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DREAMS

WORKING TOGETHER FOR
AN A.I.D.S-FREE FUTURE
FOR GIRLS & WOMEN

An evaluation of Adolescent Girls and Young Women's exposure to
HIV prevention programmes within the four DREAMS implementing
districts in South Africa: a cross sectional study

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DISCLOSURE

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the funding agencies.



CONTRIBUTING ORGANISATIONS



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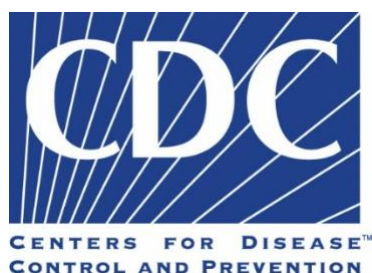
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LIST OF ACRONYMS AND ABBREVIATIONS

Acronyms/Abbreviations	Meaning
AGYW	Adolescent girls and young women
ART	Antiretroviral therapy
ARV	Antiretroviral drug
CAP	College of American pathologists
CDC	Centers for Disease Control and Prevention
CD4	Cluster of Differentiation 4
COJ	City of Johannesburg
CRSG	Community Research Support Groups
DREAMS	Determined, Resilient, Empowered, AIDS-free, Mentored, and Safe
EDTA	Ethylenediaminetetraacetic acid
ELISA	Enzyme-linked immunosorbent assay
Epicentre	Epicentre AIDS risk Management
FRR	False recent rate
GP	Gauteng Province
GPS	Global Positioning Systems
HCT	HIV Counselling and Testing
HEARD	Health Economics and HIV/AIDS Research Division
HIV	Human Immunodeficiency Virus
HIPSS	HIV Incidence Provincial Surveillance System
HPLC	High Performance Liquid Chromatography
HSP	Human subjects' protection
HSRC	Human Sciences Research Council
HSV-2	Herpes Simplex Virus type 2
IQR	Interquartile Range
IPV	Intimate Partner Violence
KZN	KwaZulu-Natal
LAg AI EIA	Limiting-Antigen Avidity Index Enzyme Immunoassay
MMC	Medical Male Circumcision
M-PCR	Multiplex Polymerase Chain Reaction
MSM	Men who have Sex with Men
MTB	Mycobacterium tuberculosis
NDoH	National Department of Health
NHLS	National Health Laboratory Service
NICD	National Institute for Communicable Diseases
NEQUAS	National External Quality Assessment Service
ODn	Normalized Optical Density
pNAAT	Pooled Nucleic Acid Amplification Test
PCR	Polymerase Chain Reaction
PDA	Personal Digital Assistant
PEP	Post-Exposure Prophylaxis
PEPFAR	President's Emergency Plan for AIDS Relief
PHC	Primary Health Care
PID	Participant Identification Number
PLHIV	People living with HIV

Acronyms/Abbreviations	Meaning
PMTCT	Prevention of Mother-To-Child Transmission
PrEP	Pre-Exposure Prophylaxis
Py	Person Years
QA/QC	Quality Assurance/Quality Control
RNA	Ribonucleic acid
SAL	Small Area Layer
SA	South Africa
SOP	Standard operating procedure
SAMRC	South African Medical Research Council
SACEMA	South African Centre for Epidemiological Modelling and Analysis
SANAS	South African National Accreditation System
SRH	Sexual Reproductive health
SST	Serum Separator Tubes
STI	Sexually Transmitted Infections
TB	Tuberculosis
UCT	University of Cape Town
USAID	United States Agency for International Development
UNAIDS	United Nations Joint Programme on HIV/AIDS
UTT	Universal Test and Treat
Viral load	HIV-1 RNA plasma viral load
VMMC	Voluntary Medical Male Circumcision
Wy	Women–years



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EXECUTIVE SUMMARY

Background

Young women in sub-Saharan Africa remain at the epicentre of the HIV epidemic, with data indicating persistently high levels of annual HIV incidence. In South Africa, adolescent girls and young women (AGYW) account for a quarter of all new HIV infections. Determined, Resilient, Empowered, AIDS-free, Mentored and Safe (DREAMS) is a programme strategy introduced by the US President's Emergency Plan for AIDS Relief (PEPFAR), aimed at reducing annual HIV incidence among AGYW in 10 countries in sub-Saharan Africa by 40% over two years. DREAMS interventions were aimed at mitigating factors such as poverty, gender inequality, gender-based violence (GBV), absence of parental and community support, and lack of sex education and vocational training^[1]. The purpose of the current AGYW **cross-sectional survey** was to assess annual HIV incidence and associated risk behaviours, using population-based surveillance data in selected DREAMS implementation districts in Gauteng and KwaZulu-Natal, South Africa hereon referred to as the AGYW study.

Objective:

The primary objective of the study was to determine HIV-1 incidence, prevalence, associated sexual risk behaviours and exposure to HIV prevention interventions using a household-based representative survey of AGYW aged 12–24 years in four districts where DREAMS was implemented.

Methods

Data were collected from a household-based representative sample of AGYW (in the age group 12–24 years) between March 13, 2017, and July 22, 2018 in four districts in which DREAMS had been implemented. A stratified cluster-based sampling approach was used to select eligible participants in the cross-sectional survey of individuals. A caregiver questionnaire obtained information on the socio-economic status of the household, including income, food security, and location (urban or rural); and proximity to national roads, clinics, and schools. Caregivers were asked to provide demographic information on the household and themselves including age, gender, marital status, employment, and educational status. The questionnaire also included information on HIV prevention activities undertaken by caregivers, HIV knowledge and misconceptions, and parenting measures including specific questions regarding the adolescent for whom they cared. The caregiver questionnaire also contained questions on the caregiver's exposure to HIV prevention interventions. No biological samples were collected from caregivers. The AGYW questionnaire administered contained questions on demographics, socioeconomic status, selected academic and developmental milestones, physical and mental health using the Centre for epidemiological studies' short form depression (CES-D5) scale^[2], sexual risk behaviour, physical intimate partner violence (IPV) and sexual IPV using the World Health Organization's sexual and physical violence behavioural measure^[3], and potential exposure to HIV prevention programme within the DREAMS implementing districts. Biological samples, including two micro-containers of blood, were collected and tested for HIV infection and HIV incidence. HIV incidence was calculated using the Limiting antigen Avidity Index Enzyme Immunoassay (Lag AI EIA). For HIV positive AGYW, their blood was tested for the existence of antiretroviral drugs and HIV viral load. Considering the sampling design and adjusting for non-response, population-weighted data were analysed using STATA survey procedures.

Results

Study response rates

A total of 18 296 AGYW and 6 487 caregivers from 13 254 households were enrolled in the study. A total of 10 384 AGYW were interviewed in Gauteng and 7 912 AGYW were interviewed in KZN. The median age for the AGYW who participated in this study was 19 (Interquartile range [IQR]: 15–21) years.



Household findings

The average household size was 5.1 members (median was 5). The median household size in Gauteng was 4 members (interquartile range [IQR]: 3–6) and in KZN it was 5 members (IQR: 4–7). The majority (60.9%) of household's respondents indicated receiving a formal salary or wage and just less than half (45.5%) indicated that grants were their primary source of income. In KZN, 51.5% of households' main source of income was government grant, while in Gauteng 41.4% of household's main source of income was government grant. More than half (54.1%) of the study's households earned between R1 001 and R5 000 per month and 19.1% earned less than R1 000 per month. In Gauteng, 19.9% earned less than R1 000 per month, and 18.1% in KZN earned less than R1 000 per month. In Gauteng, 51.3% of households earned between R1 001 and R5 000 per month, whereas in KZN, 58.0% of households fell within this income category. Nearly a quarter (24.2%) of households could be classified as food insecure. More than a quarter of households in Gauteng were food insecure (26.6%) and just more than one fifth of households in KZN were food insecure (20.9%).

Adolescent girls and young women 12–24 years findings

Sociodemographic characteristics

Among the enrolled AGYW, 18.9% were aged 12–14 years old, 36.8% were aged 15–19 years old and 44.3% were aged 20–24 years old. The age profile by province was relatively similar. Nearly two thirds (65.8%) of the total sample of AGYW spoke Zulu as their home language and 12.2% spoke Sotho as their home language. In KZN, the vast majority (96.8%) spoke Zulu and in Gauteng just less than half (49.7%) spoke Zulu, followed by Sotho (18.1%). The vast majority (97.6%) of the sample identified their race as African, with 96.6% identifying as African in Gauteng and 99.5% identifying as African in KZN. Nearly all (98.8%) of the enrolled AGYW were South African citizens. Nearly a fifth (17.0%) of AGYW's biological mothers were no longer living; 15.5% in Gauteng and 19.8% in KZN. About a third (29.4%) of AGYW's biological fathers were no longer living; 27.4% in Gauteng and 19.8% in KZN. Nearly half (49.4%) of all AGYW reported currently dating someone although they were not cohabiting and 45.3% of AGYW were not in a relationship. Just less than half (48.3%) of AGYW in Gauteng were both dating someone but not cohabiting and just over half (51.3%) of AGYW in KZN were dating someone but not cohabiting.

Employment status of AGYW

Just over one tenth (13.5.8%) of AGYW of 12–24 years were employed on a full-time or part-time basis. Younger girls (15–19 years old) were less likely to be employed than girls aged 20–24 years old in Gauteng (4.1% vs. 13.3%, respectively) and KZN (3.7% vs. 14.0%, respectively).

Current school attendance

More than half of AGYW in Gauteng (56.9%) and KZN (59.0%) reported being enrolled in school. The school attendance rates were very high for young adolescents 12–14 years old in Gauteng (97.6%) and KZN (97.5%). Approximately three quarters of 15–19-year-old adolescent girls in Gauteng (76.4%) and KZN (77.0%) were enrolled in schools. Approximately one quarter of 20–24-year olds were still in school, in Gauteng (24.5%) and KZN (25.3%).

Sexual behaviour and condom use of AGYW

Nearly half (49.9%) of AGYW had ever had sex. Of those who had ever had sex and were 15 and above, approximately one-fifth (15.9%) had engaged in sexual activity by age 15 years. About a third (32.3%) of all AGYW reported they had a partner in the previous 12 months who was five or more years older (age-disparate partnership). In Gauteng, slightly more than a third (34.5%) of AGYW had an age-disparate partner in the previous 12 months. In KZN more than a quarter (27.8%) had an age-disparate partner in the previous 12 months. Just under half of the sexually active AGYW (48%) reported that they had used a condom during their last sexual encounter; 49.9% in Gauteng and 44.5% in KZN.



Resilience and wellbeing

Overall depression symptoms appear to be quite low with a mean of 1.2 (Range: 0–15). Depressive symptoms appear to be slightly more prevalent in Gauteng than in KZN (Mean= 1.3 vs. 0.8, $p < 0.001$, respectively).

Intimate Partner Violence

Just over one in ten (13.0%) of AGYW in a relationship reported experiencing Physical Intimate Partner Violence (IPV) in the previous year with 14.1% in Gauteng and 10.9% in KZN. Approximately five percent (4.5%) of AGYW had reported experiencing Sexual IPV in the previous year; 5.4% in Gauteng and 2.7% in KZN. Physical and Sexual IPV increased with age: 6.8% of AGYW 12–14 years old experiencing violence, 12.6% of 15–19-year-old AGYW experienced violence, and 15% of AGYW 20–24 years old experiencing some form of sexual or physical IPV.

Non-Partner Sexual Violence

Overall, 4.6% of all AGYW reported experiencing sexual violence in the previous 12 months from someone who was not their partner. In Gauteng, 5.3% reported experiencing sexual violence in the previous 12 months from someone who was not their partner, while in KZN 3.1% reported experiencing sexual violence in the past 12 months from someone who was not their partner. Young adolescents (12–14 years old) were less likely to report experiencing sexual violence from someone who was not their partner than young women (20–24 years old) in Gauteng (1.7% vs. 6.7%, respectively) and KZN (1.3% vs. 4.5%, respectively).

HIV

Overall, annual HIV incidence among AGYW in the study sample was 0.72% (95% confidence interval [CI]: 0.65–0.79%). Annual HIV incidence in Gauteng and KZN was very similar (Gauteng: 0.72% [95% CI: 0.65–0.80%] and KZN: 0.71% [95% CI: 0.65–0.79%]). Annual HIV incidence for AGYW 15–24 years old was 0.87% (95% CI: 0.79–0.96%). Annual HIV incidence was higher for young women aged 20–24 years old at 1.07% (95% CI: 0.97–1.18%), compared with 0.65% (95% CI: 0.59–0.72%) for adolescent girls aged 15–19 years old.

HIV prevalence was 10.3% overall, with KZN higher at 15% (95% CI: 14.2–16.1%) compared to Gauteng which was 7.8% (95% CI: 7.2–8.5%). HIV prevalence was highest for young women 20–24 years in KZN (23.9%) and lowest among girls of 12–14 years old in Gauteng (2.5%). With regards to the Joint United Nations Programme on HIV/AIDS, 90–90–90 target, the results from the first 90, show that just more than half (55.5%) of the HIV-positive AGYW in Gauteng and 67.3% of the AGYW in KZN knew their HIV status. For the second 90, most AGYW who knew their HIV positive status tested positive for ARVs in Gauteng (84.4%) and KZN (89.5%). The highest coverage of Antiretroviral Therapy (ART) among HIV positive individuals who knew their status was found among 12–14-year-old adolescent girls in KZN (96.6%). The lowest coverage of ART among HIV-positive individuals who knew their status was found among 20–24-year-old young women in Gauteng (82.4%). Most (90%) of AGYW who tested positive for ARVs were virally suppressed.

HIV prevention interventions exposure

The HIV prevention intervention with the greatest coverage among AGYW was sexuality education (59.6% of AGYW reported exposure and knowledge of the programme). Nearly half (48.1%) of all AGYW had been exposed and participated in the HIV testing campaigns and 44.5% had received training or education on the use of condoms. Very few AGYW (10.8%) had used pre-exposure prophylaxis (PrEP) ($n=160$).

Caregiver findings

Sociodemographic characteristics

Caregivers of AGYW under 18 years of age were included in the study. The median age of caregivers was 41 years old (IQR: 34–51) and the caregivers were overwhelmingly female (95.6%). Nearly two-thirds (65.1%) of the caregivers that were interviewed were the mothers of AGYW and 13.1% were the maternal grandparents of AGYW, 9.2% were aunts, 3.1% fathers, 1.1% cousins, 0.9% uncles, and 4.4% other relations.



HIV testing coverage and HIV testing

Approximately two thirds (66.4%) of caregivers had tested for HIV. One fifth (15.9%) of caregivers self-reported testing HIV positive. Thirteen percent of the caregivers in Gauteng indicated that they were HIV-positive and 19.5% of the caregivers in KZN indicated that they were HIV-positive.

Caregiver exposure to HIV prevention interventions

Exposure to HIV prevention interventions among caregivers was very low. However, the DREAMS programme partners target numbers to be reached for caregivers were also very low. The programme with the highest exposure (21.2%) was HIV testing campaigns.

Strengths of the study

The survey methodology ensured representativeness of AGYW in the DREAMS targeted areas. The large sample size allowed for meaningful analyses of data, and enabled generalizability and a good understanding of the HIV epidemic in these areas. Participation rates were high and bias in the sample was limited, as a random sampling approach was employed which ensured representativeness of the sample and hence there was no systematic exclusion of participants in the sample. The use of laboratory tests provided rigorous and precise measurements of HIV incidence, HIV prevalence, and ART use among AGYW in this sample. The sample also included 12–14-year olds, which is quite rare as most studies use a cut off age of 15 years old or older.

Limitations of the study

Fieldwork for the study started after implementation of the intervention, and did not capture whether the AGYW were enrolled in DREAMS interventions. More research is required to understand how to measure exposure to a complex HIV prevention programme. The study was based on the assumption that the annual HIV incidence and prevalence rates were higher than what were found in this study. Therefore, careful consideration will need to be given to the sample size required in the second wave to ensure it is powered to detect the change in annual HIV incidence required to measure impact. Data on intervention exposure, sexual behaviours, number of sexual partners and other sensitive issues were self-reported and are thus subject to potential recall bias and social desirability bias.

Conclusion

The AGYW study's annual HIV incidence was lower than the results of previous studies among young women in a similar geographic region conducted two years earlier. The HIV prevalence varied by geographic region with the KZN sample having significantly higher HIV prevalence compared to the Gauteng sample. The performance on the UNAIDS first 90 (proportion of those infected who know they are infected) was insufficient to meet the targets with less than two-thirds of AGYW reporting knowledge of their HIV status. However, the data indicates that the second and third 90 targets are almost achieved by respondents in this study. Condom use in this population of AGYW was suboptimal, despite nearly half of all individuals having attended condom training. The findings highlight the importance of scaling up HIV prevention technologies, as the number of AGYW infected with HIV is still very high even as annual HIV incidence may be declining, as indicated in our results and other studies from KZN.

The study identified a greater need for condom promotion, improved HIV Counselling and Testing (HCT) and linkages to care to obtain viral suppression, improved knowledge on pre-exposure prophylaxis (PrEP), expanded GBV prevention as well as post-violence care and support, and linkage to sexual reproductive health (SRH) services. Expanding programs that offer HIV prevention interventions for AGYW and caregivers in these areas may provide an opportunity to improve health outcomes.

1 INTRODUCTION

1.1 Background

Adolescent girls and young women (AGYW) in sub-Saharan Africa are highly susceptible to contracting HIV^[4]. In 2017, AGYW accounted for 74% of new HIV infections in sub-Saharan Africa^[5,6], with South Africa (SA) having an estimated 540 000 AGYW (15–24 years) living with HIV in 2018^[7]. The HIV prevalence is currently 5.8% among female adolescents aged 15–19 years old and 15.6% among young women aged 20–24 years old^[8]. The highest annual HIV incidence is among South African AGYW (1.5%) as compared to young men (0.5%) in 15–24-year-olds. This translates into approximately 66 000 new infections among AGYW in 2018^[9]. It was estimated that in 2018 there were 3 900 HIV-related deaths among AGYW 15–24 years old^[10].

Several factors contribute to the high rates of HIV acquisition among AGYW. Young women are biologically more susceptible to acquiring HIV, due to cervical ectopy, which is particularly pronounced in younger women^[11]. In addition, the high prevalence of sexually transmitted infections (STIs) and the greater ease of transmission from men to women may increase HIV acquisition^[12]. In South Africa, previous studies have found that the prevalence of STIs was higher among women younger than 25 years of age than in their older counterparts^[13,14,15]. The prevalence of STIs in a rural KwaZulu-Natal setting among females aged 15–24 years old was 20.6% for *Chlamydia trachomatis*, 8.9% for *Neisseria gonorrhoeae*, 20.0% for *Trichomonas vaginalis*, 53.7% for *Herpes simplex 2*, and 52.4% for bacterial vaginosis^[16].

Social, behavioural and structural factors further facilitate HIV transmission among AGYW^[17,18,19]. Adolescence and young adulthood are often associated with impulsive and high risk-taking behaviours which are sometimes related to perceived invulnerability^[20]. Poor mental health is associated with risk-taking behaviours (substance use, binge drinking, and sexual violence)^[21]. High risk drinkers and recreational drug users were more likely to use condoms inconsistently in South Africa as evidenced in a recent national survey^[6].

Many AGYW enter sexual relationships with older partners as a result of patriarchal norms, socioeconomic deprivation, peer pressure, and demand for material resources^[22]. Age-disparate relationships increase AGYW's susceptibility to HIV acquisition^[23,24,25,26] as older men are more likely to be HIV positive and not know their status^[27,28], and because age-disparate partnerships are characterized by inconsistent condom use^[29,30,31] and concurrent sexual partnering^[32]. Age-disparate partnerships are more likely to be transactional in nature^[33], which increases the likelihood of contracting HIV^[34]. Furthermore, AGYW are susceptible to intimate partner violence, that may increase their risk for acquiring HIV^[35].

The Determined, Resilient, Empowered, AIDS-free, Mentored and Safe (DREAMS) initiative was introduced by the United States President's Emergency Plan for AIDS Relief (PEPFAR) in 2014 with the aim of curbing the high HIV incidence among AGYW. The DREAMS initiatives were undertaken in 10 countries in sub-Saharan Africa: Kenya, Lesotho, Malawi, Mozambique, South Africa, Swaziland, Tanzania, Uganda, Zambia, and Zimbabwe. The initiative entailed evidence-based interventions, aimed at addressing the structural and behavioural drivers that increase AGYW risk of acquiring HIV. Interventions were aimed at mitigating factors such as poverty, gender inequality, gender-based violence (GBV), absence of parental and community support, and lack of sex education and vocational training^[36]. The DREAMS initiative sought to reduce annual HIV incidence by 40% among AGYW over a two-year period^[37].

