prevalence within the Western Cape province is shown in Table 33 and Figure 55. The observed district level HSV-2 heterogeneity shows great variation; however the differences are not statistically significant. This may also be due to small sample sizes in some districts such that the confidence intervals are wider.

**Table 33:** HSV-2 prevalence among antenatal women by district, Western Cape, 2012. (*Source*: NDoH, 2013)

| Districts | N | % Prevalence | 95% CI |
|---|---|---|---|
| Cape Wine lands | 586 | 41.8 | 35.0 – 48.9 |
| Central Karoo | 73 | 41.1 | 26.4 – 57.6 |
| Eden | 361 | 48.9 | 37.3 – 52.7 |
| Metropole | 2 453 | 47.9 | 40.0 – 55.9 |
| Overberg | 178 | 51.1 | 40.6 – 61.6 |
| West Coast | 235 | 40.9 | 33.7 – 48.4 |

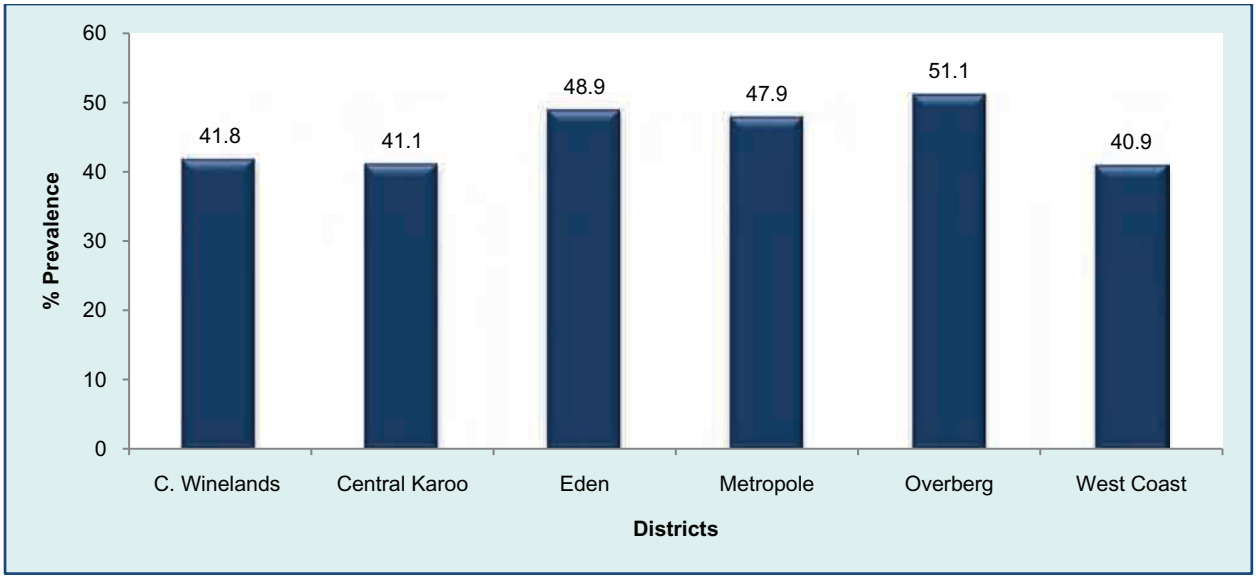



**Figure 55:** HSV-2 prevalence among antenatal women by district, Western Cape, 2012. (*Source*: NDoH, 2013)

## 4.5 HIV PREVALENCE BY HSV-TYPE 2 STATUS

The association between HIV and HSV-2 was investigated on the combined sample of the antenatal women in the four provinces that were studied for HSV-2 infection. Potential confounding factors such as the province and age were also investigated. The results are shown in Tables 34 to 38 and Figures 56 to 57.

Reading from Table 34, it is very clear that there is exceedingly high prevalence of HSV-2 in the HIV positive, compared to HIV negative women, 89.1% (95% CI: 88.2 - 89.9%) *vs*. 42.5% (95% CI: 41.1 - 43.8%).

**Table 34**: HIV prevalence by HSV-2 status among antenatal women Gauteng, KwaZulu-Natal, Northern Cape and Western Cape Provinces, 2012. (*Source*: NDoH, 2013)

| HSV-2 Result | HIV Result | | | | N |
|---|---|---|---|---|---|
| | Negative | | Positive | | |
| | % Prev. | 95% CI | % Prev. | 95% CI | |
| **Negative** | 57.5 | 56.2 – 58.9 | 42.5 | 41.1 – 43.8 | 13 252 |
| **Positive** | 11.0 | 10.1 – 11.8 | 89.1 | 88.2 – 89.9 | 5 483 |

In all of the four provinces, HSV-2 status is a strong indicator of HIV status among the antenatal women, with the prevalence ratio ranging from about 6 to 8.

**Table 35**: HSV-2 prevalence among antenatal women Gauteng, 2012. (*Source*: NDoH, 2013)

| HSV-2 Result | HIV Result | | | | N |
|---|---|---|---|---|---|
| | Negative | | Positive | | |
| | % Prevalence | 95% CI | % Prevalence | 95% CI | |
| **Negative** | 92.0 | 90.9 – 92.9 | 8.0 | 7.1 – 9.1 | 2 807 |
| **Positive** | 54.5 | 52.5 – 56.5 | 45.5 | 43.5 – 47.5 | 3 936 |

**Table 36**: HSV-type 2 prevalence among antenatal women KwaZulu-Natal, 2012. (*Source*: NDoH, 2013)

| HSV-2 Result | HIV Result | | | | N |
|---|---|---|---|---|---|
| | Negative | | Positive | | |
| | % Prevalence | 95% CI | % Prevalence | 95% CI | |
| **Negative** | 90.3 | 89.0 – 91.5 | 9.7 | 8.5 – 11.0 | 2 761 |
| **Positive** | 44.1 | 42.6 – 45.7 | 55.9 | 54.3 – 57.4 | 4 172 |

**Table 37**: HSV- 2 prevalence among antenatal women Northern Cape, 2012. (*Source*: NDoH, 2013)

| HSV-2 Result | HIV Result | | | | N |
|---|---|---|---|---|---|
| | Negative | | Positive | | |
| | % Prev | 95% CI | % Prev | 95% CI | |
| **Negative** | 95.5 | 93.2 – 97.0 | 4.5 | 3.0 – 6.8 | 620 |
| **Positive** | 67.3 | 62.2 – 72.0 | 32.7 | 28.0 – 37.8 | 553 |

**Table 38**: HSV- 2 prevalence among antenatal women Western Cape, 2012. (*Source*: NDoH, 2013)

| HSV-2 Result | HIV Result | | | | N |
|---|---|---|---|---|---|
| | Negative | | Positive | | |
| | % Prev. | 95% CI | % Prev. | 95% CI | |
| **Negative** | 96.1 | 94.4 – 97.3 | 3.9 | 2.7 – 5.6 | 2 087 |
| **Positive** | 67.9 | 64.4 – 71.3 | 32.1 | 28.7 – 35.7 | 1 799 |