In South Africa, DREAMS interventions were rolled out in the provinces of KwaZulu-Natal and Gauteng. Five high-HIV-burden districts were selected within these provinces, namely: City of Johannesburg (COJ), Ekurhuleni, eThekweni, uMgungundlovu and uMkhanyakude. DREAMS was not uniformly rolled out across these districts. The DREAMS-implementing partners identified the most at-risk populations and these areas were targeted for implementation. The purpose of the current AGYW **cross-sectional survey** was to assess annual HIV

incidence and associated risk behaviours, using population-based surveillance data in selected DREAMS districts in Gauteng and KwaZulu-Natal, South Africa, hereinafter referred to as the AGYW study

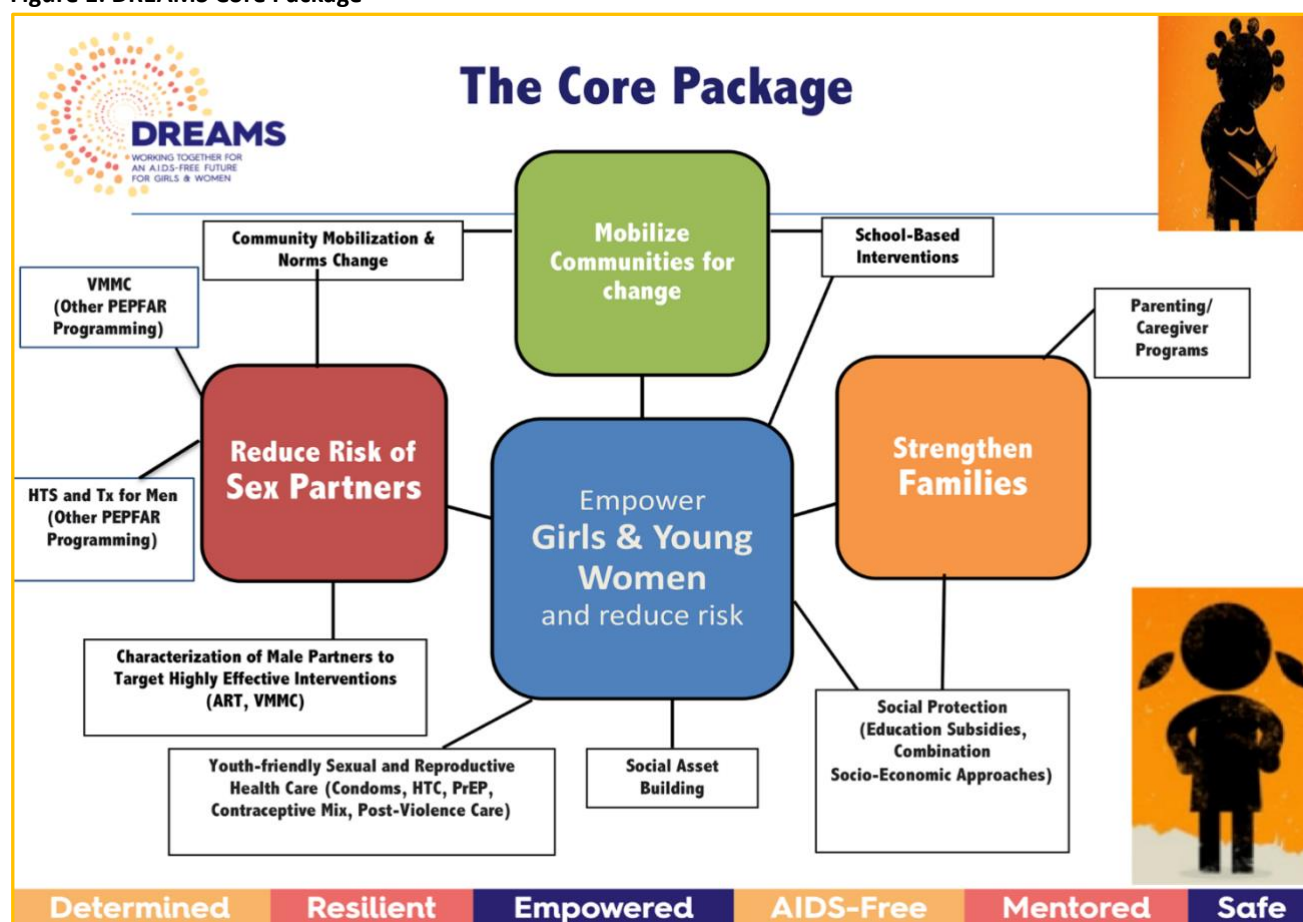
The AGYW study was implemented in the areas targeted by the implementing partners. The DREAMS initiative was executed through existing US government funded programme implementers, including community, faith-based, non-governmental organizations, and the South African government. The core package included activities to empower AGYW to control their sexual health, mobilize communities to prevent HIV and violence and to change norms, economically strengthen the families of AGYW and improve the ability of families to positively and effectively support AGYW, and reduce the HIV risk of men who are likely to be the sex partners of the AGYW. The DREAMS interventions included condom promotion and provision, HIV Counselling and Testing (HCT) and linkages to care, pre-exposure prophylaxis (PrEP), GBV prevention as well as post-violence care and support, linkage to sexual reproductive health (SRH) services, comprehensive sexuality education, and social asset building. DREAMS interventions aim to strengthen school-based HIV and GBV prevention efforts, social protection initiatives and interventions specifically targeting male sex partners (see Figure 1 for the DREAMS programme in South Africa). The DREAMS programme targeted AGYW aged 10–24 years old. The package is tailored to both age category and risk profile (i.e. not even all AGYW in the same group would receive the same services).

The DREAMS programme aimed at reducing HIV transmission is based on a combination HIV prevention approach which includes a combination of behavioural, biological and structural interventions. In practice this means that the DREAMS programme aims to address the risk that AGYW experience through a layering of evidence-based interventions. PEPFAR defines layering as providing multiple interventions or services at the individual level, but also providing contextual level interventions that are not directly delivered to an AGYW but these interventions may still benefit the AGYW. Layering seeks to address the multiple overlapping risk to HIV.

While some of the interventions target younger girls, and boys and men, this study focused on young women between 12–24 years of age. The study assessed whether AGYW and their caregivers have participated in HIV prevention interventions in four of the five districts where DREAMS and HIV prevention interventions were implemented, with correlates of annual HIV incidence and sexual risk behaviours.



Figure 1: DREAMS Core Package ³⁸



Notes: VMMC = voluntary medical male circumcision, ART = Antiretroviral treatment, PEPFAR = President's Emergency Plan for AIDS Relief, HTS= HIV testing services, Tx = Treatment. The Thuthuzela care centres, SASA! Activist kits, Vhutshilo 1 and 2, Family matters programme, teens and adults learning to communicate project, B-wise mobile app, Stepping stones, Skillz street, ASPIRES economic strengthening, and Sexuality education in Life orientation programmes are also part of the core package and were implemented among caregivers.

1.2 Objectives of the study

The primary objective of the study was to determine HIV-1 incidence using a household-based representative survey of AGYW aged 12–24 years in two districts in KZN and two districts in Gauteng where the DREAMS programme was being implemented. The secondary objectives of the study were to: 1) measure the HIV prevalence and proportion of HIV-positive AGYW on ART and ART-naïve with detectable and undetectable HIV-1 Ribonucleic Acid (RNA) viral load; 2) measure prevalence of pregnancies, sexually transmitted infections, and access to contraceptives; 3) measure risky sexual behaviour and prevalence of intimate partner and non-partner violence; and 4) present data on HIV prevention interventions and outcomes.

2 METHODS

2.1 Survey design

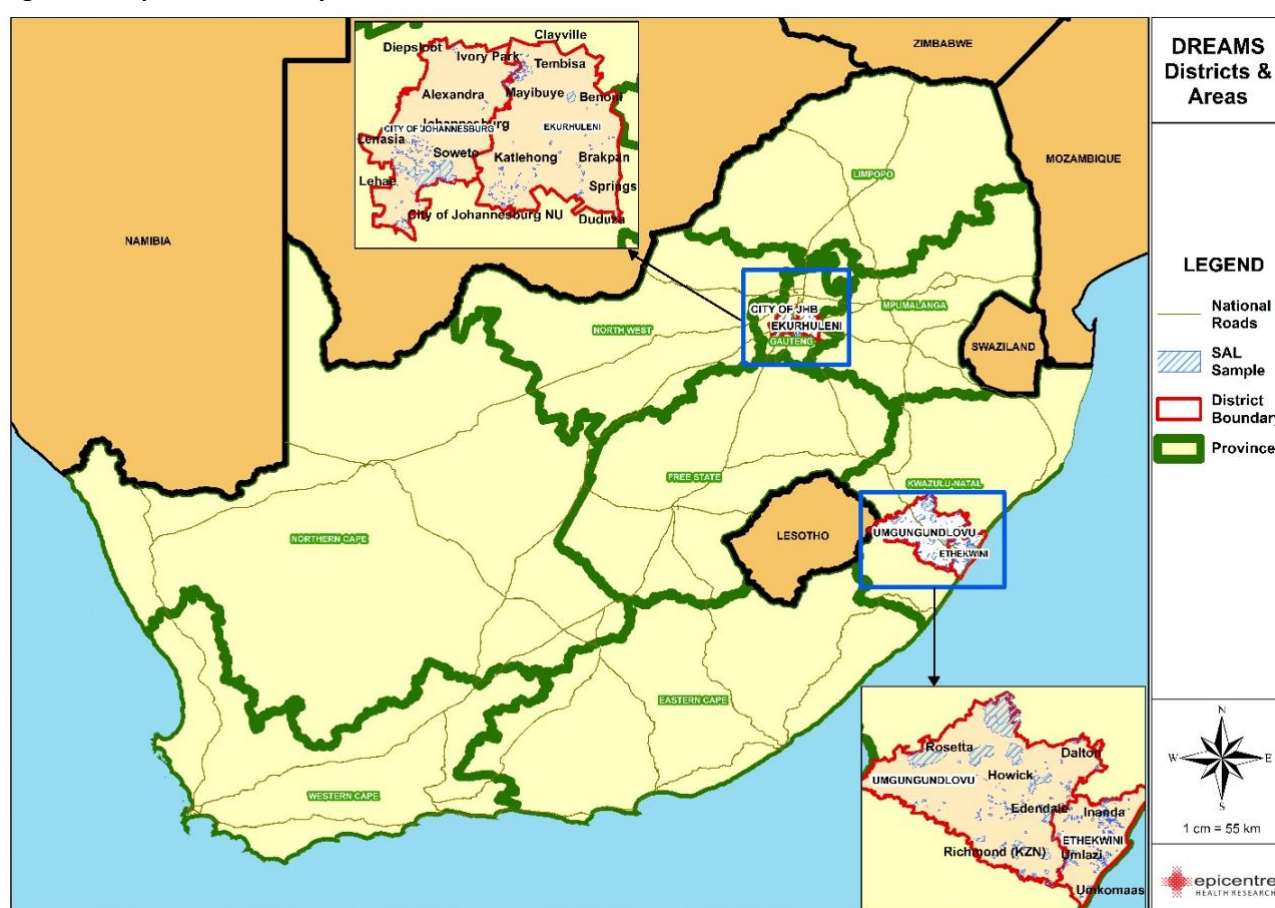
The AGYW study was a cross-sectional study targeting 18 500 AGYW, in four selected districts in South Africa. The study sampling method was a multistage cluster random design. The study enrolled participants at households.

2.2 SURVEY SITE AND SOURCE POPULATION

2.2.1 Study sites districts

The study took place in the Districts of Ekurhuleni and COJ in the Gauteng province and the Districts of uMgungundlovu and eThekweni in the province of KZN. The four study districts consist of an estimated 12 073 421 individuals.

Figure 2: Map of AGYW study districts 2018



2.2.1.1. KwaZulu-Natal Province

The province of KZN remains the worst affected by HIV with an overall prevalence of 27% among 15–49-year-old inhabitants in 2018^[39]. The two districts of interest within KZN, uMgungundlovu (20% HIV prevalence in 2016) and eThekweni (16.7% HIV prevalence in 2017) are among those with the highest HIV prevalence in South Africa^[40]. The eThekweni District is home to the busiest port on the African continent and the main economic hub within the province of KZN^[41]. Just over two-thirds (68%) of eThekweni is considered rural and 32% is urban. uMgungundlovu District is the second largest district in KZN after eThekweni and is situated in central KZN. uMgungundlovu includes traditional settlements or farmlands, informal, rural and urban

settlements. Its local municipalities are largely rural, while the Msunduzi Municipality is industrialized. The largest city within the uMgungundlovu District is Pietermaritzburg, which is also the capital of KZN.

2.2.1.2. Gauteng Province

The Gauteng Province (GP), while geographically the smallest, is the most populous province in South Africa. GP has the fifth highest provincial HIV prevalence in the country with a prevalence of 17.6% among those aged 15 to 49 years old in 2017^[42]. The HIV prevalence in the two study districts, City of Johannesburg and Ekurhuleni, is 12.9% and 15.0% (2017 prevalence figures) among 15–49-year-olds, respectively^[43]. Both districts are densely populated and have high levels of industrialisation.

2.2.2 Study population

The study population was AGYW ages 10–24 and their caregivers, who may or may not have participated in DREAMS, living in the four AGYW study districts that consisted of an estimated 3 679 700 households containing approximately 1 633 906 AGYW^[44]. Additional characteristics of the population within the selected districts are listed in Table 1.

Table 1: Study population in four DREAMS implementation districts 2011–2017

Characteristics of the population within South Africa DREAMS implementation districts (2011–2017)	eThekweni	uMgungundlovu	City of Johannesburg	Ekurhuleni
Population size: 10–24 years AGYW [†]	500 214	153 722	584 104	395 866
Population density per square km [†]	1 501.9	113.9	2 695.9	1 652.0
HIV ANC Prevalence (%) [#]	41.1%	42.5%	27.5%	33.5%
People living with HIV (PLHIV) [§]	516 167	225 284	533 960	468 521
Number of AGYW 10–19 years receiving grants [*]	64 716	84 942	189 845	155 135
Number of orphans [^]	86 734	42 000	61 634	55 261
Number of girls in schools Ages 10–20 years ^{&}	238 544	74 602	276 185	161 182
Teenage pregnancy (deliveries at facility in women under 18 years and not terminations) (%) [§]	7.0%	8.5%	3.6%	6.2%
Number of households [†]	956 713	272 666	1 434 856	1 015 465


Notes:

[†] Stats SA population estimated 2016; [#] South African Department of Health. The 2012 National Antenatal Sentinel HIV Prevalence Survey in South Africa. Pretoria: Department of Health; 2015; [§] Shisana O, Rehle T, Simbayi LC, Zuma K, Jooste S, Zungu N, Labadarios D, Onoya D: South African national HIV prevalence, incidence and behaviour survey, 2012. In Cape Town: HSRC; 2014; ^{*} In this context, a grant refers to the social assistance provided by the South African Social Security Agency in the form of different grants for children (for example Foster Child Grant, Care Dependency Grant, Child Support grant and Grant-in-aid). Peltzer K, Ramlagan S, Chirinda W, Mlambo G, Mchunu G. A community-based study to examine the effect of a youth HIV prevention programme in South Africa. *Int J STD AIDS*. 2012; 23(9): 653–8. [^] HELLERINGER S, KOHLER HP, CHIMBIRI A, CHATONDA P, MKANDAWIRE J. The Likoma Network Study: Context, data collection, and initial results. *Demogr Res*. 2009; 21: 427–68. & CAMPBELL MS, MULLINS JL, HUGHES JP, CELUM C, WONG KG, RAUGI DN, SORESENSEN S, STODDARD JN, ZHAO H, DENG W, KAHLE E, PANTELEEFF D, BAETEN JM, MCCUTCHAN FE, ALBERT J, LEITNER T, WALD A, COREY L, LINGAPPA JR. Partners in Prevention H. S. V. H. I. V. Transmission Study Team. Viral linkage in HIV-1 seroconverters and their partners in an HIV-1 prevention clinical trial. *PLoS ONE*. 2011; 6(3): e16986. [§] Center for Health and Gender Equity: The U.S. Dreams Partnership: Breaking Barriers to HIV Prevention for Adolescent Girls and Young Women: A Field Report on Sexual and Reproductive Health and Rights in the U.S. Dreams Partnership in South Africa and Kenya.

http://www.genderhealth.org/files/uploads/change/publications/CHANGE_Dreams_Report_Updated.pdf: Accessed 02 Feb 2018.

2.2.3 Sample size calculation

Sample sizes were calculated separately for each province using the South African Centre for Epidemiological Modelling and Analysis (SACEMA) incidence sample size calculator for comparing incidence from two sequential cross-sectional surveys^[45]. We arrived at our assumptions for prevalence and incidence using data from the 2013 South African Antenatal HIV Prevalence Survey and the HIV Incidence Provincial Surveillance



System (HIPSS) study in uMgungundlovu, baseline findings 2014. The following inputs were used for KZN: 80% power to detect a reduction of 40% in the annual HIV incidence rate at 5% significance level given a false recent rate (FRR) of 0.01%, assuming HIV prevalence of 25%, and an initial HIV incidence rate of 4 per 100 person years (py)^[46]. For Gauteng, the following inputs were used: 80% power to detect a 40% reduction in annual HIV incidence given an FRR of 0.01%, HIV prevalence of 25% and baseline incidence of 3 per 100 py among AGYW aged between 12–24 years. The calculation indicated that a sample of 8 500 AGYW was required for KZN and 10 000 for Gauteng.

2.3 Sampling procedure

A stratified cluster-based sampling design was used. The four districts were considered as the primary strata. The sample size per district was designed to be proportional to the AGYW in DREAMS sub-district areas. The PEPFAR partners provided guidance on where the DREAMS interventions were being implemented. These areas were then mapped onto the available census small areas layer (SAL) sampling areas that covered the targeted areas. Only SALs that DREAMS was going to be implemented in were included in the sampling frame.

A sampling frame was compiled for each district based on the 2011 census SALs. The SAL sampling frames were cross-checked with other sources and mapped with aerial photography to make sure that they were accurate and up to date. The sampling frame was further adjusted to the latest Geo Terra Image counts, other district council estimates, and Stats SA's most current midyear estimates of population numbers per province^[47], according to the province boundaries, race, five-year age groups and gender. For each SAL, information was available about the number of households, and number of individuals by gender, population group and age.

The sampling calculation found that 1 050 SALs would be required to achieve a sample of 18 500 AGYW 12–24 years. This was based on the assumption that 55 households were systematically randomly selected per SAL, and 1 in 2 households had an eligible AGYW 12–24 years, with a non-response rate of $\leq 20\%$. These calculations meant that ≥ 18 AGYW would be recruited per SAL.

A total of 1 050 SALs were randomly selected, 450 SALs in KZN and 600 in Gauteng. In Gauteng, the COJ and Ekurhuleni have similar population sizes; therefore, half the SALs were allocated to each sub-district. In KZN, the SAL were allocated based on a ratio of 1:3 between uMgungundlovu and eThekweni. uMgungundlovu is approximately one-third the size of eThekweni.

2.4 Participation inclusion and exclusion criteria for the survey

2.4.1 Inclusion criteria

All young women aged 12–24 years residing in the sampled households who were willing to participate in the study, willing to provide written informed consent, undergo the study procedures, and provide biological samples, were included in the study. For participants younger than 18 years, caregiver consent was provided with child assent. AGYW were not required to have participated in DREAMS activities to participate in the survey.

2.4.2 Exclusion criteria

Respondents who did not speak one of English, Zulu, Sotho, or Afrikaans were excluded. Respondents who had cognitive or mental challenges (based on the assessment of the participant's ability to comprehend the study information provided) and those who were deaf and/or mute were excluded from the study. Furthermore, individuals in institutions (hostels, prisons, and hospitals) were not eligible for participation in the study.

2.5 Measurement instruments

The caregiver and individual consent forms were completed electronically, and an information form and paper-based copy of the consent form were given to the participants. The information sheet provided participants with details on the objectives of the study, the number of biological tests to be undertaken, where to find the results from the tests, and who to contact should the participant require additional information on the study. All questionnaires were captured electronically into Mobenzi researcher software® on Samsung tablets^[48]. The tablets recorded the GPS location of the household where the questionnaires were administered. All questionnaire data were transmitted to a server on completion via mobile data and deleted from the tablet.

2.5.1 Household composition questionnaire

Sampled households were visited by a listing team who introduced the study and completed an electronic household composition questionnaire to list household members. They recorded 1) address and directions; 2) number of AGYW per caregiver; 3) contact details; 4) GPS coordinates. Households which did not have an eligible adolescent girl or young woman were excluded from the study.

2.5.2 Caregiver questionnaire

The caregiver was defined as a parent or guardian who is primarily responsible for the AGYW's welfare, specifically the person who prepares meals, seeks medical attention for the AGYW in the case of illness and otherwise cares for the AGYW, and someone who was capable of providing consent for the AGYW's participation in the study. If the AGYW was younger than 18 years old, then the caregiver completed the caregiver questionnaire.

An information sheet was provided to caregivers apprising them of the study. The information sheet highlighted the rationale for the study, gave information on study design, assured participants on the confidentiality of their data, highlighted the tests that the AGYW would be asked to undertake and the participants' rights in the study, and provided the ethical committee's and principal investigator's contact numbers.

A caregiver questionnaire obtained information on:

- Socio-economic status of the household, including income, food security, and location (urban or rural), in addition to proximity to national roads, clinics and schools;
- Demographic information including age, gender, marital status, employment, and educational status of all household members;
- Self-evaluated physical health based on the Washington Group short set of questions measuring disability^[49];
- Self-evaluated psychological health using the Center for Epidemiological Studies short form depression (CES-D5) scale^[50]. Values on the scale range from 0–15 with a higher score indicating a greater number and frequency of depression symptoms; and
- Knowledge and sources of information on HIV prevention, which consisted of five items assessing respondents' knowledge on how HIV is transmitted; adapted parenting measures, which included the caregiver's communication with AGYW about their sexual activity, caregiver's parenting practices and caregiver's interaction with the adolescent's schooling; and items on perceptions of AGYW's behaviour in the household and outside the household, based on the Alabama Parenting Questionnaire^[51].

No biological samples were collected from caregivers. No caregiver questionnaire was administered in situations where the AGYW study participant was over 18 years of age. In the latter case, the socio-economic household questions were added to the individual AGYW questionnaire.

2.5.3 Adolescent girl and young women questionnaire

No personal identifiers were documented, and each study participant was assigned a unique study number. The unique number was linked to all questionnaires and biological samples. The questionnaire included the following measures:

- Demographic information including age, gender and marital status;
- Employment status;
- Academic milestones of study participants, including whether AGYW had repeated a grade at school, whether they were still currently in school and the highest level of education AGYW had achieved;
- HIV knowledge measures which consisted of five items assessing respondent's knowledge on how HIV is transmitted;
- AGYW perceived risk of contracting HIV was assessed, which was one item and a higher value on this measure indicates a lower perceived risk of contracting HIV. Values range from 0–3;
- Self-efficacy to use condom scale (self-constructed scale), it which consisted of items assessing individual's confidence in their ability to use condoms, gain access to condoms and negotiate condom use with sexual partners. Response options (very unsure to very sure) were scored from 0–3 for each item and summed for the three items in the scale. Values range from 0–9 and a higher score is indicative of greater self-efficacy to use a condom;
- Psychological health using the Centre for epidemiological studies short form depression (CES-D5) scale^[52]. Response options (rarely–all of the time) were scored from 0–3 for each item and summed for the 5 items in the scale. Values on the scale range from 0–15 with a higher score indicating a greater number and frequency of depression symptoms;
- Alcohol Use Disorders Identification Test version C (AUDIT-C)^[53]. Response options were scored from 0–4 for each item and summed for the 3 items in the scale. Values on the scale range from 0–12. A higher value indicates a greater use of alcohol;
- Drug use index (self-constructed to align to the South African context) which asks respondents if they have used marijuana, inhalants, sedatives, hallucinogens or cocaine in the previous 12 months. Response options (never–daily) were scored from 0–4 for each item and summed for the 5 items in the scale. Values range from 0–20 with a high score indicating greater drug use;
- The Child and Youth Resilience Measure 12 item version^[54]. Response options (not at all–a lot) were scored from 1–5 for each item and summed for the 12 items in the scale. Values on this scale range from 12–60. A high value means greater resilience;
- The Sexual Relationship Power Scale measures subjective experiences of being controlled in an intimate partnership^[55]. Power in the relationship is defined as male decision-making dominance, the ability to engage in behaviours against their male partner's wishes or the ability to control their male partners actions^[56]. Response options (strongly agree–strongly disagree) were scored from 0–3 for each item and summed for the 5 items in the scale. Values ranged from 0–15. A higher score indicates greater freedom in the relationship;
- The World Health Organization's Intimate Partner Violence behavioural measure which has been adapted for a South African context^[57]. Sexual IPV includes being raped, forced or persuaded to have sex with an intimate partner and physical IPV includes physically violent practices (being kicked, shoved, pushed, hit with a fist and threatened with a gun or weapon by an intimate partner) perpetrated against them by their intimate partner. Non-partner violence included rape and attempted rape. A count variable was created: if the respondent experienced 1 or more of these incidents it was coded as experiencing violence. The count variable was coded into a binary variable where 0 = did not experience any violence and 1 = experienced violence. This was in line with previous uses of the scale;
- Sexual behaviour information including age of sex initiation, partner characteristics (including age, number, type [regular/casual], circumcision status, HIV status), condom use, engagement in transactional sex, prevalence of intimate partner, and non-partner violence;

- Health-seeking behaviour, including HIV testing (date of last HIV test, HIV test results) and HIV treatment (initiation date);
- Pregnancy in their lifetime;
- Diagnosis of an STI by a health care professional;
- Contraceptive use and the types of contraceptives used;
- HIV prevention interventions, such as attending condom training, accessing school programmes and attending contraceptive use or training;
- Data on HIV prevention intervention outcomes, such as access to PrEP, safe spaces and free condoms. In this case outcomes refer to the end result of HIV prevention interventions.

2.5.4 HIV testing

On completion of the socio-demographic data collection, field workers offered AYGW participants a rapid HIV test, guided by NDoH HIV testing protocols^[58]. Caregivers of AGYW below the age of 18 provided written consent for AGYW to receive their HIV results and provide at the end of the survey. AGYW also provided written consent for HIV counselling and testing (HTC). HTC was provided to 66.2% of the AGYW, 2.3% refused testing as they were already on Antiretrovirals, 22.4% refused saying they already knew their status and 9% said they were too scared to test. HIV testing took place in a room in the house in private. The procedure took approximately 30 minutes and included the HIV rapid test, pre- and post-test counselling. Once the test was completed, HIV test results were given to AGYW but not incidence results which were for research purposes only. Referrals to care, support and treatment were made for AGYW who tested HIV positive. Records of individuals referred for test results, treatment and care were kept.

2.5.5 Biological measures

Study staff trained in phlebotomy collected two micro-containers of whole blood for dried blood spot and plasma specimens. These tests were used to ascertain the HIV status, HIV incidence, treatment drug levels and viral load levels of all AGYW in the study. Blood was drawn from finger pricks. The blood specimens were stored in sterile containers and logged onto a laboratory tracking sheet. The specimens were couriered daily to a laboratory for processing and testing. The Standard Operating Procedure for taking blood was based on the protocols of the South African National Department of Health (NDoH) for taking blood for the HIV Polymerase chain reaction (PCR) test^[59]. HIV incidence was calculated using the Limiting antigen Avidity Index Enzyme Immunoassay (LAG AI EIA).

2.5.6 Compensation


Caregivers and AGYW were compensated nominally for their time with a gift valued between 2 to 3 United States Dollars.

2.6 Ethical considerations

The study protocol, informed consent and data collection forms were reviewed and approved by the University of KwaZulu-Natal Biomedical Research Ethics Committee (BFC 198/16) and the Provincial Department of Health in both KZN and Gauteng. This project also was reviewed and approved in accordance with the United States Centers for Disease Control and Prevention (CDC) human research protection procedures, though CDC investigators did not interact with human subjects or have access to identifiable data or specimens for research purposes.

2.6.1 Informed consent

The study information sheet was given to all study participants. Verbal consent was obtained from the head of the household for the household composition assessments. Written consent was obtained from all individuals 18 years and older and parental or guardian consent and individual written assent was obtained from all individuals who were younger than 18 years of age. Informed consent was obtained for caregiver interviews as well.



Each study participant was informed about the study and completed an electronic consent form prior to enrolment, in accordance with 21 CFR Part 50 and ICH Good Clinical Practices guidelines^[60]. They were given a paper-based copy of the consent form to retain. All consent forms and data collection instruments were translated from English into the local languages. Back translations were completed and reviewed by a bilingual independent source to ensure the accuracy of the translated information. Questionnaires were administered to participants in their preferred language.

Participants and their caregivers were required to provide written informed consent and AGYW <18 assent for their biological samples to be stored beyond the conclusion of the study for any outstanding study-related procedures, confirmation of results, HIV-related testing, and any potential future additional laboratory tests towards better understanding of HIV infections. If participants did not consent to long-term storage and additional testing, their samples were destroyed upon conclusion of the study and after the completion of all listed protocol testing.

2.6.2 Ethical obligation for follow up care

All study participants were provided with a barcoded card and informed that they had an opportunity to access their study HIV test results. All participants' laboratory test results were sent to the nearest NDoH primary health clinic two weeks post collection of the biological samples for participants to access their test results using their barcoded card. Participants were encouraged to visit the clinic to obtain their results and receive appropriate counselling and referrals to care and treatment. The study team referred participants and confirmed linkage for gender-based violence, sexual assault, child-headed households, and other psychosocial issues which were identified in the field, through training the field team to ask appropriate questions.

2.6.3 Confidentiality


For this study, extensive information was collected from study participants, which included personally identifying or potentially identifying information such as GPS coordinates, address, first names, listing of family members' sensitive sexual and behavioural information. Given the sensitive nature of all these data, study staff were trained not to divulge any study-related information to any person/s outside of the study team. Personal identifying information, including participant's name, address and phone numbers, were stored separately from the study in a secure location. All staff that through the course of their work had knowledge of, or access to personal information about participants, were required to sign a confidentiality agreement as part of their contract.

In order to protect confidentiality, each participant was assigned a unique study person identification (PID) so that their name could not be linked to any of their personal data or laboratory results. The PID was written on all data collection forms; HIV test results and matching occurred only by this identification number, not by participants' names or other identifying information. A master list with each participant's name and their assigned identification number was created and was accessible to the study coordinator or designee. Study-related information was delinked and stored with other staff having limited access to such information. The master list was securely maintained in a password-protected file at the local data management centre. All study data, including lab results, were stored securely. All databases were encrypted, and password-protected. Study data were accessible only to study staff directly involved in this study.

2.7 Procedures

2.7.1 Community consultation and stakeholder partnership

The study team established Community Research Support Groups (CRSG) in all the study districts following the model adopted by the HIV Incidence Provincial Surveillance System (HIPSS)^[61] in the uMgungundlovu district.



Data collection commenced following extensive community engagement and advocacy with local stakeholders including traditional leaders, DREAMS-implementing partners, other public, private, and NGO service providers within the study districts engaged in education, psycho-social support, socio-economic support as well as health services. The CRSG provided a forum for engagement between researchers and community members, preserving the community's best interests and ensuring that members of the study team were aware of any concerns about the research.

2.7.2 Training of study staff

Only female field staff from 20 to 25 years old were recruited to work on the study to ensure that they could relate to the participants interviewed. Study staff were assessed on their comprehension and interviewing skills and completed 20 days of training, which focused on the rationale, purpose, and objectives of this study; study methodology; conducting study assessments, completion of study forms, and collection of data; locating and recruiting participants; etiquette on presenting themselves to the respondents and procedures for enrolling respondents into the study; communication skills, safety in the field, ethical guidelines for research including participants' rights; processes for obtaining informed consent and confidentiality requirements. Specific training was provided on interviewing AGYW on how to create rapport, sensitively address sexual issues and violence. Study staff completed training in Good Clinical Practice, Human Subjects Protection, quality control and quality assurance in data collection and verification, safety, post-exposure prophylactics (PEP), and record keeping.

They were trained in HIV counselling and testing, conducting rapid HIV tests and microtainer blood collection. Biological sample collection was evaluated by a phlebotomist who reported on the aseptic techniques and on the requisite volume of samples collected. Refresher trainings were held throughout the study period.

2.7.3 Household visits and interviews

Study staff identified households using a Global Positioning System (GPS) receiver to record the geographic coordinates of each randomly selected household. Fieldworkers visited approximately 55 households from each SAL. Should a selected household not have an eligible participant, be abandoned, refuse to complete the composition form or should the members be away for an extended period, the next household on the sampling frame would be approached after receiving approval from a supervisor.


Study staff used visual maps to locate the sampled households. The GPS co-ordinates of the household and the questionnaires were available through a mobile application with software programmed by Mobenzi®. The applications on the fieldworker's tablet guided the study staff on identifying the selected households using the GPS co-ordinates, who then approached each household and introduced themselves to the head or the representative of the household. After providing study information, the staff member acquired informed verbal consent for household participation.

All AGYW in the household who met the eligibility criteria and were available to be interviewed were asked to participate in the study. Those who did not wish to participate in the study were asked to provide feedback about their decision for declining in order to characterize the impact of refusal on the study's outcomes. Those who agreed to participate were asked to designate a private location, either inside or outside their residence, where the survey instruments could be administered, and where biological samples could be collected privately.

2.8 Laboratory procedures

Sample collection, processing, shipping and archiving were managed by Global Clinical & Viral Laboratory in Durban. Prepared barcoded sample collection packs were used. Each pack contained two microtainer blood collection tubes, sterile needles, cottonwool balls, and alcohol gauze.

2.8.1 Sample collection procedures



Each enrolled participant's questionnaire and samples were linked using the assigned unique study number. Samples were transported daily to Global Clinical & Viral Laboratory in Durban. The laboratory followed a sample processing algorithm to facilitate onward weekly deliveries to the HIV Surveillance and Sero-Molecular Diagnostic Section, a Division of the National Institute of Communicable Diseases in Johannesburg.

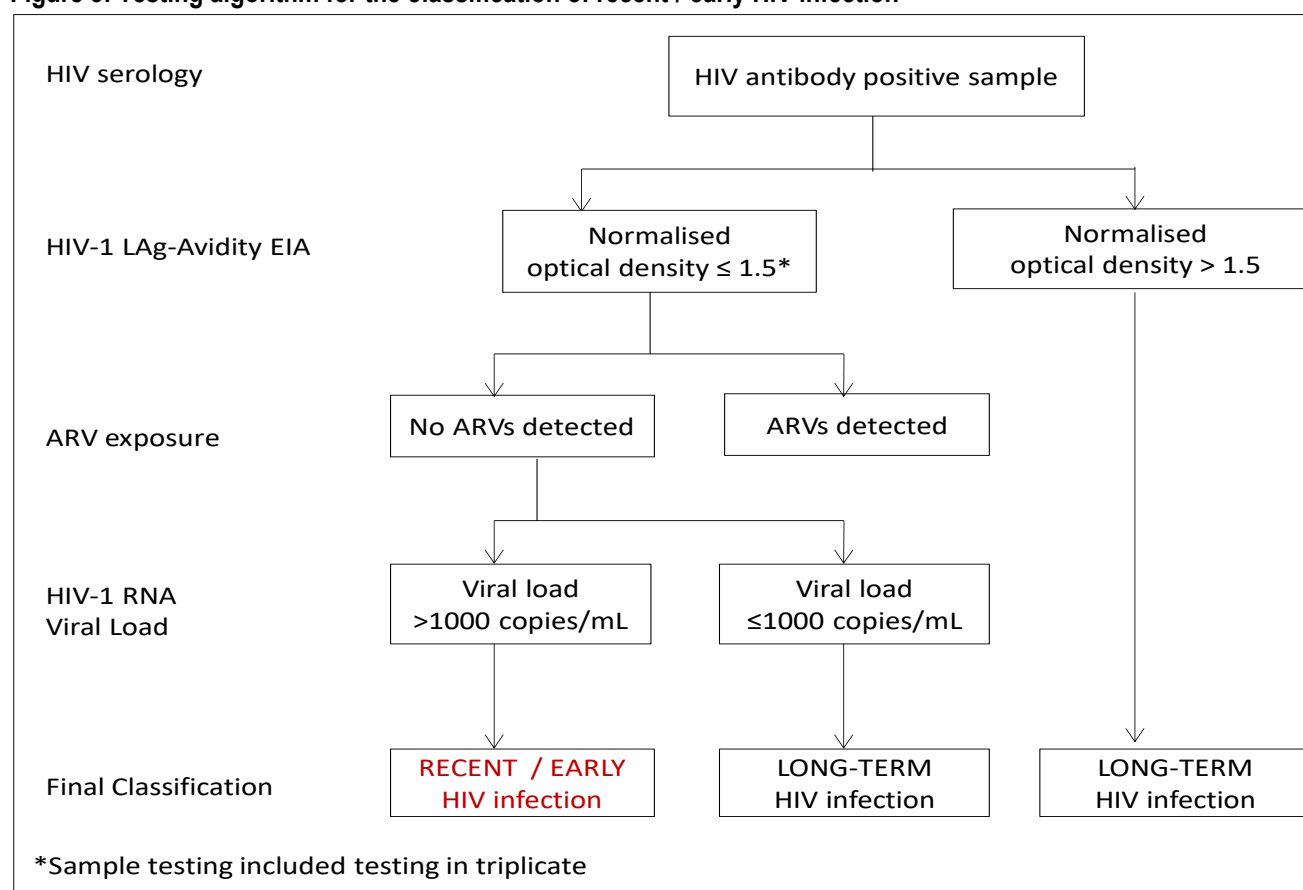
2.8.2 Laboratory testing and return of sample to the facilities

All samples were tested with Genscreen Biorad HIV1/2 Combi Assay and any reactive result was confirmed by a second 4th Generation test (Roche HIV1/2 COMBI COBAS E411). All positive specimens were confirmed by Western Blot. Participants who tested seropositive had individual HIV-1 RNA viral load measurements using Abbott M2000 Real Time PCR platform. Cut-off values: >1000 copies/ml for presence of detectable viral load and ≤1000 copies/ml for undetectable viral load or viral suppression in the presence of ART exposure. ARV exposure was defined as testing positive for one or more ARV drugs using high-performance liquid chromatography (HPLC) coupled with tandem mass spectrometry.

ARVs testing was performed on all HIV positive samples to verify ART use. The laboratory prepared conducted the tests on plasma samples in the Global Clinical Virology Laboratory. Testing was by means of high-performance liquid chromatography (HPLC) coupled with tandem mass spectrometry (Agilent HPLC-Module 1260 Infinity; Mass spectrometer- ABSciex 6.5+). Qualitative detection of ARVs included efavirenz, emtricitabine, lamivudine, lopinavir, nevirapine, abacavir, tenofovir, and zidovudine, which covered all regimens in use in the public sector in the area. The qualitative screening method used for this project was developed and validated in-house, ensuring that the method was accurate, sensitive, and selective enough for the purposes of the study. Positivity was based on a low cut-off level specified for each analyte to allow for adequate ARV detection. Internal standards and negative controls were used with each test batch and results were reported as positive or negative.

Participants who tested HIV seropositive confirmed by Western blot were tested for recency by the LAg Avidity EIA. Any specimen with an ODn<1.5 was classified as recently infected and a specimen with an ODn >1.5 was classified as long-term. The final classification was based on the RITA classification shown in Figure 3. The RITA took into account exposure to ART and viral load cut-off for a final classification of recent infection.

Figure 3: Testing algorithm for the classification of recent / early HIV infection



The results that were returned to clinics for participant collection are also listed in the table. HIV results were sent back to the local Department of Health clinics within 2 weeks of specimen collection, so that participants could receive their results in a timely manner. Participants were notified that results could be collected at their local clinic.


2.8.3 Sample storage and archiving for future testing

Assent and/or informed consent was obtained from participants for long term storage of clinical samples for undertaking additional laboratory tests towards better understanding of HIV infections. Excess clinical samples were stored in ultra-freezers to resolve laboratory queries, for quality assurance and in future to confirm results, evaluate new assays for acute or recent HIV infection for annual HIV incidence measurement, test samples to determine predisposing biological susceptibility for HIV acquisition and for enhancing understanding on the spread of HIV in this community.

2.8.4 Laboratory quality control

Global Clinical & Viral Laboratory is accredited by the South African National Accreditation System (SANAS) and participates in the United Kingdom National External Quality Assessment Service (NEQUAS) as well as the College of American pathologist (CAP) external quality assurance programmes. NICD is ISO 15189–2012 / SANAS accredited and participates in the Proficiency Testing quality assurance programme which includes Quality Control for Molecular Diagnostics and Virology Quality Assurance for molecular methods and NEQAS and CAP for serology related methods.

Internal audits were undertaken for quality assurance and verification of transcription from raw data to final reports. A 10% quality check of raw data against the final reported results was carried out at Global Clinical Virology laboratory every month and at NICD every three months. The quality assurance checks also included



checking of internal and external quality assurance review, staff training and competency review and instrument service and maintenance review.

2.9 Data Quality

2.9.1 Field quality control

A field team supervisor used tracking software to identify where the field team were operating and conducted spot checks and shadow visits to ensure data quality and Standard Operating Procedures were followed. Automated reports were received daily on missing lab samples, questionnaires, and irregularities in data collection that were flagged, such as data collected outside of expected GPS coordinates.

A separate, dedicated quality control team revisited 10% of the randomly selected households to verify that the correct households had been visited and verify data collection and confirm that the SOPs had been followed by the field team.

2.9.2 Data quality checks

Using the Mobenzi® system, study teams, their activities and data quality were observed in real time. The data team monitored the time spent and the duration of the interviews. With the web interface, any anomalies could be verified and resolved immediately, and corrective actions taken. Daily checks and reports were generated for each staff member to assess data completion and discrepancies and reviewed to assess whether errors required any additional training. The integrated suite of Mobenzi® tools provided a turn-key solution for data collection, fieldwork management, protocol automation, and record-keeping. These core functions were augmented by in-field participant verification, integration of laboratory results, and real-time data analysis which improved operational efficiency and data integrity.

2.9.3 Questionnaire and data downloads

Questionnaire data collected from the field using Mobenzi® software were stored on the Mobenzi® server which was hosted by the Amazon Web Service (AWS). The server provided security such as physical access control and online protection through a firewall to protect against hacking and viruses. The data were backed up every four hours and had built-in redundancy. The IT infrastructure used by AWS was aligned with security best practices.


Personal identifying information such as name, household address and GPS location was stored separately from the questionnaire data and was password-protected, thereby protecting the participant's privacy. This information was stored on a separate database linked with a barcode.

All HIV-related laboratory data were stored in a dedicated password-protected excel spreadsheet designed to reduce the manual entry of data. All laboratory results were merged in the Mobenzi® system using the participant identifying number.