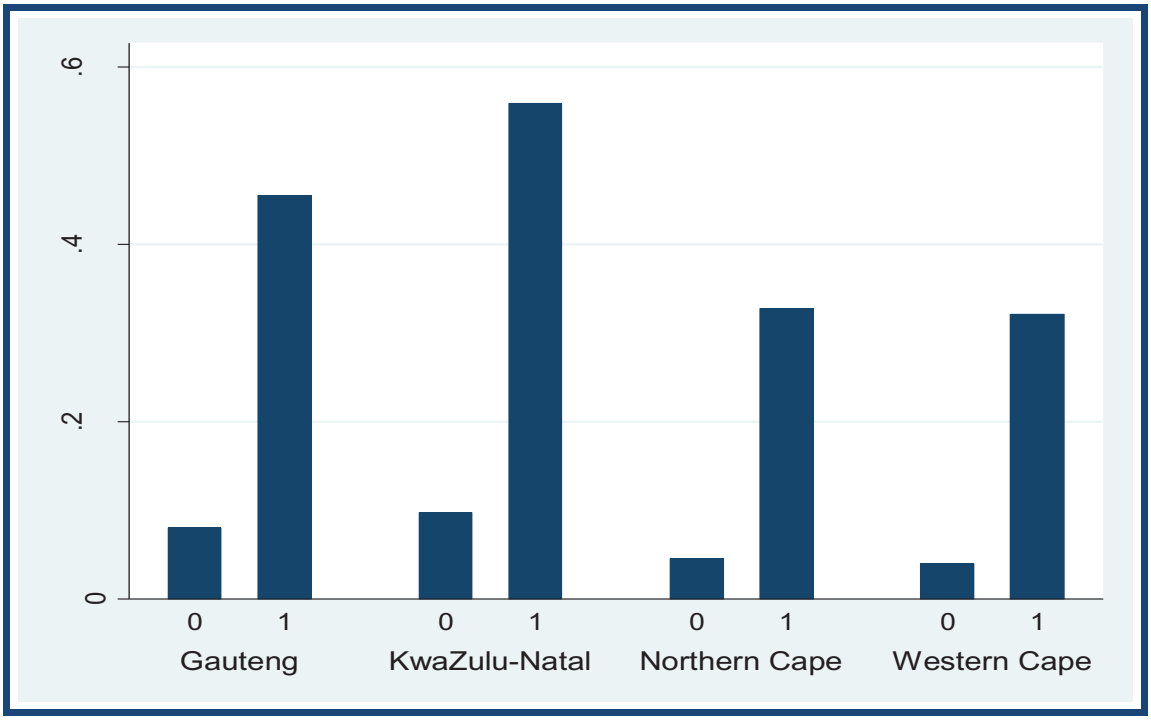



**Figure 56:** HIV prevalence by HSV- 2 status by province, (0 = negative; 1 = positive). (*Source*: NDoH, 2013)

Figure 57, a dots-plot shows HIV by age group according to the HSV- 2 status within each of the four provinces (vertical dotted line pooled estimate of HIV prevalence across the nine provinces: antenatal sentinel survey HIV prevalence of 29.5% in 2012). The non-linear age effect on HIV status is very evident in both HSV-2 positive and negatives but at completely different levels. For the HSV-2 positive women nearly all age groups have HIV prevalence rates that exceed the national ANC HIV 2012 estimate. The converse is true for the HSV-2 negative women. Thus, the level of HIV status according to the age group of the woman is mediated by woman's HSV- 2 status.