2.10 Data analysis

2.10.1 Data analysis

Data were analysed using STATA 14 software. Descriptive analyses, including counts and frequencies, are presented. For the households, access to social grants, food security, household income status and number of household members are presented. For AGYW enrolled in the study descriptive analyses included individual level sociodemographic characteristics, HIV incidence, HIV prevalence (by sociodemographic and behavioural characteristics), HIV knowledge and attitudes, psychosocial measures, sexual behaviours, ARV and viral load measures, linkage to care, sexually transmitted infections, pregnancy, substance use, coverage of condom use and exposure to HIV prevention interventions and outcomes. For caregivers enrolled in the study descriptive



analyses included individual level sociodemographics, self-reported HIV prevalence, finding from discussions on sex with caregivers, parenting practices of the caregivers, caregiver interactions with AGYW, caregivers' perceptions of AGYW behaviour, and caregivers' exposure to HIV prevention interventions.

2.10.2 Weighting of data

To adjust for non-response and to facilitate interpretation of results at the provincial level, sample weights were introduced. The final sampling weight was the product of the SAL weight, and the household weight, adjusted for individual non-response. The final individual weights were benchmarked to the 2018 mid-year AGYW population estimates by age and province.

Weights were calculated considering the probability of selecting the SAL, the probability of selecting the household in the SAL area, and the probability of selecting the individual in a household which was adjusted for non-response. The weights were then revised to reflect the size of the population in the study area.

The study employed a multistage sampling approach, stratified by district. The weights were calculated in three stages. In the first stage, the probability of selection of the SAL was calculated. SALs were selected proportional to size, where size was defined as the number of households in a SAL. The probability of selecting a particular SAL was therefore the product of the number of selected SALs and the number of households in a particular SAL, divided by the total households in a particular stratum. In the second stage, the probability of selection of a household was calculated. The probability of selection of a household was the number of households selected in the SAL (n=55 in all SALs) divided by the total number of households in the SAL (this included occupied and unoccupied houses).

Within each SAL, the number of households that were found to be not eligible or who refused participation or could not be contacted was calculated. The weight for a household was then calculated as the reciprocal of the probability of selection multiplied by the probability of responding, thus inflating weights for non-response. Adjustment for household non-response was done by combining adjacent SALs so that there was a minimum of 30 responding households per adjustment area. Household weights above the 97.5th percentile and below the 2.5th percentile were truncated to remove extreme weights. This meant that if the weight at the 97.5th percentile was 2.3, then all weights higher than that were replaced with 2.3 (the value of the weight at the 97.5th percentile).

The proportion of individuals of AGYW who refused participation was calculated separately for the following age groups: 12–14 years, 15–19 years, and 20–24 years. The individual weight was then calculated as the reciprocal of the probability of selection multiplied by the probability of responding. This inflated the weights for individuals of the same age groups (12–14 years, 15–19 years, and 20–24 years) who refused participation. The weight for each individual AGYW was calculated as the product of the three weights calculated in the three stages (SAL weight, household weight, and individual weight).

The final step was to benchmark these weights against STATS SA midyear population estimates for 2018 by age group for areas where DREAMS interventions were implemented to ensure that the weights of the participants sampled added up to the population estimates for the area. This meant that the weight of an individual could be thought of as the number of people in the community that the selected AGYW represents. The population in the DREAMS areas was calculated by calculating the proportion of the 2011 population in each district and age group that resided in DREAMS intervention areas (SALs). These proportions were then applied to the 2018 StatsSA mid-year population estimates, yielding a 2018 estimate of the population of AGYW in DREAMS areas. These estimates are presented in Table 2.

Table 2: AGYW Study Area Population estimates 2018

District Population AGYW 2018	12–14 years	15–19 years	20–24 years	Total
GP: COJ Metropolitan Municipality	97 417	190 130	241 300	528 847
GP: Ekurhuleni Metropolitan Municipality	69 171	133 454	167 243	369 868
KZN: eThekweni Metropolitan Municipality	75 719	151 633	181 399	408 751
KZN: uMgungundlovu District Municipality (DC22)	26 005	49 164	54 296	129 465
DREAMS Selected Areas 2018 Population	12–14 years	15–19 years	20–24 years	Total
GP: COJ Metropolitan Municipality	35 727	68 983	82 370	187 080
GP: Ekurhuleni Metropolitan Municipality	24 648	48 496	64 226	137 371
KZN: eThekweni Metropolitan Municipality	21 103	41 964	48 500	111 567
KZN: uMgungundlovu District Municipality (DC22)	11 669	22 305	23 563	57 537

Source: 2018 StatsSA mid-year population estimates, Abbreviations: COJ=City of Johannesburg, GP=Gauteng, KZN=KwaZulu-Natal

2.10.3 Analysis of the primary objective

The AGYW study used the Limiting-Antigen Avidity Index Enzyme Immunoassay (Lag AI EIA) to estimate recent HIV infection. The Lag EIA has been shown to be a reliable method of generating cross-sectional incidence estimates⁶².



3 RESULTS

3.1 Study response rate

The study was conducted from March 13, 2017 to June 22, 2018. Household composition forms were completed with 63 618 houses, of which 34 782 (55%) had no eligible AGYW who met the inclusion criteria. A total of 1 579 (2%) declined to participate, 6 549 were not available after 3 contact attempts, and 3 863 (6%) of the visiting points were non-residential buildings. A total of 18 424 households met the enrolment criteria, of which 16 845 (26.5%) households were enrolled. The study response rate at the household level was 91.4%. We enrolled 18 707 AGYW, of whom 409 (2%) participants were excluded due to not having questionnaire data (Fieldworker collected samples but were unable to complete the questionnaire). A total of 18 298 (97.8%) AGYW were included in the analytic sample. There were 18 707 AGYW in the households. The study response rate at an individual level was 97.8%. Disaggregation by age highlights that there were 7 656 (42%) AGYW 12–17 years of age and 10 640 (58%) AGYW 18–24 years of age. Disaggregation by province indicates that 10 384 (57%) AGYW were enrolled in COJ and Ekurhuleni and 7 914 (43%) AGYW were enrolled in eThekweni and uMgungundlovu. There were 6 487 caregivers of AGYW below 18 years of age enrolled. Of these 3 652 (56%) caregivers were enrolled in COJ and Ekurhuleni and 2 853 (44%) caregivers were enrolled in eThekweni and uMgungundlovu. Figure 4 below shows the enrolment figures.

Figure 4: AGYW Study response rate 2018



Abbreviations: AGYW=Adolescent Girls and Young Women

3.2 Household findings

3.2.1 Number of members per household

The distribution of the number of household members per household is shown in Table 3. Overall, the average household size was 5.1 members (median was 5). The median household size in Gauteng was 4 members (Interquartile range [IQR]: 3–6) and in KZN it was 5 members (IQR: 4–7). Overall, 46.1% of households in the study had from 5 to 9 members as residents in the household. In Gauteng, 41.6% of households had 5 to 9 people as residents in the household and in KZN 52.4% of households had 5 to 9 people as residents in the household.

Table 3: AGYW Study number of household members per household 2018

	Ekurhuleni & the COJ (GP)		uMgungundlovu & eThekweni (KZN)		Consolidated	
	%	n	%	n	%	n
Total number of HH Members						
1 Member	1.8	134	0.7	36	1.3	170
2 Members	13.4	1 004	6.6	360	10.5	1 364
3 Members	19.5	1 467	13.0	707	16.8	2 174
4 Members	19.5	1 464	17.2	936	18.5	2 400
5–9 Members	41.6	3 123	52.4	2 849	46.1	5 972
10+ Members	4.2	318	10.1	548	6.7	866
Total	100%	7 510	100	5 436	100	12 946

Notes: Weighted percentage reported. Abbreviations: COJ=City of Johannesburg, GP=Gauteng, KZN=KwaZulu-Natal

3.2.2 Primary source of household income

Table 4 highlights the sources of income in the study households. The majority (61.0%) of households indicated receiving a formal salary or wage and just less than half (45.5%) indicated that grants were their primary source of income. Only 9.2% indicated they received support from a family member as a form of income. In Gauteng, 41.3% of households indicated they claim a government grant as their primary source of income. More than half (51.4%) of all households in KZN claimed a government pension or grant as the primary source of income.

Table 4: AGYW Study primary source of household income 2018

		Ekurhuleni & the COJ (GP)		uMgungundlovu & eThekwini (KZN)		Consolidated	
		%	n	%	n	%	n
		Main Income from a salary					
No		41.5	3 130	35.6	1 948	39.0	5 078
Yes		58.5	4 407	64.4	3 521	61.0	7 928
Total		100	7 537	100	5 469	100	13 006
		Main income from family support					
No		89.1	6 715	93.1	5 093	90.8	11 808
Yes		10.9	822	6.9	376	9.2	1 198
Total		100	7 537	100	5 469	100	13 006
		Main Income from grants					
No		58.7	4 423	48.6	2 660	54.5	7 083
Yes		41.3	3 114	51.4	2 809	45.5	5 923
Total		100	7 537	100	5 469	100	13 006

Notes: Weighted percentage reported. Abbreviations: COJ=City of Johannesburg, GP=Gauteng, KZN=KwaZulu-Natal

3.2.3 Total monthly household income

Table 5 highlights that more than half (54.1%) of the study's households earned between R1 001 (\$101) and R5 000 (\$500) per month. Nearly one-fifth of households earned less than R1 000 per month. In Gauteng, just less than one-fifth (19.9%) earned less than R1 000 (\$500) per month, and 18.1% in KZN earned less than R1 000 (\$101) per month. In Gauteng 51.3% of households earned between R1 001 (\$101) and R5 000 (\$500) per month, whereas in KZN 58.0% of households fall within this income category.

Table 5: Total monthly household income for AGYW 12–24 years in the AGYW Study 2018

	Ekurhuleni & the COJ (GP)		uMgungundlovu & eThekweni (KZN)		Consolidated	
	%	n	%	n	%	n
Total household income						
Less than R1000 per month (\$100)	19.9	1 498	18.1	988	19.1	2 486
Between R1001–R5000 per month (\$101–\$500)	51.3	3 866	58.0	3 172	54.1	7 038
More than R5001 per month (\$501)	16.1	1 213	17.2	943	16.6	2 156
Don't know	10.3	774	5.2	287	8.2	1 061
Refused	2.5	186	1.4	79	2.0	265
Total	100	7 537	100	5 469	100	13 006

Notes: Weighted percentage reported. Abbreviations: COJ=City of Johannesburg, GP=Gauteng, KZN=KwaZulu-Natal, AGYW=Adolescent Girls and Young Women

3.2.4 Receipt of state grants in household

Overall, 67.9% of households reported receiving a government grant (see Table 6). Nearly two-thirds (63.3%) of the households in Gauteng accessed government grants and three-quarters (74.6%) of households in KZN accessed a government grant.

Table 6: Receipt of state grants in household for AGYW 12–24 years in the AGYW Study 2018

	Ekurhuleni & the COJ (GP)		uMgungundlovu & eThekweni (KZN)		Consolidated	
	%	n	%	n	%	n
Does the household receive any grants?						
No	34.9	2 474	24.4	1 161	30.7	3 635
Yes	63.3	4 490	74.6	3 548	67.9	8 038
Don't know	1.2	86	0.6	29	1.0	115
Refused	0.6	40	0.3	16	0.5	56
Total	100	7 090	100	4 754	100	11 844

Notes: Weighted percentage reported. Abbreviations: COJ=City of Johannesburg, GP=Gauteng, KZN=KwaZulu-Natal, AGYW=Adolescent Girls and Young Women

3.2.5 Household food security

Nearly a quarter (24.2%) of households could be classified as food insecure (see Table 7). Food insecurity was defined as the household “ran out of money to buy food during the previous year”. More than a quarter of households in Gauteng were food insecure (26.6%) and just over one-fifth of households in KZN were food insecure (20.9%).

Table 7: Household food security for AGYW 12-24 years in the AGYW Study 2018

	Ekurhuleni & the COJ (GP)		uMgungundlovu & eThekwini (KZN)		Consolidated	
	%	n	%	n	%	n
Ran out of money to buy food in the previous year						
No	73.1	5 510	78.7	4 305	75.5	9 815
Yes	26.6	2 002	20.9	1 143	24.2	3 145
Refused	0.3	25	0.4	21	0.4	46
Total	100	7 537	100	5 469	100	13 006

Notes: Weighted percentage reported. Abbreviations: COJ=City of Johannesburg, GP=Gauteng, KZN=KwaZulu-Natal, AGYW=Adolescent Girls and Young Women

3.3 Adolescent girls and young women (12–24 years)

3.3.1 Sociodemographic characteristics

Sociodemographic characteristics of AGYW

Table 8 highlights the socio-demographic characteristics of all AGYW enrolled in the study. Among the enrolled AGYW, 18.9% were 12 to 14 years old, 36.8% were 15 to 19, and 44.3% from 20 to 24 years old. Nearly half of AGYW were 20 to 24 years old in Gauteng (45.2%) and KZN (42.6%). The median age for the total sample of AGYW was 19 years (IQR: 15–21); the age profile by province was relatively similar. Nearly two-thirds (65.8%) of the total sample of AGYW spoke Zulu as their home language and 12.2% spoke Sotho as their home language. In KZN, the vast majority (96.8%) spoke Zulu and in Gauteng province just less than half (49.7%) spoke Zulu, followed by Sotho (18.1%). Only a minority (6.3%) of AGYW had been away from home for 1 consecutive month or longer in the previous 12 months. The majority (87.4%) of AGYW had always lived in the community they stay in currently and approximately one-tenth (9.6%) moved to the community they currently stay in more than one year ago. Nearly a fifth (17.0%) of AGYW's biological mothers were no longer alive while in Gauteng, 15.5% of AGYW's biological mothers were no longer alive and in KZN, 19.8% of AGYW's biological mothers were no longer alive anymore. About a third (29.4%) of AGYW's biological fathers were no longer alive. In Gauteng, more than a quarter (27.4%) of AGYW's biological fathers were no longer alive. In KZN, just under one-fifth (19.8%) of AGYW's biological fathers were no longer alive. Nearly half (49.4%) of all AGYW are currently dating someone although they are not cohabiting and 45.3% of AGYW are not in a relationship with anyone.

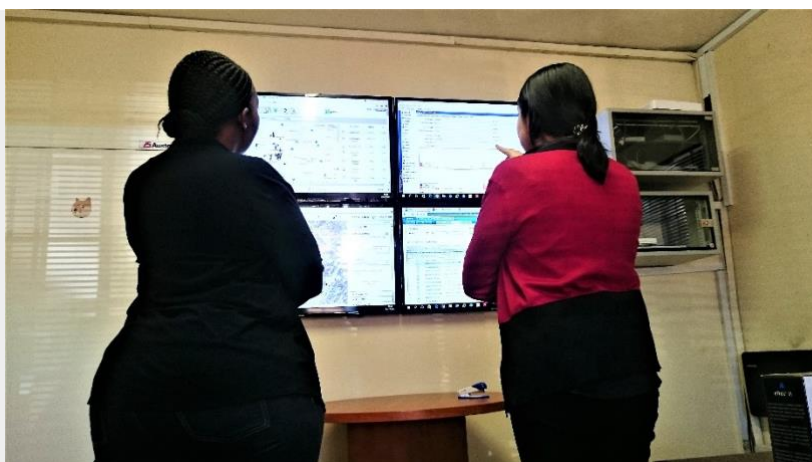


Table 8: Sociodemographic characteristics of AGYW in AGYW Study 2018

	Ekurhuleni & the COJ (GP) Sample n=10 384		uMgungundlovu & eThekweni (KZN) Sample n=7 912		Consolidated Sample n=18 296	
Median (IQR) age	19 (15–22)		19 (15–21)		19 (15–21)	
Age	n	%	n	%	n	%
12–14 years	2 350	18.6	1 820	19.4	4 170	18.9
15–19 years	3 992	36.2	3 006	38.0	6 998	36.8
20–24 years	4 042	45.2	3 086	42.6	7 128	44.3
Home language						
Zulu	5 187	49.7	7 675	96.8	12 862	65.8
Xhosa	810	7.7	134	1.7	944	5.6
Sotho	1 863	18.1	56	0.8	1 919	12.2
English	202	2.2	37	0.6	239	1.6
Afrikaans	224	2.2	1	0.0	225	1.5
Tswana	1 049	10.2	9	0.1	1 058	6.7
Other	1 049	10.0	0	0.0	1 049	6.6
Race						
African	10 052	96.6	7 879	99.5	17 931	97.6
Coloured	317	3.3	12	0.2	329	2.2
White	3	0.0	1	0.0	4	0.0
Asian/Indian	4	0.0	18	0.3	22	0.1
Other	8	0.1	2	0.0	10	0.1
Nationality						
South African citizen	10 214	98.3	7 894	99.8	18 108	98.8
Refugee	51	0.5	7	0.1	58	0.4
Non-citizen*	113	1.2	8	0.1	121	0.8
Other	6	0.1	3	0.0	9	0.0
Away from home >1 mo. In previous 12 mo.						
No	9 752	93.5	7 465	93.7	17 217	93.6
Yes	617	6.4	437	6.2	1 054	6.3
Refused	15	0.1	10	0.1	25	0.1
Length lived in this community						
Always	9 105	87.3	7 005	87.7	16 110	87.4
Moved here < 1 year ago	300	3.0	231	3.0	531	3.0
Moved here > 1 year ago	977	9.8	673	9.3	1 650	9.6
Refused	2	0.0	3	0.0	5	0.0
Biological mother still alive						
No	851	15.5	808	19.8	1 659	17.0
Yes	4 656	83.8	3 402	79.7	8 058	82.3
Don't know	32	0.6	9	0.3	41	0.5
Refused	9	0.2	15	0.3	24	0.2
Biological father still alive						
No	1 502	27.4	808	19.8	2 310	29.4
Yes	3 730	66.7	2 715	63.4	6 445	65.6
Don't know	285	5.3	9	0.3	294	4.4
Refused	31	0.5	15	0.3	46	0.6
Current relationship status [^]						
Single	4 984	44.8	3 891	46.3	8 875	45.3
Dating [†] & not cohabiting	4 754	48.3	3 858	51.3	8 612	49.4
Dating [†] & cohabiting	510	5.4	97	1.4	607	4.0

Notes: Weighted percentages reported; * Temporary or Permanent resident; ^ Does not add up to 100% as some categories excluded; † dating was defined as someone they were engaging in a relationship seriously or casually. Abbreviations: COJ=City of Johannesburg, GP=Gauteng, KZN=KwaZulu-Natal, AGYW=Adolescent Girls and Young Women

3.3.2 Employment status of AGYW over 19 years of age

Table 9 shows the employment status of individuals older than 19 years. Just over one-tenth (13.5%) of AGYW older than 19 years were employed on a full-time or part-time basis. Younger girls (15–19 years old) were less likely to be employed than girls aged 20–24 years old in Gauteng (4.1% vs. 13.3%) and KZN (3.92% vs. 14.0%). However, adolescent girls aged 15–19 years old were much more likely to be in school than young women aged 20–24 years old and therefore less likely to be employed.

Table 9: Employment status of AGYW by age in the AGYW Study 2018

Employment by 3 year age bands	Ekurhuleni & the COJ (GP)		uMgungundlovu & eThekweni (KZN)		Consolidated	
	%	n	%	n	%	n
12–14 years	0	0	0	0	0	0
15–19 years	4,1	39	3,7	29	3.4	68
20–24 years	13,3	416	1,4	344	13.5	760
Total	11.7	455	11.9	370	11.8	825

Notes: Weighted percentage reported. *employed refers to employed by another person or business or self-employed on a full-time or part-time basis. Abbreviations: COJ=City of Johannesburg, GP=Gauteng, KZN=KwaZulu-Natal, AGYW=Adolescent Girls and Young Women

3.3.3 Current school attendance

Table 10 highlights current school attendance for AGYW aged 12–24 years old. More than half of AGYW were enrolled in school in Gauteng (56.9%) and KZN (59.0%). The school attendance rates were very high for young adolescents 12–14 years old in Gauteng (97.6%) and KZN (97.5%). Approximately three quarters of 15–19-year-old girls in Gauteng (76.4%) and KZN (77.0%) were enrolled in schools. Approximately one quarter of 20–24-year olds were still in school in Gauteng (24.5%) and KZN (25.3%).

Table 10: Current school attendance for AGYW 12–24 years old in the AGYW Study 2018

Currently attending school	Ekurhuleni & the COJ (GP)		uMgungundlovu & eThekweni (KZN)		Consolidated	
	%	n	%	n	%	n
12–14 years	97.6	2 295	97.5	1 766	97.6	4 061
15–19 years	76.4	2 625	77.0	1 977	76.7	4 602
20–24 years	24.5	1 390	25.3	1 083	24.8	2 437
Total	56.9	6 310	59.0	4 826	57.9	11 136

Notes: Weighted percentage reported. Abbreviations: COJ=City of Johannesburg, GP=Gauteng, KZN=KwaZulu-Natal, AGYW=Adolescent Girls and Young Women

3.3.4 Knowledge relating to HIV prevention

AGYW were asked 5 items assessing their knowledge of HIV prevention. The proportions that responded “yes” to the 7 items are presented in Table 11 below by province and age categories. Nearly three-quarters (73.7%) of AGYW affirmed that using condoms during sex reduces one’s chance of contracting HIV and a similar proportion (73.4%) confirmed that healthy-looking people can have HIV. Nearly two-thirds (64.1%) of respondents affirmed that having sex with only one uninfected partner who has sex with no-one else reduces one’s chances of contracting HIV. Just more than a third (35.6%) of AGYW confirmed their understanding that taking ART reduces an HIV positive person’s chance of transmitting the disease.

Younger adolescent girls (12–14 years) had poorer HIV knowledge than older AGYW. The results for the item “can sex with only one uninfected partner reduce one’s risk of contracting HIV” highlighted that just less than half (48%) of adolescent girls aged 12 to 14 years old correctly answered “yes”, whereas more than two-thirds (68%) of young women 20 to 24 years old in Gauteng correctly answered “yes” to this statement. A similar pattern occurred in KZN for this item and on other HIV prevention knowledge items.

Table 11: Knowledge on HIV Prevention among AGYW 12–24 years old in the AGYW Study 2018

	Ekurhuleni & the COJ (GP)		uMgungundlovu & eThekwini (KZN)		Consolidated	
	%	n	%	n	%	n
Can sex with only one uninfected partner reduce risk of getting HIV? (% yes)						
12–14 years	48.0	1 106	56.3	1 035	50.9	2 141
15–19 years	63.3	2 505	68.4	2 064	65.1	4 569
20–24 years	68.0	2 722	70.7	2 202	68.9	4 924
Total	62.6	6 333	67.0	5 301	64.1	11 634
Can the use of condoms during sex reduce risk of getting HIV? (yes)						
12–14 years	57.9	1 339	68.6	1 253	61.7	2 592
15–19 years	71.1	2 830	79.9	2 389	74.2	5 219
20–24 years	76.3	3 059	83.1	2 560	78.5	5 619
Total	71.0	7 228	79.0	6 202	73.7	13 430
Can a healthy-looking person have HIV/AIDS? (yes)						
12–14 years	61.7	1 437	64.7	1 176	62.7	2 613
15–19 years	75.0	2 980	72.4	2 173	74.1	5 153
20–24 years	78.1	3 147	75.8	2 339	77.4	5 486
Total	71.0	7 564	79.0	5 688	73.4	13 252
Can ART reduce risk of transmission? (yes)						
12–14 years	26.4	607	32.0	595	28.3	1 202
15–19 years	32.8	1 294	42.9	1 299	36.4	2 593
20–24 years	34.5	1 396	45.0	1 398	38.0	2 794
Total	32.4	3 297	41.7	3 292	35.6	6 589
Is a woman completely protected if her partner is circumcised? (no)						
12–14 years	54.0	1260	62.8	1162	57.1	2422
15–19 years	67.5	2703	76.0	2307	70.5	5010
20–24 years	72.5	2935	79.9	2486	74.9	5421
Total	67.2	6898	75.1	5955	69.9	12853

Notes: Weighted percentage reported. Abbreviations: COJ=City of Johannesburg, GP=Gauteng, KZN=KwaZulu-Natal, AGYW=Adolescent Girls and Young Women

3.3.5 Self-efficacy to use condoms

Table 12 highlights that self-efficacy to use condoms was moderate among AGYW (Mean = 4.4, Range: 0–9). The results highlight that younger adolescents, 12–14 years old, had lower self-efficacy than young women aged, 20–24 years old in Gauteng (M = 2.0 vs. 5.5, $p < 0.001$ respectively) and KZN (M = 2.2 vs. 5.6, $p < 0.001$ respectively). Older adolescents (15–19 years old) had a higher level of self-efficacy to use condoms than young adolescents in Gauteng (M=4.2 vs. 2.0, $p < 0.001$ respectively) and KZN (M= 3.9 vs. 2.2, $p < 0.001$ respectively).

Table 12: Self-efficacy to use condoms among AGYW 12–24 years old in the AGYW Study 2018

	Ekurhuleni & the COJ (GP)		uMgungundlovu & eThekwini (KZN)		Consolidated	
	M(SD)	n	M(SD)	n	M(SD)	n
Self-efficacy to use condoms (a)						
12–14 years	2.0(2.8)	2 350	2.2(2.8)	1 820	2.1(2.8)	4 170
15–19 years	4.2(3.2)	3 993	3.9(3.3)	3 005	4.1(3.2)	6 998
20–24 years	5.5(3.0)	4 043	5.6(3.0)	3 085	5.6(3.0)	7 128
Total	4.4(3.3)	10 386	4.3(3.3)	7 910	4.4(3.3)	18 296

Notes: Weighted percentage reported; M = Mean; SD = Standard Deviation; a) is the condom use self-efficacy scale values range from 0–9 and a higher score is indicative of greater self-efficacy to use a condom. Abbreviations: COJ=City of Johannesburg, GP=Gauteng, KZN=KwaZulu-Natal, AGYW=Adolescent Girls and Young Women

3.3.6 Risk Perceptions for contracting HIV

The results for risk perceptions highlight that overall AGYW are likely to view themselves as not at risk of contracting HIV ($M = 1.9$, range: 0–3; see Table 13). Young adolescents (12–14 years old) are more likely to view themselves as not at risk of contracting HIV than women aged 20–24 years old ($M = 2.1$ vs. 1.8 in Gauteng and $M = 2.2$ vs. 1.9 in KZN).

Table 13: Risk perceptions for contracting HIV among AGYW 12–24 years old in the AGYW Study 2018

	Ekurhuleni & the COJ (GP)		uMgungundlovu & eThekweni (KZN)		Consolidated	
Risk perception (a)	M(SD)	n	M(SD)	n	M(SD)	n
12–14 years	2.1(1.0)	2 335	2.2(0.9)	1 788	2.1(1.0)	4 123
15–19 years	1.9(1.0)	3 914	2.1(0.9)	2 894	2.0(1.0)	6 808
20–24 years	1.8(1.0)	3 886	1.9(0.9)	2 767	1.8(1.0)	6 653
Total	1.9(1.0)	10 135	2.1(0.9)	7 449	1.9(1.0)	17 584

Notes: Weighted percentage reported; M = Mean; SD = Standard Deviation. a) the item asked respondents if they believed they were at risk of contracting HIV. Higher score indicates a lower perceived risk of contracting HIV, values range from 0–3. Abbreviations: COJ=City of Johannesburg, GP=Gauteng, KZN=KwaZulu-Natal, AGYW=Adolescent Girls and Young Women

3.3.7 Sexual behaviour and condom use of AGYW

Sexual behaviour

Overall, just less than half (49.9%) of AGYW had ever had sex (see Table 14). Of those who had ever had sex and were older than 14 years old, 15.9% had engaged in sexual activity by age 15 years. Just less than a third (32.3%) of all AGYW had a sex partner in the previous 12 months who was five or more years older (age-disparate partnership). In Gauteng, slightly more than a third (34.5%) of AGYW had an age-disparate sex partner in the previous 12 months. In KZN more than a quarter (27.8%) had an age-disparate sex partner in the previous 12 months. More than a third (37.7%) of young women (20–24 years) in Gauteng had an age-disparate sex partner in the previous 12 months, whereas 29.5% of young women (20–24 years old) in KZN had an age-disparate sex partner in the previous 12 months. More than a quarter (27.3%) of adolescent girls (15–19 years old) in Gauteng engaged in age-disparate sex in the previous 12 months, whereas just less than a quarter (23.7%) of adolescent girls (15–19 years old) engaged in age-disparate sex in the previous 12 months. Approximately, one-tenth (9.9%) of AGYW engaged in transactional sex in the previous 12 months. AGYW had on average 2.6 partners over their lifetime. In Gauteng, young women 20–24 years old had on average 3.1 sexual partners in their lifetime.

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Table 14: Sexual behaviour of AGYW 12–24 years old for the AGYW Study 2018

	Ekurhuleni & the COJ (GP)		uMgungundlovu & eThekweni (KZN)		Consolidated	
	%/M(SD)	n	%/M(SD)	n	%/M(SD)	n
Ever had sex (Yes)						
12–14 years	2.4	56	1.8	31	2.2	87
15–19 years	41.0	1 634	38.8	1 147	40.2	2 781
20–24 years	77.5	3 099	79.9	2 447	78.3	5 546
Total	50.3	4 789	49.1	3 625	49.9	8 414
Age of sexual debut (≤ 15 years old)[#]						
15–19 years	26.5	435	28.7	299	27.2	734
20–24 years	11.2	354	10.5	236	11.0	590
Total	15.8	789	16.1	535	15.9	1 324
In the past 12 months have any of your sexual partners been five or more years older* (Yes)						
12–14 years	26.0	15	33.2	10	27.9	25
15–19 years	27.3	450	23.7	263	26.1	713
20–24 years	37.7	1 162	29.5	698	35.0	1 860
Total	34.5	1 627	27.8	971	32.3	2 598
Engaged in transactional sex in the previous 12 mo. (Yes)[^]						
12–14 years	3.5	2	0.0	0	2.5	2
15–19 years	7.4	125	7.5	90	7.4	215
20–24 years	11.2	351	10.9	281	11.1	632
Total	10.0	478	9.8	371	9.9	849
Total number of partners in lifetime (mean[SD])						
12–14 years	1.0(1.1)	56	0.9(0.6)	30	1.0(1.0)	86
15–19 years	2.0(2.2)	1 634	1.7(1.8)	1 116	1.9(2.1)	2 750
20–24 years	3.1(3.0)	3 098	2.4(3.0)	2 372	2.9(3.7)	5 470
Total	2.8(3.6)	4 788	2.2(2.7)	3 518	2.6(3.4)	8 306

Notes: Weighted percentage reported; M = Mean; SD = Standard Deviation * This is classified as an age-disparate partnership and has been shown to elevate the risk of contracting HIV for young women. ^ Transactional sex includes sex for money; a place to sleep or stay; support or money for their family; help with food, paying bills or school fees; cosmetics, clothes, cell phone, airtime or transportation; braids, hair extensions or weaves; or a car. Abbreviations: COJ=City of Johannesburg, GP=Gauteng, KZN=KwaZulu-Natal, AGYW=Adolescent Girls and Young Women. # Only those older than 14 years old included in this analysis.

Condom use

Table 15 highlights condom use by province and age group among the sexually active AGYW in the study. Of concern, less than half (48.1%) of the sexually active AGYW used a condom the last time they had sex. Just under a half (49.9%) of AGYW in Gauteng used condoms the last time they had sex and 44.5% of AGYW in KZN used condoms the last time they had sex. More than a third (36.4%) of AGYW indicated they never used a condom in the previous 12 months when engaging in sexual activity. Less than a quarter (23.5%) of AGYW in Gauteng used condoms always in the previous 12 months while the minority (14.5%) of AGYW used condoms always in the previous 12 months in KZN. Nearly one-third (32%) of adolescent girls aged 15–19 years old in Gauteng indicated having never used condoms in the previous 12 months, whereas 43.6% in KZN indicated never using condoms in the previous 12 months in the same age category. One-fifth of young women (20–24 years old) in Gauteng indicated they always used condoms and 13.2% of young women (20–24 years old) in KZN indicated always using condoms in the previous 12 months. Just less than one-third (31.6%) of older adolescent girls (15–19 years old) always used condoms in Gauteng and only 17.6% of older adolescents (15–19 years old) in KZN always used condoms.

Table 15: Condom use among sexually active AGYW 12–24 years old for the AGYW Study 2018

	Ekurhuleni & the COJ (GP)		uMgungundlovu & eThekweni (KZN)		Consolidated	
	%	n	%	n	%	n
Used a condom at last time they had sex (Yes)						
12–14 years	53.9	30	30.7	7	47.6	37
15–19 years	58.3	947	43.9	482	53.5	1 429
20–24 years	46.2	1420	44.9	1060	45.8	2 480
Total	49.9	2 397	44.5	1 549	48.1	3 946
How often have you used condoms in the last 12 months when you had sex? (Always/consistently)						
12–14 years	30.6	17	6.9	2	24.2	19
15–19 years	31.6	502	17.6	187	27.0	689
20–24 years	20.0	612	13.2	315	17.8	927
Total	23.5	1 131	14.5	504	20.6	1 635

Notes: Weighted percentage reported; M = Mean; SD = Standard Deviation Abbreviations: COJ=City of Johannesburg, GP=Gauteng, KZN=KwaZulu-Natal, AGYW=Adolescent Girls and Young Women

3.3.8 Substance use

Alcohol and drug use

Alcohol use was very low in the population (M= 0.8, Range: 0–12) (Table 16). The majority (82.3%) did not drink at all in the last 12 months (*data not shown here*). Alcohol use appears to be slightly higher in Gauteng than in KZN (M = 0.9 vs. 0.5, respectively). As expected, young adolescents (12–14 years old) were much less likely to drink alcohol than young women (20–24 years old) in Gauteng (M = 0.1 vs. 1.3, respectively) and KZN (M = 0.0 vs. 0.8, respectively). Overall, drug use was very low with a mean of 0.2 (Range: 0–20). The mean drug use appears to be slightly higher in Gauteng than in KZN (M = 0.2 vs. 0.1, respectively). Young adolescents (12–14 years old) were less likely to use drugs than young women (20–24 years old) in Gauteng (M = 0.0 vs. 0.3, respectively) and KZN (M = 0.0 vs. 0.2, respectively).

Table 16: Alcohol and drug use of AGYW 12–24 years old from the AGYW Study 2018

	Ekurhuleni & the COJ (GP)		uMgungundlovu & eThekweni (KZN)		Consolidated	
	M(SD)	n	M(SD)	n	M(SD)	n
Alcohol use^a						
12–14 years	0.1(0.6)	2 350	0.0(0.4)	1 818	0.1(0.5)	4 168
15–19 years	0.8(1.7)	3 992	0.4(1.3)	2 999	0.7(1.6)	6 991
20–24 years	1.3(2.3)	4 042	0.8(1.8)	3 076	1.1(2.1)	7 118
Total	0.9(1.9)	10 384	0.5(1.4)	7 893	0.8(1.8)	18 277
Drug use^b						
12–14 years	0.0(0.4)	2 339	0.0(0.3)	1 814	0.0(0.4)	4 153
15–19 years	0.2(0.9)	3 950	0.1(0.8)	2 977	0.2(0.9)	6 927
20–24 years	0.3(1.3)	3 989	0.2(0.9)	3 046	0.2(1.2)	7 035
Total	0.2(1.0)	10 278	0.1(0.8)	7 837	0.2(1.0)	18 115

Notes: Weighted means reported; M = Mean; SD = Standard Deviation. Abbreviations: COJ=City of Johannesburg, GP=Gauteng, KZN=KwaZulu-Natal, AGYW=Adolescent Girls and Young Women a) is the AUDIT-C scale, scores range from 0–12; a higher score indicates a greater use of alcohol.

b) asks respondents how often they have used drugs (marijuana, inhalants, sedatives, hallucinogens and cocaine) in the previous 12 months; scores range from 0–20 with a high score indicating greater drug use.

3.3.9 Resilience and wellbeing

Resilience

Resilience refers to the capacity of AGYW, in a context of adversity, to navigate their way to the psychological, social and cultural resources they require to sustain their wellbeing. Overall resilience scores were high among all AGYW with a mean of 51.4 (Range: 12–60, see Table 17).

Table 17 : Resilience among AGYW 12–24 years old for the AGYW Study 2018

	Ekurhuleni & the COJ (GP)		uMgungundlovu & eThekweni (KZN)		Consolidated	
	M(SD)	n	M(SD)	n	M(SD)	n
Resilience^a						
12–14 years	51.3(10.4)	2 350	53.3(9.0)	1 820	52.0(10.0)	4 170
15–19 years	50.6(10.7)	3 992	53.1(9.3)	3 006	51.5(10.3)	6 998
20–24 years	50.4(11.1)	4 042	52.8(9.5)	3 086	51.1(10.7)	7 128
Total	50.6(10.8)	10 384	53.0(9.4)	7 912	51.4(10.4)	18 296

Notes: Weighted means reported; M = Mean; SD = Standard Deviation. Abbreviations: COJ=City of Johannesburg, GP=Gauteng, KZN=KwaZulu-Natal, AGYW=Adolescent Girls and Young Women a) is the CYRM-12 scale, values range from 12–60, a high score means greater resilience.

Wellbeing

Overall, depression symptoms appear to present infrequently in this sample of AGYW with a mean of 1.2 (Range: 0–15, see Table 18). Depressive symptoms appear to be slightly more prevalent in Gauteng than in KZN (M = 1.3 vs. 0.8, $p < 0.001$, respectively). Young women in Gauteng, aged 20–24 years old, were slightly more likely to have depressive symptoms than young women 12–14 years (M = 1.6 vs. 0.8, $p < 0.001$ respectively).

Table 18: Wellbeing among AGYW 12–24 years old for the AGYW Study 2018

	Ekurhuleni & the COJ (GP)		uMgungundlovu & eThekweni (KZN)		Consolidated	
	M(SD)	n	M(SD)	n	M(SD)	n
Depression symptoms^a						
12–14 years	0.8(1.8)	2 350	0.4(1.3)	1 818	0.7(1.6)	4 168
15–19 years	1.4(2.4)	3 992	0.7(1.7)	2 999	1.1(2.2)	6 991
20–24 years	1.6(2.6)	4 042	1.1(2.1)	3 076	1.4(2.5)	7 118
Total	1.3(2.4)	10 384	0.8(1.8)	7 893	1.2(2.3)	18 277

Notes: Weighted means reported; M = Mean; SD = Standard Deviation a) is the five-item version of the CES-D; values range from 0–15 with a higher score indicating greater levels of depression symptoms. Abbreviations: COJ=City of Johannesburg, GP=Gauteng, KZN=KwaZulu-Natal, AGYW=Adolescent Girls and Young Women.

3.3.10 Contraceptive use

Overall, 30.7% of AGYW indicated they were using contraceptives (Table 19). In Gauteng, 48.7% of young women aged 20–24 years old and 23.4% of adolescent girls aged from 15–19 years old were using contraceptives. In KZN, more than half (52%) of AGYW 20–24 years old and 21.4% of adolescent girls 15–19 years old were using contraceptives. Of those AGYW who used contraceptives, the highest proportion (40.6%) used the Depo-provera injection, just over one third (33.8%) used male condoms and 20.8% used the Nuristerate injection as the main type of contraception (*data not shown here*).

Contraceptive use is also presented for the 8 414 (49.9%) of AGYW who reported to have had sex. The data highlight that 54.6% of sexually active AGYW reported currently using contraceptives. In Gauteng, just over half (53.3%) of sexually active AGYW were using contraceptives and in KZN, 57.1% of sexually active AGYW were using contraceptives. Just over one quarter of adolescents aged 12–14 years olds in Gauteng were using contraceptives, whereas 12.8% of adolescents aged 12–14 years old in KZN were using contraceptives.

Table 19: Contraceptive use of AGYW 12–24 years old for the AGYW Study 2018

	Ekurhuleni & the COJ (GP)		uMgungundlovu & eThekweni (KZN)		Consolidated	
	%	n	%	n	%	n
Currently using contraceptives (Yes)						
12–14 years	1.6	38	0.4	8	1.2	46
15–19 years	23.4	938	21.4	628	22.7	1 566
20–24 years	48.7	1 968	52.0	1 578	49.8	3 546
Total	30.8	2 944	30.4	2 214	30.7	5 158
Currently using contraceptives* (Yes)						
12–14 years	25.2	14	12.8	4	21.7	18
15–19 years	49.0	800	50.2	565	49.4	1 365
20–24 years	55.5	1 716	60.5	1 458	57.2	3 174
Total	53.3	2 530	57.1	2 027	54.6	4 557

Notes: Weighted percentage reported. *Sexually active only. Abbreviations: COJ=City of Johannesburg, GP=Gauteng, KZN=KwaZulu-Natal, AGYW=Adolescent Girls and Young Women

3.3.11 Gender-based violence

Relationship power

Women in relationships with a power imbalance — defined as male decision-making dominance, the inability to engage in behaviours against their male partner's wishes or the inability to control their male partners actions — are more likely to report recent and previous partner violence^{[63] [64]}. With this in mind, we assessed the level of sexual relationship power for those AGYW who are currently in relationships. The sexual relationship power scale results highlight that on average most AGYW experienced substantial freedom in their relationships (M= 12.6, Range: 0–15). The age-disaggregated results for the sexual relationship power scale highlighted that young adolescents (12–14 years old) experienced less control in their relationship than women aged 20–24 years old in Gauteng (M= 13.9 vs. 12.2, $p < 0.001$, respectively) and KZN (M = 14.2 vs. 12.4, $p < 0.001$, respectively).