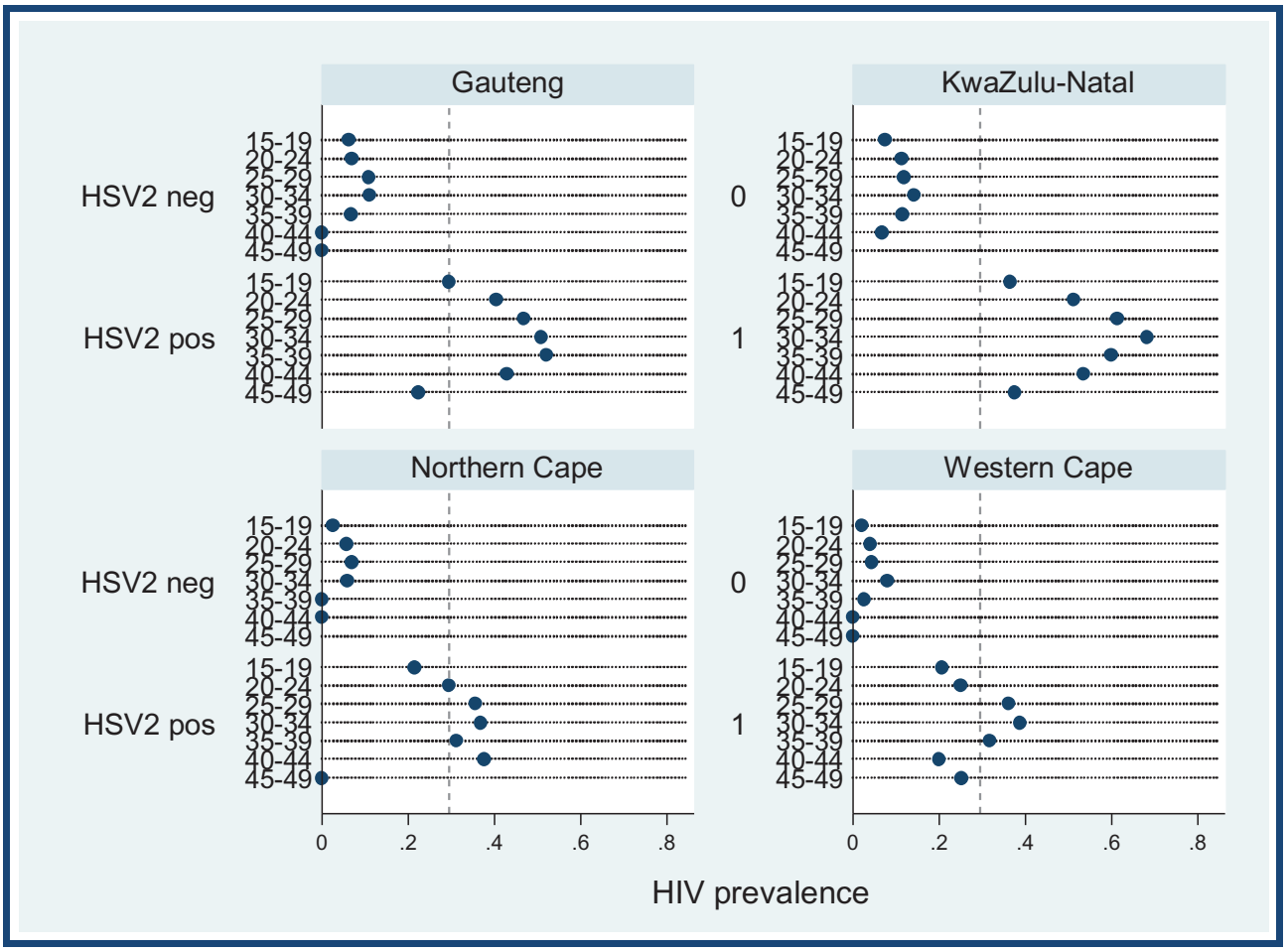



**Figure 57**: HIV Prevalence by HSV-2 status, by age and province. (*Source*: NDoH, 2013)

# CHAPTER 5

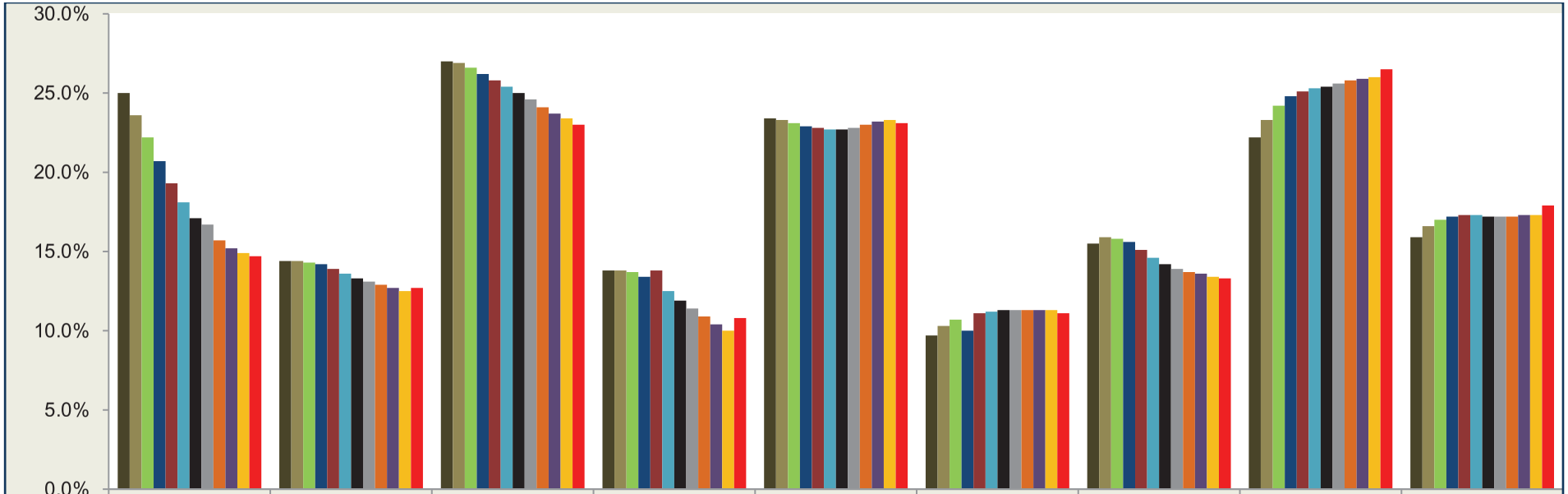
## 5. DISCUSSION AND CONCLUSION

South Africa remains the country with the highest number of people living with HIV as shown even among the SADC countries in Figure 58. The SADC countries carry 70% of the HIV burden in the world. In the past ten years between 2001 and 2012 most SADC countries strengthened their interventions to mitigate the impact of HIV epidemic. Figure 58 shows that the HIV prevalence in most SADC countries among 15 - 49 years old in the general population had decreased in countries like Zimbabwe, Botswana, Malawi, Zambia, and Namibia. Countries that show stabilization in HIV prevalence in the general populations are Angola, Democratic Republic of Congo, Madagascar, and Mauritius. The HIV prevalence in South Africa, Swaziland and Mozambique in the general population has increased in the past 10 years.