Table 20: Relationship power of AGYW 12–24 years old from the AGYW Study in 2018

	Ekurhuleni & the COJ (GP)		uMgungundlovu & eThekweni (KZN)		Consolidated	
	M(SD)	n	M(SD)	n	M(SD)	n
Relationship power						
12–14 years	13.9(4.1)	348	14.2(4.1)	139	13.9(4.1)	487
15–19 years	12.8(4.0)	2 478	13.0(4.0)	1 671	12.8(4.0)	4 149
20–24 years	12.2(4.2)	3 486	12.4(4.0)	2 627	12.3(4.1)	6 113
Total	12.5(4.1)	6 312	12.6(4.0)	4 437	12.6(4.1)	10 749

Notes: Weighted means reported. M = Mean; SD = Standard Deviation; a) is the Sexual Relationship Power Scale and measures subjective experiences of power imbalances in an intimate partnership. Scores range from 0–15; a higher score indicates greater freedom in the relationship. Individuals who were not currently in a relationship or had never been in a relationship were excluded. In a relationship refers to someone the participant is currently dating casually or seriously. Abbreviations: COJ=City of Johannesburg, GP=Gauteng, KZN=KwaZulu-Natal, AGYW=Adolescent Girls and Young Women

Intimate partner and non-partner violence

In this study we measured physical and sexual IPV by using the World Health Organization's Intimate Partner Violence behavioural measure which has been adapted for a South African context^{[65] [66]}. Only AGYW who indicated they had a boyfriend were included in this analysis. Sexual IPV includes being raped, forced or persuaded to have sex with an intimate partner, and physical IPV includes physically violent practices (being kicked, shoved, pushed, hit with a fist or threatened with a gun or weapon) perpetrated against them by their intimate partner. Non-partner violence included rape and attempted rape.

Overall, just less than half (47.9%) of AGYW had ever had a boyfriend. By age 14 years of age 10.3% of AGYW had ever had a boyfriend, nearly half (46.2%) of 15–19-year-olds had ever had a boyfriend and approximately two-thirds (65.2%) of 20–24-year-olds had ever had a boyfriend. Thirteen per cent of AGYW who were in a relationship reported experiencing physical IPV in the previous 12 months from their partner. In Gauteng, 14.1% of AGYW experienced physical IPV, whereas in KZN, 10.9% experienced physical IPV in the previous 12 months. Young adolescents (12–14 years old) were less likely to report experiencing physical IPV in the previous 12 months than young women (20–24 years old) in Gauteng (5.7% vs. 15.8%, respectively) and KZN (6.4% vs 12.3%, respectively). A lower proportion of AGYW had reported experiencing sexual IPV in the previous 12 months (4.5%). In Gauteng, 5.4% of AGYW reported experiencing sexual IPV and 2.7% in KZN experienced sexual IPV in the previous 12 months.

More than one-tenth (14.8%) of AGYW reported experiencing sexual or physical IPV in the previous 12 months. In Gauteng, 16.4% of AGYW reported experiencing sexual or physical IPV and in KZN, 11.5% reported experiencing sexual or physical IPV in the previous 12 months. Young women aged 20–24 years old had the highest prevalence (Gauteng: 18.4% and KZN: 13.0%) of sexual or physical IPV while younger adolescents aged 12–14 years old (Gauteng: 6.9% and KZN: 6.4%) had the lowest prevalence of sexual or physical IPV in the previous 12 months.

Overall, 4.6% of all AGYW reported experiencing sexual violence from someone who they were not in a relationship with (not their partner) in the previous 12 months. In Gauteng 5.3% reported experiencing sexual violence in the previous 12 months from someone who was not their partner, while in KZN 3.1% reported experiencing sexual violence from someone who was not their partner. Young adolescents (12–14 years old) were less likely to report experiencing sexual violence from someone who is not their partner than young women (20–24 years old) in Gauteng (1.7% vs. 6.7%, respectively) and KZN (1.3% vs. 4.5%, respectively).

Table 21: Intimate partner and non-partner violence among AGYW 12–24 years old from the AGYW Study 2018

	Ekurhuleni & the COJ (GP)		uMgungundlovu & eThekweni (KZN)		Consolidated	
	%	n	%	n	%	n
Physical IPV in the past year (Yes)						
12–14 years	5.7	17	6.4	6	5.8	23
15–19 years	12.3	229	8.7	107	11.1	336
20–24 years	15.8	403	12.3	243	14.6	646
Total	14.1	649	10.9	356	13.0	1 005
Sexual IPV in the past year (Yes)						
12–14 years	3.6	10	1.6	1	3.2	11
15–19 years	3.9	73	2.4	30	3.4	103
20–24 years	6.4	163	2.9	65	5.2	228
Total	5.4	246	2.7	96	4.5	342
Physical or sexual IPV in the past year (Yes)						
12–14 years	6.9	20	6.4	6	6.8	26
15–19 years	14.2	264	9.4	116	12.6	380
20–24 years	18.4	468	13.0	260	16.6	728
Total	16.4	752	11.5	382	14.8	1 134
Non-partner sexual violence in the past year (Yes)						
12–14 years	1.7	38	1.3	23	1.6	61
15–19 years	5.3	216	2.4	70	4.3	286
20–24 years	6.7	271	4.5	136	6.0	407
Total	5.3	525	3.1	229	4.6	754

Notes: Weighted percentage reported. Abbreviations: COJ=City of Johannesburg, GP=Gauteng, KZN=KwaZulu-Natal, AGYW=Adolescent Girls and Young Women

3.3.12 HIV

HIV testing coverage

Table 22 indicates self-reported HIV testing patterns among AGYW: 67.0% indicated they have “ever tested” for HIV. Testing coverage was 63.8% in Gauteng and 73.4% in KZN. More than a quarter (29.8%) of adolescent girls (aged 12–14 years old) had tested previously for HIV in Gauteng, whereas 46.6% of girls in the same age group in KZN had tested for HIV. In Gauteng most (82.6%) of young women (20–24 years old) had tested for HIV. Slightly more young women (aged 20–24 years old) in KZN had tested for HIV previously (88.5%). Of those who had tested, just less than two-thirds (61.3%) of AGYW had their HIV test in the previous 6 months and approximately a quarter (24.5%) had tested for HIV in the previous 7 to 12 months. Nearly two-thirds (61.9%) of young adolescents (12–14 years old) in Gauteng had their most recent HIV test in the previous 6 months. Just over half (52.6%) of young adolescents in KZN had their previous HIV test in the past 6 months. The single most important reason for not testing for HIV reported by participants was that they believed that they did not have HIV (30%) (*data not presented*).

Table 22: HIV testing coverage among AGYW 12–24 years old from the AGYW Study 2018

	Ekurhuleni & the COJ (GP)		uMgungundlovu & eThekweni (KZN)		Consolidated	
	%	n	%	n	%	n
Ever had an HIV test (Yes)						
12–14 years	29.8	705	46.6	820	35.7	1 525
15–19 years	57.7	2 317	70.2	2 047	62.1	4 364
20–24 years	82.6	3 325	88.5	2 695	84.6	6 020
Total	63.8	6 347	73.4	5 562	67.0	11 909
Indicated 0–6 months since previous HIV test						
12–14 years	61.9	439	52.6	418	57.6	857
15–19 years	63.8	1 491	58.1	1 174	61.6	2 665
20–24 years	63.0	2 106	59.4	1 555	61.8	3 661
Total	63.2	4 036	58.0	3 147	61.3	7 183
Indicated 7–12 months since previous HIV test						
12–14 years	25.9	176	25.1	218	25.5	394
15–19 years	24.6	559	25.3	534	24.9	1 093
20–24 years	23.9	793	24.5	692	24.5	1 485
Total	24.3	1 528	25.0	1 444	24.5	2 972

Notes: Weighted percentage reported. Abbreviations: COJ=City of Johannesburg, GP=Gauteng, KZN=KwaZulu-Natal, AGYW=Adolescent Girls and Young Women

HIV incidence

HIV incidence is the number of new HIV infections in a population during a certain time period. The determination of annual HIV incidence in a population is important to monitor an epidemic. Annual HIV incidence measures can also be used to assess the effectiveness of an intervention or combination of interventions that seek to reduce the number of new infections. The study used a recent infection algorithm (RITA) that was a combination of a biological measure of recent infections and post-laboratory testing modifications.

The overall estimated incidence for the two provinces in the 12–24 age group was 0.72% (95% CI: 0.65–0.79). The annual incidence by province was 0.72% (95% CI 0.65–0.80) for Gauteng and 0.71% (95% CI 0.64–0.78) in KZN. There was no overall difference in incidence between the provinces (see Table 24). There were differences in incidence by specific age bands and by province. Incidence was lower overall in 15–19-year age group (0.65%, 95% CI: 0.59–0.72) as compared to the 20–24 age group (1.07%, 95% CI: 0.97–1.18). The incidence in the 15–19-year age band was 0.75% (95% CI: 0.68–0.83%) in Gauteng and 0.46% (95% CI: 0.41–0.50) in KZN. For the 20–24 age band the incidence was 0.94% (95% CI 0.85–1.04) for Gauteng and 1.38% (95% CI 1.24–1.52) in KZN.

Table 23: HIV incidence for AGYW 12–24 years old from the AGYW Study 2018

	Ekurhuleni & the COJ (GP)		uMgungundlovu & eThekweni (KZN)		Consolidated	
	n	HIV Incidence % (95% CI)	n	HIV Incidence % (95% CI)	n	HIV Incidence % (95% CI)
Age disaggregation by adolescents and youth						
15–19 years	3 992	0.75 (0.68–0.83)	3 006	0.46 (0.41–0.50)	6 998	0.65 (0.59–0.72)
20–24 years	4 042	0.94 (0.85–1.04)	3 086	1.38 (1.24–1.52)	7 128	1.07 (0.97–1.18)
Age excluding young adolescents						
15–24 years	8 034	0.86 (0.77–0.94)	7 912	0.91 (0.82–0.99)	15 946	0.87 (0.79–0.96)
Overall						
12–24 years	10 384	0.72 (0.65–0.80)	7 912	0.71 (0.64–0.78)	18 296	0.72 (0.65–0.79)

Notes: Weighted percentage reported. Abbreviations: COJ=City of Johannesburg, GP=Gauteng, KZN=KwaZulu-Natal, AGYW=Adolescent Girls and Young Women; CI=Confidence Interval

HIV prevalence

There were 18 245 AGYW enrolled and tested for HIV in the full sample. Approximately one-tenth (10.4%; n=1 892) were serologically HIV positive. Table 24 shows that the HIV prevalence was higher in KZN (15.1%, 95% CI: 14.2–16.1) than in Gauteng (7.8%, 95% CI: 7.2–8.5%). HIV prevalence was at its lowest (2.5%) among 12 to 14-year olds in Gauteng and highest (23.9%) among 20 to 24-year olds in KZN.

Table 24: HIV prevalence for AGYW 12–24 years old from the AGYW Study 2018

	Ekurhuleni & the COJ (GP)		uMgungundlovu & eThekweni (KZN)		Consolidated	
	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n
HIV prevalence						
12–14 years	2.5 (1.9–3.2)	60	4.6 (3.9–6.4)	83	3.4 (2.9–4.0)	143
15–19 years	5.0 (4.4–5.7)	200	10.2 (9.0–11.5)	305	7.2 (6.6–7.9)	505
20–24 years	12.3 (11.2–13.4)	501	23.9 (22.3–25.7)	743	17.5 (16.7–18.4)	1 244
Total	7.8(7.2–8.4)	761	15.1 (14.1–16.0)	1 131	10.4 (9.9–10.8)	1 892

Notes: Weighted percentage reported. Abbreviations: COJ=City of Johannesburg, GP=Gauteng, KZN=KwaZulu-Natal, AGYW=Adolescent Girls and Young Women; CI=Confidence Interval

HIV prevalence by select socio-demographic characteristics

Table 25 shows HIV prevalence by select sociodemographic characteristics. HIV prevalence was higher for those 18 years or younger who were currently not attending (8.4%, 95% CI: 6.7–10.5) school, compared with 4.7% (95% CI: 4.2–5.2) of those in school. Overall, HIV prevalence was 7.9% (95% CI: 6.4–9.7) for those who reported they were currently repeating a grade, compared with 5.6% (95% CI: 5.1–6.1) for those not repeating a grade. In KZN, those who reported they were currently repeating a grade had an HIV prevalence of 15.0% (95% CI: 11.6–19.2) compared to an HIV prevalence of 8.4% (95% CI: 7.5–9.4) for those who were not repeating a grade. HIV prevalence was lower for those who completed tertiary education (8.9%, 95% CI: 7.7–10.3) and higher for those who completed only grade R to Grade 7 (25.6%, 95% CI: 17.9–35.3). Those who indicated they were single had a lower HIV prevalence (6.3%, 95% CI: 5.8–6.9) than those who were dating and cohabiting (18.0%, 95% CI: 15.0–21.4). Additionally, those who were single also had a lower prevalence than those who were dating and not cohabiting (13.1%, 95% CI: 12.4–14.0).

Table 25: HIV prevalence by select socio-demographic characteristics for AGYW 12–24 years old in the AGYW Study 2018

	Ekurhuleni & COJ (GP)		uMgungundlovu & eThekweni (KZN)		Consolidated	
	HIV Prevalence	n	HIV Prevalence	n	HIV Prevalence	n
	% (95% CI)		% (95% CI)		% (95% CI)	
Are you currently in school? (≤ 18 years old)						
No	6.4 (4.5–9.0)	566	12.1 (8.9–16.1)	440	8.4 (6.7–10.5)	1 006
Yes	3.5 (3.0–4.1)	4 912	6.8 (5.9–7.8)	3 736	4.7 (4.2–5.2)	8 648
Are you currently repeating a grade?						
No	4.1 (3.6–4.7)	5 658	8.4 (7.5–9.4)	4 421	5.6 (5.1–6.1)	10 079
Yes	4.9 (3.5–6.9)	629	15 (11.6–19.2)	363	7.9 (6.4–9.7)	992
Highest education						
No schooling	12.4 (8.6–17.6)	270	23.4 (17.3–30.8)	167	15.5 (12.1–19.6)	437
Grade R to 7	17.1 (9.9–28.0)	73	57.7 (38.3–75.0)	30	25.6 (17.9–35.3)	103
Grade 8 to 12	13 (11.8–14.4)	3 134	24.9 (23.0–26.8)	2 423	16.9 (15.9–18.0)	5 557
Tertiary studies complete/ incomplete	6.5 (5.2–8.2)	1 146	15 (12.5–17.9)	735	8.9 (7.7–10.3)	1 881
Current relationship status						
Single (not in a relationship)	5.3 (4.7–6.0)	4 972	8.3 (7.3–9.4)	388	6.3 (5.8–6.9)	5360
Dating someone (in a relationship, but not living together)	9.2 (8.4–10.2)	4 742	20.2 (18.8–21.7)	3 844	13.1 (12.4–14.0)	8 586
Dating and living together, not married (living with boyfriend/girlfriend/partner)	15 (12.0–18.6)	508	40.3 (29.3–52.4)	97	18.0 (15.0–21.4)	605
Engaged	9.2 (3.4–22.4)	44	37.8 (20.3–59.2)	23	17.8 (10.4–28.8)	67
Married (not living with husband/wife)	19.4 (6.3–46.5)	18	38.2 (10.9–75.7)	9	24.4 (10.6–46.7)	27
Married (currently living with husband/wife)	9.5 (4.5–19.1)	67	10.6 (2.5–35.1)	24	9.8 (5.0–18.1)	91
Divorced / separated	22 (3.0–71.9)	5	26.6 (4.0–75.9)	6	23.9 (6.2–59.9)	11
Widowed	0	1	69.6 (35.0–90.7)	3	50.9 (19.1–82.0)	4

Notes: Weighted percentages reported. Abbreviations: COJ=City of Johannesburg, GP=Gauteng, KZN=KwaZulu-Natal, AGYW=Adolescent Girls and Young Women, CI=Confidence Interval

HIV prevalence by select behavioural characteristics

Table 26 shows HIV prevalence by selected self-reported behavioural characteristics. The AGYW who indicated in the previous 12 months that they had a sexual partner who was 5 or more years or older than them had a higher HIV prevalence (18.0%, 95% CI: 16.5–19.7) than those who indicated that in the past 12 months they did not have a partner who was 5 or more years older than them (12.9%, 95% CI: 12.0–13.9). Those who indicated they had not used a condom the first time they had sex had a higher HIV prevalence (18.4%, 95% CI: 17.1–19.9) than those who indicated they had used a condom the first time they had sex (11.9%, 95% CI: 10.9–13.0). In Gauteng, those who used condoms at first sex appear to be less likely to contract HIV than those who did not use condom at first sex (9.2% vs. 13.6%, respectively). On the other hand, there does not appear to be a difference in HIV prevalence between those who used condoms at first sex and those who do not use condom at first sex in KZN (22.2% vs. 23.4%, respectively). Those who reported that they always used condoms during sex in the previous 12 months had an HIV prevalence of 10.4% (95% CI: 8.9–12.1) compared to those who indicated never using condoms during sex in the previous 12 months who had an HIV prevalence of 14.6% (95% CI: 13.3–15.9). HIV prevalence was lower (13.4%, 95% CI: 12.5–14.4) in those reporting having circumcised partners compared to those whose partners were not circumcised (18.6%, 95% CI: 16.7–20.7). More than a quarter (27.7%, 95% CI: 23.1–32.8) of those AGYW who reported six or more sex partners in their lifetime were HIV positive.

Table 26: HIV prevalence by selected sexual behaviour characteristics for AGYW 12–24 years old in the AGYW Study 2018

	Ekurhuleni & the COJ (GP)		uMgungundlovu & eThekweni (KZN)		Consolidated	
	HIV prevalence % (95% CI)	n	HIV prevalence % (95% CI)	n	HIV prevalence % (95% CI)	n
In the past 12 months have any of your sexual partners been five or more years older?						
No	9.0 (8.0–10.1)	3 152	20.2 (18.5–21.9)	2 539	12.9 (12.0–13.9)	5 691
Yes	13.3 (11.6–15.3)	162	30.0 (26.7–33.5)	963	18.0 (16.5–19.7)	1 125
Total	10.5 (9.5–11.6)	4 772	22.9 (21.4–24.5)	3 502	14.6 (13.7–15.4)	8 274
How often have you used condoms in the last 12 months when you had sex?						
Always	7.6 (6.2–9.4)	1 126	19.6 (16.0–23.8)	503	10.4 (8.9–12.1)	1 629
Often	11.3 (8.7–14.6)	526	22.7 (18.5–27.7)	371	14.9 (12.6–17.6)	897
Sometimes	12.3 (10.6–14.3)	1 505	26.6 (24.0–29.2)	1 165	17.1 (15.6–18.7)	2 670
Never	10.5 (9.1–12.2)	1 615	21.2 (19.0–23.6)	1 463	14.6 (13.3–15.9)	3 078
The first time you had sex did you use a condom?						
No	13.6 (11.7–15.7)	1 492	23.4 (21.4–25.5)	2 176	18.4 (17.1–19.9)	3 668
Yes	9.2 (8.1–10.3)	3 247	22.2 (19.8–24.7)	1 304	11.9 (10.9–13.0)	4 551
Refused	5.5 (0.8–29.8)	33	17.1 (5.3–43.3)	22	9.8 (3.5–24.5)	55
Total	10.5 (9.5–11.6)	4 772	22.9 (21.4–24.5)	3 502	14.6 (13.7–15.4)	8 274
Was your sexual partner circumcised?						
No	13.5 (11.3–16.0)	936	27 (23.8–30.5)	856	18.6 (16.7–20.7)	1 792
Yes	10.0 (8.9–11.1)	3 459	21.3 (19.6–23.0)	2 324	13.4 (12.5–14.4)	5 783
Don't know	8.2 (5.8–11.5)	377	23.5 (18.8–28.8)	322	14.0 (11.5–16.9)	699
Total	10.5 (9.5–11.6)	4 772	22.9 (21.4–24.5)	3 502	14.6 (13.7–15.4)	8 274
Total amount of sexual partners in lifetime						
0	9.4 (6.6–13.1)	326	16.5 (12.0–22.2)	221	11.5 (9.1–14.5)	547
1	8.7 (7.6–10.0)	2 644	20.3 (18.4–22.2)	2 025	12.6 (11.7–13.7)	4 669
2–5	11.9 (10.2–13.8)	1 573	27 (24.4–29.8)	1 091	16.7 (15.2–18.2)	2 664
6+	23.2 (17.7–29.8)	229	37.8 (29.9–46.4)	165	27.7 (23.1–32.8)	394
Total	10.5 (9.5–11.6)	4 772	22.9 (21.4–24.5)	3 502	14.6 (13.7–15.4)	8 274

Notes: Weighted percentage reported. Abbreviations: COJ=City of Johannesburg, GP=Gauteng, KZN=KwaZulu-Natal, AGYW=Adolescent Girls and Young Women, CI=Confidence Interval

Treatment cascade

The UNAIDS fast track targets include: 90% of those who are HIV positive know their HIV status, 90% of all people diagnosed with HIV initiated onto ART, and 90% of those receiving sustained ART virally suppressed (less than 1000 copies per millilitre). This section assesses the progress on reaching these targets.

Less than two-thirds (62.0%) of HIV-positive AGYW knew their status. Just over half (55.5%) of the AGYW in Gauteng knew their HIV status, while two-thirds (67.3%, 95% CI: 64.3–70.2) of the HIV-positive AGYW in KZN knew their status. The majority (87.0%) of AGYW who knew they were positive, tested positive for ARVs. Most young women aged 20–24 years old who knew their status tested positive for ARVs (86.7%) in Gauteng (82.4%, 95% CI: 91.8–97.4) and in KZN (88.7%, 95% CI: 85.1–91.5). The majority (90.5%) of AGYW (12–24 years old) who tested positive for ARVs were virally suppressed.

Table 27: AGYW Treatment Cascade for AGYW 12–24 years old in the AGYW Study 2018

	Ekurhuleni & the COJ (GP)		uMgungundlovu & eThekwini (KZN)		Consolidated	
	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n
Know they are HIV positive						
12–14 years	47.6 (35.0–60.5)	28	73.8 (63.1–82.3)	60	61.5	88
15–19 years	62.9 (55.6–69.6)	123	59.5 (53.3–65.3)	180	60.1	303
20–24 years	53.7 (49.2–58.2)	270	69.7 (66.0–73.1)	509	62.8	779
Total	55.5 (51.8–59.2)	421	67.3 (64.3–70.2)	749	62.0	1 170
On ARV treatment						
12–14 years	90.1 (72.7–96.9)	25	96.6 (86.8–99.2)	58	94.3	83
15–19 years	88.2 (81.0–92.9)	108	89.6 (83.9–93.4)	161	88.8	269
20–24 years	82.4 (77.2–86.7)	223	88.7 (85.1–91.5)	451	86.7	674
Total	84.4 (80.3–87.7)	356	89.5 (86.8–91.7)	670	87.0	1 026
Virally suppressed <1000 copies/mL						
12–14 years	59.4 (38.9–77.0)	15	80.8 (66.4–90.0)	48	75.9	63
15–19 years	83.1 (74.2–89.4)	90	90.0 (84.1–93.9)	146	87.7	236
20–24 years	95.4 (91.8–97.4)	212	92.3 (89.3–94.5)	418	93.5	630
Total	90.0 (86.2–92.9)	317	90.9 (88.4–92.9)	612	90.5	929

Notes: Weighted percentage reported * includes self-reported knowledge of HIV+ status and AGYW who tested positive for ARV, Abbreviations: COJ=City of Johannesburg, GP=Gauteng, KZN=KwaZulu-Natal, AGYW=Adolescent Girls and Young Women

3.3.13 Sexually transmitted infections and Pregnancy

Sexually transmitted infections

Table 28 highlights the prevalence of self-reported sexually transmitted infections (STI) among sexually active AGYW (AGYW who reported to have ever had sex). AGYW were asked if they had ever been diagnosed with an STI by a health professional. A minority (8.6%) of sexually active AGYW indicated they had previously been diagnosed with a STI. The proportion of AGYW ever diagnosed with STIs were 9.4% in KZN and 8.2% in Gauteng. Similar to the HIV prevalence findings, the 20–24-year-old young women from KZN had the highest STI prevalence (10.5%), while young adolescents 12–14 years old in KZN had the lowest prevalence (4.0%). In Gauteng, young adolescents (12–14 years old) had an STI prevalence of 7.2% and young women (20–24 years old) had an STI prevalence of 9.0%.

Table 28: Sexually transmitted infections among AGYW 12–24 years old in the AGYW Study 2018

	Ekurhuleni & the COJ (GP)		uMgungundlovu & eThekwini (KZN)		Consolidated	
	%	n	%	n	%	n
Has a doctor or nurse ever told you that you have a sexually transmitted infection? (Yes)						
12–14 years	7.2	5.0	4.0	2	6.4	7
15–19 years	6.6	105	6.8	70	6.6	175
20–24 years	9.0	277	10.5	228	9.5	505
Total	8.2	387	9.4	300	8.6	687

Notes: Weighted percentage reported. Abbreviations: COJ=City of Johannesburg, GP=Gauteng, KZN=KwaZulu-Natal, AGYW=Adolescent Girls and Young Women

Pregnancy

Of AGYW who reported ever engaging in sexual activity, just more than half (55.5%) reported having ever been pregnant (see Table 29). Just more than half (51%) of the AGYW in Gauteng said they had ever been pregnant. In KZN, just less than two-thirds (64%) of AGYW indicated they had ever been pregnant. In KZN, among young women (aged 20–24 years old) 71.6% had ever been pregnant whereas in Gauteng 60.8% of young women (aged 20–24 years old) had ever been pregnant. A similar provincial trend was found for 15–19-year-old adolescents as 47.9% in KZN had ever been pregnant and 30.5% of 15–19-year-old adolescents in Gauteng had

ever been pregnant. Of concern, 8.6% of young adolescents (12–14 years) in Gauteng and 12.7% in KZN reported having ever been pregnant.

Table 29: AGYW prevalence of pregnancy for AGYW 12–24 years old in the AGYW Study 2018

	Ekurhuleni & the COJ (GP)		uMgungundlovu & eThekweni (KZN)		Consolidated	
	%	n	%	n	%	n
Have you ever been pregnant? (Yes)						
12–14 years	8.6	6	12.7	5	9.8	11
15–19 years	30.5	494	47.9	516	36.3	1 010
20–24 years	60.8	1 848	71.6	1 665	64.4	3 513
Total	51.0	2 348	64.0	2 186	55.5	4 534

Notes: Weighted percentage reported. *Only AGYW who had had sex answered this question. Abbreviations: COJ=City of Johannesburg, GP=Gauteng, KZN=KwaZulu Natal, AGYW=Adolescent Girls and Young Women

3.3.14 HIV prevention interventions and outcomes

HIV prevention interventions

This section presents data on attendance or participation in HIV prevention interventions. Overall, just less than a quarter (23.7%) of AGYW had participated in a support group programme where people of the same age met (see Table 30). Just less than half (47.4%) of AGYW had been exposed to sexuality education at school in the previous 12 months. Older adolescents (15–19 years old) were more likely to have been exposed to sexuality education than young women (20–24 years old): in Gauteng (56.4% vs. 31.9%, respectively) and KZN (59.5% vs. 38.5%, respectively). Sexuality education mostly occurs at school; therefore most AGYW currently attending school will be exposed to sexuality education.

Nearly half (44.5%) of all AGYW received training or education in the previous 12 months on how to use condoms. Just less than half (49.6%) of AGYW in KZN attended condom training and 41.9% in Gauteng attended condom training. Older adolescents (15–19 years old) were more likely to attend condom training than young women (20–24 years old) in Gauteng (49.2% vs. 34.2%, respectively) and KZN (55.9% vs. 44.2%).

Approximately half (48.1%) of all AGYW indicated they had received education or training on the benefits of HIV testing in the previous 12 months. More than a third (35.6%) of AGYW indicated they had been exposed to contraceptive use training or education. AGYW in KZN were more likely to be exposed to a contraceptive use education or training campaign than AGYW from Gauteng (40.6% vs. 33.0%). Young women (20–24 years old) were more likely to be exposed to contraceptive use training and education than young adolescents in Gauteng (24.2% vs. 35.7%, respectively) and KZN (27.9% vs. 46.4%). Approximately five percent (4.8%) of AGYW have received money from a programme to stay in school. More young women (20–24 years old) reported they received money to stay in school than young adolescents (12–14 years old) in Gauteng (14.3% vs. 2.2%, respectively) and KZN (11.2% vs. 1.4%, respectively).

Table 30: HIV prevention interventions for AGYW 12–24 years old in the AGYW Study 2018

	Ekurhuleni & the COJ (GP)		uMgungundlovu & eThekweni (KZN)		Consolidated	
	%	n	%	n	%	n
Participated in support group programmes in which people your age meet? (Yes)						
12–14 years	25.0%	593	26.0%	460	25.4%	1 053
15–19 years	24.9%	993	25.0%	764	24.9%	1 757
20–24 years	21.4%	874	23.0%	698	21.9%	1 572
Total	23.4%	2 460	24.3%	1 922	23.7%	4 382
Attended sexuality education at school in past 12 months (1+ times)						
12–14 years	59.3%	969	58.9%	737	59.2%	1076
15–19 years	56.4%	1 762	59.5%	1 211	57.5%	2973
20–24 years	31.9%	2 752	38.5%	1 883	34.0%	4635
Total	45.8%	5 483	50.4%	3 831	47.4%	9314
Attended condom training/education in past 12 months (1+ times)						
12–14 years	46.3%	1 074	49.2%	908	47.3%	1 982
15–19 years	49.2%	1 960	55.9%	1 673	51.6%	3 633
20–24 years	34.2%	1 392	44.2%	1 374	37.5%	2 766
Total	41.9%	4 426	49.6%	3 955	44.5%	8 381
Benefit of HIV testing training/education in past 12 months (1+ times)						
12–14 years	35.7%	830	44.5%	814	38.8%	1 644
15–19 years	47.6%	1 895	55.6%	1 655	50.4%	3 550
20–24 years	46.9%	1 898	56.6%	1 730	50.1%	3 628
Total	45.1%	4 623	53.9%	4 199	48.1%	8 822
Contraceptive use training/education in past 12 months (1+ times)						
12–14 years	24.2%	567	27.9%	525	25.5%	1 092
15–19 years	34.3%	1 374	40.5%	1 216	36.5%	2 590
20–24 years	35.7%	1 445	46.4%	1 416	39.2%	2 861
Total	33.0%	3 386	40.6%	3 157	35.6%	6 543
Ever receive money from a programme to stay in school (Yes)						
12–14 years	2.2%	57	1.4%	26	1.9%	83
15–19 years	4.0%	121	2.6%	60	3.5%	181
20–24 years	14.3%	135	11.2%	84	13.3%	219
Total	5.4%	313	3.7%	170	4.8%	483

Notes: Weighted percentage reported. Abbreviations: COJ=City of Johannesburg, GP=Gauteng, KZN=KwaZulu-Natal, AGYW=Adolescent Girls and Young Women

HIV prevention intervention outcomes

Table 31 presents self-reported data on HIV prevention intervention outcomes among AGYW in the study districts in last 12 months (see Figure 1 for HIV prevention interventions). In this case, outcomes refer to the end result of HIV prevention interventions. There is the possibility that DREAMS implementation partners did not implement these interventions and therefore the outcomes may not only be affected by a DREAMS intervention or programme.

More than one-tenth (11.5%) of AGYW had heard of pre-exposure prophylaxis (PrEP). Young women (20–24 years old) were more likely to have heard of PrEP than adolescent girls (12–14 years old) in Gauteng (14.6% vs. 5.1%, respectively) and in KZN (17.2% vs. 3.5%, respectively). Of those AGYW who indicated they have heard of PrEP, approximately a tenth (10.8%, n=160) of AGYW indicated they had used PrEP within the past year.

Over half (54.7%) of the AGYW indicated they knew of a place where they felt comfortable accessing free condoms. Approximately half (51.0%) of AGYW in Gauteng knew of a place they felt comfortable accessing

free condoms, whereas 61.8% of AGYW in KZN indicated they knew of a place where they felt comfortable accessing free condoms. The majority (65.7% in Gauteng and 75.7% in KZN) of young women (20–24 years old) knew of a place that they felt comfortable accessing free condoms, whereas only a minority of young adolescents (12–14 years old) knew of a place that they felt comfortable accessing free condoms (24.8% in Gauteng and 37.6% in KZN).

Just over a third (35.2%) of AGYW obtained free condoms in the previous 12 months. Young women (20–24 years old) were more likely to obtain free condoms than young adolescents (12–14 years old): in Gauteng (39.2% vs. 22.4%, respectively) and KZN (44.2% vs. 26.5%).

Nearly two-thirds (64.5%) of AGYW indicated that the health workers at their nearest health facility were friendly towards them. A higher proportion (74.7%) of AGYW in KZN indicated that health workers were friendly at their nearest health facility than in Gauteng (59.1%).

Table 31: HIV prevention intervention outcomes for AGYW 12–24 years old for the AGYW Study 2018

	Ekurhuleni & the COJ (GP)		uMgungundlovu & eThekweni (KZN)		Consolidated	
	%	n	%	n	%	n
Ever heard of PrEP (Yes)						
12–14 years	5.1%	47	3.5%	29	4.5%	76
15–19 years	9.7%	205	9.7%	125	9.7%	330
20–24 years	14.6%	318	17.2%	234	15.4%	552
Total	11.3%	570	11.8%	388	11.5%	958
In the past year have ever used PrEP (Yes)						
12–14 years	8.0%	17	9.2%	6	8.2%	23
15–19 years	9.5%	41	8.5%	12	9.3%	53
20–24 years	12.9%	61	12.4%	23	12.8%	84
Total	10.9%	119	10.5%	41	10.8%	160
Is there somewhere you feel comfortable going to access free condoms? (Yes)						
12–14 years	24.8%	585	37.6%	666	29.3%	1 251
15–19 years	46.2%	1 852	58.6%	1 715	50.6%	3 567
20–24 years	65.7%	2 653	75.7%	2 311	69.0%	4 964
Total	51.0%	5 090	61.8%	4 692	54.7%	9 782
Are the health workers at the nearest health facility friendly to you? (Yes)						
12–14 years	60.8%	1 419	78.4%	1 399	67.0%	2 818
15–19 years	57.9%	2 317	74.4%	2 226	63.7%	4 543
20–24 years	59.5%	2 412	73.4%	2 247	64.1%	4 659
Total	59.1%	6 148	74.7%	5 872	64.5%	12 020
Is there a safe place you can go to regularly to meet with your friends (Yes)						
12–14 years	50.1%	1 170	58.1%	1 032	52.9%	2 202
15–19 years	51.4%	2 048	57.9%	1 723	53.7%	3 771
20–24 years	52.8%	2 129	59.2%	1 812	54.9%	3 941
Total	51.8%	5 347	58.5%	4 567	54.1%	9 914
Obtained free condoms in past 12 months (1+ times)						
12–14 years	22.4%	526	26.5%	492	23.9%	1 018
15–19 years	32.9%	1 317	36.8%	1 114	34.2%	2 431
20–24 years	39.2%	1 580	44.2%	1 387	40.8%	2 967
Total	33.8%	3 423	37.9%	2 993	35.2%	6 416

Notes: Weighted percentage reported. Abbreviations: COJ=City of Johannesburg, GP=Gauteng, KZN=KwaZulu-Natal, AGYW=Adolescent Girls and Young Women

3.4 Caregiver findings

3.4.1 Socio-demographic characteristics

Table 32 highlights the characteristics of AGYW caregivers. The median age of caregivers was 41 years old (IQR: 34–51) and the caregivers were overwhelmingly female (95.6%). Nearly two-thirds (65.1%) of the caregivers that were interviewed were the mothers of AGYW and 13.1% were the maternal grandparents of AGYW. The vast majority (97.8%) identified their race as African and were South African citizens (99.2%). A minority (3.7%) of the sample in Gauteng indicated they consider themselves to be coloured. Nearly a third (32.1%) of the caregivers indicated they were single and a quarter (25.2%) in a relationship but not cohabitating, 7.8% cohabitating, 19.5% legally married and living together; 6.7% were traditionally married and living together, 1.8% were separated or divorced, and 7.1% widowed. A small minority (3.5%) of caregivers indicated they were away from home for more than one consecutive month in the previous 12 months.

Table 32: Socio–demographic characteristics for caregivers of AGYW in the AGYW Study 2018

	Ekurhuleni & the COJ (GP)		uMgungundlovu & eThekweni (KZN)		Consolidated	
	n	%/M	n	%/M	n	%
Age (Median. IQR)	4 652	42 (35–50)	2 835	41 (33–52)	7 487	41 (34–51)
Gender						
Male	160	4.4	125	4.4	285	4.4
Female	3 492	95.6	2 710	95.6	6 202	95.6
What is your race?						
African	3 514	96.2	2 830	99.8	6 344	97.8
Coloured	134	3.7	2	0.1	136	2.1
Asian/Indian	2	0.1	3	0.1	5	0.1
Other	2	0.1	0	0.0	2	0.0
What is your nationality?						
South African citizen	3 609	98.8	2 829	99.8	6 438	99.2
Refugee	10	0.3	3	0.1	13	0.2
Non-citizen (Temporary or Permanent resident)	31	0.8	3	0.1	34	0.5
Other	2	0.1	0	0.0	2	0.0
What is your relationship status?						
Single	1 208	33.1	872	30.8	2 080	32.1
In a relationship and not cohabiting	797	21.8	836	29.5	1 633	25.2
Cohabiting	323	8.8	181	6.4	504	7.8
Legally married and living together	687	18.8	576	20.3	1 263	19.5
Traditionally married and living together	318	8.7	115	4.1	433	6.7
Separated/Divorced	83	2.3	32	1.1	115	1.8
Widowed	236	6.5	223	7.9	459	7.1
In the last 12 months, away from home for more than one consecutive month?						
No	3 508	96.1	2 740	96.6	6 248	96.3
Yes	139	3.8	91	3.2	230	3.5
Refused	5	0.1	4	0.1	9	0.1

Notes: Weighted percentage reported. Abbreviations: COJ=City of Johannesburg, GP=Gauteng, KZN=KwaZulu-Natal, AGYW=Adolescent Girls and Young Women, M=Mean

3.4.2 HIV testing coverage and self-reported HIV prevalence

Table 33 highlights that nearly two-thirds (66.4%) of caregivers had previously been tested for HIV, although more than half (54.9%) of the caregivers who had tested for HIV did so more than 12 months ago. Less than one-fifth (16.8%) of caregivers self-reported testing HIV positive. Of the caregivers in Gauteng who had tested for HIV, 13.9% indicated they were HIV positive and 20.5% of the caregivers in KZN indicated they were HIV positive.

Table 33: Caregiver testing coverage and HIV prevalence in the AGYW Study 2018

	Ekurhuleni & the COJ (GP)		uMgungundlovu & eThekweni (KZN)		Consolidated	
	n	%	n	%	n	%
Have you ever been tested to see if you are HIV positive?						
No	1 133	30.5	817	28.4	1 950	29.6
Yes	2 430	65.4	1 953	67.8	4 383	66.4
Refused	151	4.1	111	3.9	262	4.0
Total	3 714	100	2 881	100	6 595	100
When was the last time that you had an HIV test?						
More than 12 months ago	1312	54.0	1 093	56.0	2 405	54.9
Less than 12 months ago	1091	44.9	829	42.4	1920	43.8
Refused	27	1.1	31	1.6	58	1.3
Total	2403	100	1922	100	4 383	100
What was the result of your latest HIV test?						
HIV Negative	1904	78.4	1 418	72.6	3322	75.8
HIV Positive	337	13.9	401	20.5	738	16.8
Indeterminate	12	0.5	6	0.3	18	0.4
Refused	177	7.3	128	6.6	305	7.0
Total	2430	100	1953	100	4 383	100

Notes: Weighted percentage reported, Abbreviations: COJ=City of Johannesburg, GP=Gauteng, KZN=KwaZulu-Natal, AGYW=Adolescent Girls and Young Women

3.4.3 Parenting practices of caregivers

Table 34 highlights the parenting practices of the caregivers of the AGYW. The majority (60%) of caregivers indicated they always thank or praise the AGYW who are in their care. Approximately half (49.6%) of the caregivers indicated they always spend time doing fun activities together, whereas 7.3% indicated they never do fun things with their AGYW.



Table 34: Parenting practices of caregivers in the AGYW Study 2018

	Ekurhuleni & the COJ (GP)		uMgungundlovu & eThekweni (KZN)		Consolidated	
	n	%	n	%	n	%
I thank or praise the adolescent						
Never	198	5.4	152	5.4	350	5.4
Almost never	47	1.3	24	0.8	71	1.1
Sometimes	495	13.6	401	14.2	896	13.8
Often	631	17.3	644	22.7	1 275	19.7
Always	2276	62.4	1 612	56.9	3 888	60.0
Total	3 647	100	2 833	100	6 480	100
We spend time together doing fun activities together						
Never	281	7.7	195	6.9	476	7.3
Almost never	145	4.0	91	3.2	236	3.6
Sometimes	748	20.5	623	22.0	1 371	21.2
Often	600	16.5	584	20.6	1 184	18.3
Always	1 873	51.4	1 340	47.3	3 213	49.6
Total	3 647	100	2 833	100	6 480	100

Notes: Weighted percentage reported. Abbreviations: COJ=City of Johannesburg, GP=Gauteng, KZN=KwaZulu-Natal, AGYW=Adolescent Girls and Young Women

3.4.4 Caregivers' and AGYWs' discussions on adolescent's sexual activity

Nearly a quarter (23.1%) of caregivers agreed with the statement that they will not answer their AGYW's questions about sexual reproduction and sexuality (Table 35). More than a quarter (28.4%) of caregivers indicated they did not talk to their AGYW about sexual reproduction and sexuality and more than a quarter (26.6%) agree with the statement that they were embarrassed to talk to their AGYW about sex matters. These results are similar across provinces.

Table 35: Caregivers' and AGYWs' discussions on adolescent's sexual activity for the AGYW Study 2018

	Ekurhuleni & the COJ (GP)		uMgungundlovu & eThekweni (KZN)		Consolidated	
	n	%	n	%	n	%
I would NOT answer my adolescents' questions about sex						
Disagree	2 655	72.8	2 138	75.5	4 793	74.0
Agree	890	24.4	605	21.4	1 495	23.1
Refused	102	2.8	90	3.2	192	3.0
Total	3 647	100	2 833	100	6 480	100
I do not talk to my adolescent about sex						
Disagree	2 509	68.8	1 972	69.6	4 481	69.2
Agree	1053	28.9	786	27.7	1 839	28.4
Refused	85	2.3	75	2.6	160	2.5
Total	3 647	100	2 833	100	6 480	100
I would be embarrassed talking to my adolescent about sex						
Disagree	2 528	69.3	2 007	70.8	4 535	70.0
Agree	996	27.3	729	25.7	1 725	26.6
Refused	123	3.4	97	3.4	220	3.4
Total	3 647	100	2 833	100	6 480	100

Notes: Weighted percentage reported. Abbreviations: COJ=City of Johannesburg, GP=Gauteng, KZN=KwaZulu-Natal, AGYW=Adolescent Girls and Young Women

3.4.5 Caregiver interactions with AGYW's schooling

More than half of the caregivers (56%) indicated that they always ask their AGYW about their day at school (Table 36). The majority (59.5%) of caregivers indicated that always know what is going on in the school their AGYW attends, while a minority (8.8%) never know what is going on with their AGYW in school. Most caregivers (58.7%) indicated the school always involves them in most school events or activities.