The generalized HIV epidemic trend in South Africa has been monitored through this national antenatal sentinel surveillance tool since 1990. It is through this epidemiological surveillance that we are able to monitor the characteristic of the HIV epidemic, where it has been shown that the national HIV prevalence estimate has been stable over the past 7 years.

**The key findings of the 2012 National antenatal sentinel HIV and HSV2 prevalence survey are as follows:**

1. The overall national HIV prevalence estimate among 15-49 years old pregnant women of 29.5% has not changed from the 2011 estimate.
2. Gauteng province has shows an increase from 28.7% in 2011 to 29.9% in 2012.
3. Five provinces namely: KwaZulu-Natal, Free State; Mpumalanga, North West and Gauteng have recorded HIV prevalence above the 29.5% national HIV prevalence estimate.
4. uMgungundlovu district in KwaZulu-Natal is back at the top recording an HIV prevalence of 40.7% followed closely by Gert Sibande District at 40.5% in Mpumalanga.
5. There is an increase in the number of districts that record HIV prevalence above the national average, from 23 out of 52 districts in 2010 to 27 out of 52 districts in 2012.
6. However, there is a decrease in the number of districts recording HIV prevalence above 40% from 5 districts in 2011, 3 in 2011 and now only 2 districts in 2012.
7. The HIV prevalence is declining in the younger women below 24 years; however, while here is a notable increase in HIV infections among the older women from 35 to 39 years of age.
8. The large numbers of young girls below 19 years and women above 40 years falling pregnant is of concern.




| | ZIM | ZAM | BOT | MAL | LES | MOZ | NAM | SWA | SA |
|---|---|---|---|---|---|---|---|---|---|
| 2001 | 25.00% | 14.40% | 27.00% | 13.80% | 23.40% | 9.70% | 15.50% | 22.20% | 15.90% |
| 2002 | 23.60% | 14.40% | 26.90% | 13.80% | 23.30% | 10.30% | 15.90% | 23.30% | 16.60% |
| 2003 | 22.20% | 14.30% | 26.60% | 13.70% | 23.10% | 10.70% | 15.80% | 24.20% | 17.00% |
| 2004 | 20.70% | 14.20% | 26.20% | 13.40% | 22.90% | 10.00% | 15.60% | 24.80% | 17.20% |
| 2005 | 19.30% | 13.90% | 25.80% | 13.80% | 22.80% | 11.10% | 15.10% | 25.10% | 17.30% |
| 2006 | 18.10% | 13.60% | 25.40% | 12.50% | 22.70% | 11.20% | 14.60% | 25.30% | 17.30% |
| 2007 | 17.10% | 13.30% | 25.00% | 11.90% | 22.70% | 11.30% | 14.20% | 25.40% | 17.20% |
| 2008 | 16.70% | 13.10% | 24.60% | 11.40% | 22.80% | 11.30% | 13.90% | 25.60% | 17.20% |
| 2009 | 15.70% | 12.90% | 24.10% | 10.90% | 23.00% | 11.30% | 13.70% | 25.80% | 17.20% |
| 2010 | 15.20% | 12.70% | 23.70% | 10.40% | 23.20% | 11.30% | 13.60% | 25.90% | 17.30% |
| 2011 | 14.90% | 12.50% | 23.40% | 10.00% | 23.30% | 11.30% | 13.40% | 26.00% | 17.30% |
| 2012 | 14.70% | 12.70% | 23.00% | 10.80% | 23.10% | 11.10% | 13.30% | 26.50% | 17.90% |

**Figure 58**: Comparison of HIV prevalence trends in the general population among SADC countries, 2001 to 2012.

ZIM = Zimbabwe; ZAM = Zambia; BOT = Botswana; MAL = Malawi; LES = Lesotho; MOZ = Mozambique; NAM = Namibia; SWA = Swaziland; SA = South Africa

Source: UNAIDS Global Reports

The Department has also used through this survey to monitored Syphilis prevalence trends since 1997. Syphilis prevalence trends were monitored in order to determine its role as a potential significant co-factor for HIV transmission. The empirical evidence from this survey has however over the years shown that there is an inverse relationship between HIV prevalence and Syphilis prevalence, hence it can be concluded that Syphilis is not a significant driver of the HIV epidemic. The syndromic management of Syphilis at primary care level has a significant impact in reducing STI infection rate and is highly effective in South Africa.

This inverse relationship between HIV prevalence and Syphilis prevalence has been further illustrated in the results of the 2010 survey where for example there was zero per cent (0.0%) or no syphilis infection in districts recording the highest HIV prevalence (%) in the country, i.e. Amajuba (35.9%), Ugu (41.1%); UMkhanyakude (41.9%); UMzinyathi (31.1%); uThukela (36.7 %), Zululand (39.8%), eThekwini (41.1%), iLembe (42.3%), uMgungundlovu (42.3%). However, the highest Syphilis prevalence was recorded in districts with the lowest HIV prevalence such as Central Karoo (8.5%), West Coast (10.0) and Namaqua (11.8%). Based on the previous year's (i.e. since 1997) syphilis prevalence trends findings, in 2012 the National Department of Health conducted a pilot survey to investigate whether there is association between HIV and HSV-2 in four provinces.

Evidence of clinical, epidemiological and biological studies have shown that HSV-2 is strongly associated with increased rates of HIV acquisition (Laitha and Abu-Raddad *et al*, 2008). While bacterial STIs tend to be concentrated in high risk groups (Shagafta, 2008), HSV-2 transmission is sustainable in the general population, and therefore its prevalence can reach very high levels (Corey, 2004) especially in countries with generalized HIV epidemics. The epidemiological overlap between HSV-2 and HIV is sustainably larger than that of any other bacterial STI with HIV. This is supported by the epidemiological data that indicates that globally HIV-1 and HSV-2 have overlapping prevalence patterns. According to Celum, 2004 both HIV and HSV-2 infections fuel one another by increasing transmissibility and susceptibility. It is assumed that infection with HSV-2 disrupts the genital mucosa and provides a portal of entry for HIV, leading to increased susceptibility of HIV in HIV-negative persons. Also, HSV-2 is thought to enhance HIV acquisition due to dense inflammatory infiltrates of CD4/CD8/dendrite cells in the genital tract associated with HSV-2 shedding (Zhu, 2009). Moreover, in HIV-positive persons, infection with HSV-2 accelerates replication and genital shedding of the virus, thus such individuals are more likely to transmit HIV (Yahya-Malima Khadijal *et al*, 2008).

This scientific evidence suggests that there is an epidemiological synergy between the two diseases at the population level. Thus, HSV-2 could have a major role in fuelling the spread of HIV and, if HSV-2 could either be prevented or suppressed, potentially significant numbers of HIV infections could be averted and HIV incidence can be reduced.

This report presents the first findings of determining the association between Herpes Simplex type-2 and HIV infection which was a pilot survey conducted in Gauteng, Western Cape, KwaZulu-Natal and Northern Cape provinces. The key findings show the following:

- HSV-2 prevalence was high in all four provinces *viz*: 58.4% in Gauteng; 46.3% in Western Cape; 60.2% in KwaZulu-Natal and 47.1% in the Northern Cape province;
- There is a significantly high prevalence of HSV-2 in the HIV positive, compared to HIV negative women, 89.1% vs. 42.5%;
- There is a significant association between increasing HSV-2 prevalence with increasing age of the women.
- The age trend in HIV is evident in both HSV-2 positive and negatives but at completely different levels. For HSV-2 positive women, nearly all age groups have HIV prevalence that exceeds the national 2012 estimate. The converse is true for HSV-2 negatives;
- Gauteng and KwaZulu- Natal have similar age profiles with respect to HSV-2 risk exposure factors;
- Northern Cape and Western Cape have similar age profiles with respect to HIV and HSV-2 risk exposure factors*;*
- HSV-2 is prevalent across all geographic areas (i.e. rural, peri urban and urban);
- Increasing age of partner was positively associated with increasing HSV-2 prevalence of the antenatal women;

The policy decision to pilot the association of HIV and Herpes simplex Type-2 has added significant evidence that show the role of other Sexually Transmitted Infections (STI's) that has not shown significant association between HIV and HSV-2. It will be important to roll-out the surveillance of HSV-2 in the remaining provinces i.e. Free State, Mpumalanga, Limpopo, Eastern Cape and North West province, this will inform what policy decision can be made to further strengthen HIV prevention strategies.

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## NOTES