Table 36: Caregiver interactions with AGYW's schooling in the AGYW Study 2018

	Ekurhuleni & the COJ (GP)		uMgungundlovu & eThekweni (KZN)		Consolidated	
	n	%	n	%	n	%
I ask adolescent about her day at school						
Never	223	6.1	158	5.6	381	5.9
Almost never	71	1.9	49	1.7	120	1.9
Sometimes	601	16.5	530	18.7	1 131	17.5
Often	617	16.9	605	21.4	1 222	18.9
Always	2 135	58.5	1 491	52.6	3 626	56.0
Total	3 647	100	2 833	100	6 480	100
I know what goes on inside my adolescent's school						
Never	336	9.2	235	8.3	571	8.8
Sometimes	1110	30.4	942	33.3	2 052	31.7
Always	2 201	60.4	1 656	58.5	3 857	59.5
Total	3 647	100	2 833	100	6 480	100

Notes: Weighted percentage reported. Abbreviations: COJ=City of Johannesburg, GP=Gauteng, KZN=KwaZulu-Natal, AGYW=Adolescent Girls and Young Women

3.4.6 Caregiver perceptions of AGYW behaviour at home and school

Most caregivers indicated it was not true that their adolescent is disobedient at home (88.8%) or at school (90.7%) (see Table 37). Caregivers in Gauteng were more likely to indicate that their adolescents were disobedient at home (11.2% vs. 7.1%, respectively) than caregivers in KZN.

Table 37: Caregiver perceptions of AGYW behaviour at home and school in the AGYW Study 2018

	Ekurhuleni & the COJ (GP)		uMgungundlovu & eThekweni (KZN)		Consolidated	
	n	%	n	%	n	%
My adolescent is disobedient at home						
Not True	3 157	86.6	2600	91.8	5 757	88.8
True	407	11.2	202	7.1	609	9.4
Don't know	83	2.3	31	1.1	114	1.8
Total	3 647	100	2 833	100	6 480	100
My adolescent is disobedient at school						
Not True	3 259	89.4	2 619	92.4	5 878	90.7
True	235	6.4	148	5.2	383	5.9
Don't know	153	4.2	66	2.3	219	3.4
Total	3 647	100	2 833	100	6 480	100

Notes: Weighted percentage reported. Abbreviations: COJ=City of Johannesburg, GP=Gauteng, KZN=KwaZulu-Natal, AGYW=Adolescent Girls and Young Women

3.4.7 Caregiver exposure to HIV prevention interventions

Caregivers were asked whether they or their adolescent had ever been exposed to any of the HIV prevention interventions (listed below in Table 38 and in Figure 1). The data highlight that the intervention that had the

greatest coverage was attending training on the benefits of HIV testing¹ in the previous 12 months (21.2%), followed by the caregivers or their AGYW participating in sexuality education during life orientation at school (13.9%), training on parenting (4%) and attending a Thuthuzela care centre (3.2%). The use of the B-Wise mobile app and the ASPIRES economic strengthening programme had the lowest coverage among caregivers (0.3% each).

Table 38: Caregiver exposure to HIV prevention interventions in the AGYW Study 2018

Caregiver/their adolescent exposure to HIV prevention interventions	Consolidated	
	n	%
Participated in 'Thuthuzela care centres'? ¹	207	3.2
Used 'SASA! Activist kits'? ²	76	1.2
Participated in 'Vhutshilo 1' or 'Vhutshilo 2'? ³	86	1.3
Participated in 'Stepping stones' interventions? ⁴	24	0.4
Used the 'B-wise' mobile app? ⁵	18	0.3
Participated in 'Sexuality education in Life orientation' classes at school? ⁶	901	13.9
Participated in 'SKILLZ' interventions? ⁷	55	0.8
Participated in the 'Families Matter!' programme? ⁸	61	0.9
Participated in 'Project Teens and Adults Learning to Communicate' project? ⁹	82	1.3
Participated in the 'ASPIRES economic strengthening' programme? ¹⁰	22	0.3
Received a cash transfer or educational subsidy to help AGYW stay in school?	191	2.9
Received any training related to parenting providing care to the children in your household?	262	4
Received training/education on the benefit of HIV testing and getting to know your status? ¹¹	1 371	21.2

Notes: Weighted percentage reported. 1 Xhosa word meaning "comfort": Thuthuzela care centres provide post violence care. 2 A community mobilisation approach developed by Raising Voices for preventing violence against women and HIV. 3 Venda word meaning "life": this intervention seeks to prevent HIV. 4 This intervention aims to improve sexual health by using participatory learning approaches to build knowledge, risk awareness, and communication skills and to stimulate critical reflection. 5 Application to connect adolescents with health experts. 6 School-based sexuality education that seeks to prevent HIV transmission. 7 SKILLZ is a toolkit for educators to use when teaching young people about HIV and AIDS and life skills. 8 The Families Matter! Programme is an evidence-based, parent-focused intervention designed to promote positive parenting and effective parent-child communication about sexuality and sexual risk reduction. 9 Project Teens and Adults Learning to Communicate is a 24-session social learning programme designed to provide coping skills to HIV-positive parents and their adolescent children. 10 The ASPIRES project supports, gender-sensitive programming to improve the economic security and related health outcomes of highly vulnerable individuals, families, and children. 11 Programme where AGYW in school are given money to stay in school.



¹ Parents and caregivers are not targeted for testing within DREAMS.

4 DISCUSSION

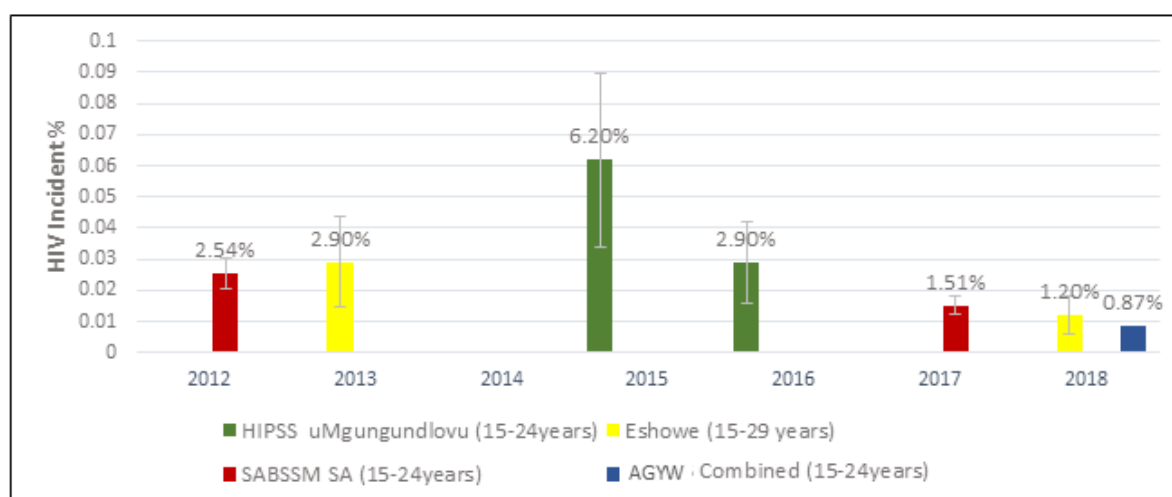
The primary objective of this study was to determine the level of HIV incidence among AGYW ages 15–24 residing in prevention targeted districts of South Africa. There were four secondary objectives which include 1) measuring HIV prevalence, and proportion of HIV positive AGYW on ART and ART naïve with detectable and undetectable HIV-1 Ribonucleic Acid (RNA) viral load; 2) measuring prevalence of pregnancies, sexually transmitted infections and access to contraceptives; 3) measuring risky sexual behaviour and prevalence of intimate partner and non-partner violence; 4) measuring participation in HIV prevention interventions and outcomes. In this report we provide select findings from the first cross-sectional survey in the districts where DREAMS and other AGYW interventions were implemented.

The study found that the overall annual HIV incidence rate in AGYW 15–24 years was higher in eThekweni and uMgungundlovu, KZN (0.91%, 95% CI: 0.77–0.94%) compared to COJ and Ekurhuleni, Gauteng (0.86%, 95% CI: 0.83–0.99 %). It perhaps be noted that the RITA algorithm excludes ARV positive samples and in the era of test-and-treat and increased uptake of ARVs. This may result in under-counting of recent infections and lower incidence calculation^[67]. In addition, the sample was not a random sample, but rather selected districts where DREAMS and other AGYW programmes had been implemented. Hence, comparisons might be drawn cautiously with other annual HIV incidence studies.

Figure 5 illustrates the annual HIV incidence rates for AGYW 15–24 years between 2012 and 2018 for several surveys. While the population groups and study methodologies are not the same, the surveys use similar incidence methodologies. These findings provide some tentative indication of declining incidence trends in AGYW 15–24 years.

- The AGYW Study incidence for AGYW 15–24 years in Johannesburg & Ekurhuleni in Gauteng was 0.86% and for eThekweni & uMgungundlovu, KZN was 0.91%. The annual HIV incidence rate was lower in KZN in AGYW aged 15–19 years (0.46%, 95% CI: 0.41– 0.50%) compared to Gauteng (0.75%, 95% CI: 0.68–0.83%).
- The HIV Incidence Provincial Surveillance System (HIPSS) study in uMgungundlovu included two cross-sectional surveys between June 2014 and June 2015 and July 2015 to July 2016. The HIPSS study population was drawn from the same AGYW survey areas in uMgungundlovu. The HIPSS incidence in AGYW 15–24 years in the 2014 survey was 6.2% (95% CI 3.50–9.10) and 2.9% (95% CI 1.40–4.50) in the 2015 survey.^[68]
- The HIV incidence in the South African National HIV Prevalence, Incidence, Behaviour and Communication Survey Study (SABSSM) uses a similar incidence biomarker-based methodology to the AGYW Study. The HIV incidence findings for AGYW 15–24 years at the national level was 2.54% (95% CI 2.04–3.04) in 2012 and 1.51% (95% CI 1.31–1.71) in 2017.^[69]
- The Mbongolwane and Eshowe (Eshowe), KZN, 2013 annual HIV incidence study results for young women of 15–29 years used a combination of biological and modelled incidence rates. The annual HIV incidence in 2013 in AGYW 15–24 years was 3.2% (95% CI 2.10– 4.20).^[70]

Figure 5: Annual HIV incidence rates in AGYW 15–24 years from 4 Surveys between 2012 to 2018



Abbreviations: HIPSS= HIV Incidence Provincial Surveillance System, SABSSM= South African National HIV Prevalence, Incidence, Behaviour and Communication Survey Study, Eshowe= Mbongolwane and Eshowe (Eshowe), KZN. 2013 HIV incidence study

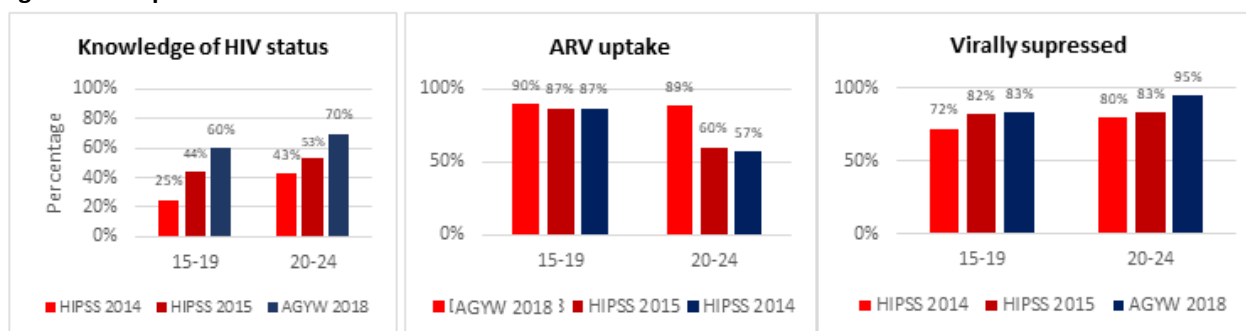
In other settings, declines in incidence have been associated with scale-up in ART programmes, the changing and maturing nature of epidemics and shifts in social and behavioural factors related to sexual practice. It is, however, difficult to make definitive statements for this declining trend in this study because of the absence of longitudinal and cohort-based designs that test for specific cause-effect mechanisms.

This cross-sectional study indicated that 10.4% of the AGYW in the AGYW Study were HIV positive. The overall HIV prevalence differed substantially among AGYW between KZN and Gauteng, with AGYW in KZN (15.1%, 95% CI: 14.1–16.0) having a higher HIV prevalence than AGYW in Gauteng (7.8%, 95% CI: 7.2–8.4). The HIPSS study in uMgungundlovu^[71] (one district in which the AGYW Study collected data) found the HIV prevalence among 15–19-year-old women to be 12%, which is similar to this study's HIV prevalence of 10.2% among females aged 15–19 years old in KZN. These results are also similar to a 2016 study conducted in the rural uMkhanyakude district where prevalence was 9% (15–19-year-olds)^[72]. The HIPSS study and the uMkhanyakude study had higher HIV prevalence estimates than the AGYW KZN sample for the age group 20–24 years old (32% and 30% vs. 24%, respectively). Unfortunately, there are no comparative estimates of HIV prevalence for the 12 to 14-year age group. As noted previously, differences in study populations, geographical location, and dates when studies occurred makes meaningful comparisons difficult. These findings highlight the importance of scaling up HIV prevention technologies as the number of AGYW infected with HIV is still very high even as annual HIV incidence may be declining, as indicated in our results and other studies from KZN.

The UNAIDS fast track strategy to end AIDS by 2020 is a key mechanism for epidemic control. This cross-sectional study provided data on AGYW which are an important population to monitor the UNAIDS strategy to end AIDS by the end of year 2020: 90% of those who are HIV positive will know their HIV status, 90% of all people diagnosed with HIV will receive sustained ART, and 90% of those receiving sustained ART, will be virally suppressed (less than 1000 RNA copies per ml). This study found that overall, 62.0% of positive AGYW knew their HIV status. This finding indicates that getting HIV positive individuals to test is the major hurdle to achieving the UNAIDS fast track targets. A reinvigorated HIV testing campaign that is well targeted needs to be undertaken to achieve epidemic control. The AGYW performed well (87.0% of AGYW who know they are positive are on treatment) on the second and third 90 (90.5% of AGYW who are on treatment are virally suppressed).


Comparing the uMgungundlovu HIPSS studies in 2014 and 2015 and the AGYW Study conducted in 2018 in eThekweni and uMgungundlovu, KZN (see figure 6), provides some indication of possible changes in knowledge of status and treatment trends. The biggest improvement was in knowledge of HIV status in the 15–19 year age group: it increased from 25% in the 2014 HIPSS, to 44% in 2015 HIPSS and to 60% in the AGYW Study in 2018. In the 20–24 year age group it increased from 43% in HIPSS 2014, to 53% in HIPSS 2015 to 70% in the AGYW study in 2018 (Figure 6). ARV uptake was similar in the 15–19 year age groups in all three time points but increased in the 20–24 age group from 57% in HIPSS 2014 to 89% in AGYW Study in 2018. Viral suppression improved in the younger age group 15–19 years from 72% in HIPSS 2014 to 90% in AGYW Study in 2018. These findings provide a possible indication of improvements in performance of the treatment cascade in KZN which bodes well for reaching the UNAIDS fast track targets.

Figure 6: Comparison of Treatment Cascade trends in AGYW 2014–2018



With regards to sexual risk behaviours, approximately half of the AGYW in this study had ever had sex. Just under half of the sexually active AGYW (48%) had used a condom during their last sexual encounter. Just under a half (49.9%) of AGYW in Gauteng used condoms the last time they had sex and 44.5% of AGYW in KZN used condoms the last time they had sex. We compared condom use in the AGYW Study to HIPSS Survey of AGYW aged 15–19 years to see if condom use has improved. In the HIPSS study only 21.7% of AGYW 15–19 years old used condoms at last sex whereas in the AGYW Study it was 43.9% for 15–19 year olds^[73]. The HIPSS study was conducted in uMgungundlovu, one of this study’s districts, and may therefore be comparable. In the HSRC National Survey, condom use for AGYW aged 12–24 years old was 49.8% at last sex^[74]. These results highlight that condom use has remained suboptimal — as condom use at last sex in this study is similar to the HSRC study conducted in 2012 — and that sexuality education in schools could be strengthened so that the norms around condom use may change.

Previous studies have shown that power inequities in relationships and more specifically intimate partner violence increase risk of HIV infection in young South African women^[75]. The prevalence of self-reported intimate partner violence and self-reported non-partner violence was similar or lower than other studies in South Africa. Self-reported IPV among partnered young women was 14.3% in our study and 23% in a study in Eastern Cape using the same measure, although this study included people 15–26 years old^[63]. A study conducted in a highly adverse context of informal settlements in eThekweni municipality presented with a very high prevalence of self-reported IPV at 65.2% (women aged 18–30 years)^[76]. Although the prevalence of self-reported IPV is lower in this study than in the study in eThekweni, the rate of self-reported IPV and self-reported non-partner violence was still unacceptably high and greater coverage of interventions is required to reduce the prevalence of IPV. The AGYW Study data also highlighted that young women are more likely to report experiencing violence from their intimate partners than from a non-partner. Furthermore, AGYW were more likely to report experiencing physical IPV than sexual IPV and young women 20–24 years old were more likely to report experiencing IPV than young adolescents 12–15 years old. The results highlight the need for including partners of AGYW in IPV and HIV prevention interventions.




The results on resilience highlight that most AGYW displayed comparable levels of resilience to studies that used the same measure in other contexts. Even though our comparisons are tentative because of the lack of reliability studies on these measures in different contexts, we noted that the resilience scores from adolescents in studies based in Jordan (M=50.3)^[77], Turkey (M=46.3)^[78] and Canada (M=46.1)^[79] had slightly lower levels of resilience than the AGYW in our study (M=51.4). The differences in scores on resilience between AGYW in this study and the abovementioned studies are only marginal. The findings on psychological wellbeing highlights that depressive symptoms appear to be quite low in the sample. When comparing this to HIPSS results, the depression symptoms are slightly lower in the AGYW Study (2.7 vs. 0.8 for KZN AGYW sample). Young women aged 20–24 years old appear to be slightly more at risk for presenting with depression symptoms than young adolescents (12–14 years old); the latter had on average a slightly higher number of depressive symptoms (Gauteng: 0.8 vs. 1.6 and KZN: 0.4 vs. 1.1, respectively). The results suggest that the sample of AGYW does not appear to have major psychosocial vulnerabilities. In addition, it is encouraging that substance use appears to be very low for this group of individuals. In the 2011 National Youth Risk behaviour survey^[80], 28.2% of South African youth drank alcohol in the previous 30 days; this is higher than the AGYW data as 17.7% drank alcohol in the previous 12 months. It is clear from the substance use data that older women aged 20–24 years old are more likely to drink alcohol than younger adolescents (15–19 years old) in Gauteng (M=0.8 vs 1.3, respectively) and KZN (M=0.4 vs. 0.8, respectively). While some of these findings are encouraging, it may be noted that these variables act in complex ways with HIV risk and HIV acquisition. More complex and in-depth analysis is required to elucidate the role of these variables in HIV risk pathways.

The AGYW Study also highlights that a high proportion (32%) of AGYW were or had engaged in an age-disparate relationship (partner is five or more years older than the AGYW). These data are comparable to the data drawn from HIPSS where 32% of the sample of 15–24 year old women reported that their most recent partnership involved a partner five or more years older than they were while almost half the sample (46%) reported at least one age-disparate partner either in any of their three most recent partnerships or in their first-ever partnership. The national HSRC survey revealed that 34% of AGYW aged 15–19 years old engaged in age-disparate relationships, whereas a lower percentage of AGYW aged 15–19 engaged in age-disparate relationships in KZN (24%) and Gauteng (27%) in the AGYW Study. Partnerships with older men have shown to increase young women's risk of HIV infection. First, older male partners are more likely to be HIV-infected with an unsuppressed viral load than younger partners^[81]. Second, condom-less sex^[82], transactional sex^[83], higher frequency of sex^[84,85], and concurrent sexual partnering^[86], are more prevalent in age-disparate partnerships.

The study also found that more than half (56%) of sexually active AGYW had ever been pregnant and less than one-third (31%) of AGYW were taking some form of contraception. The uMkhanyakude study highlights a significant disparity in contraception use by age (23% among 15–19 years old and 50% among 20–24 years old)^[87]. The AGYW KZN data had lower levels of contraception use among the 15–19-year-olds (21.4%) and greater contraception use among the 20–24-year-olds (52.0%). For the HIV Prevention programme to achieve its targets, more needs to be done to improve access and utilization of contraception.

The AGYW Study results highlight significant gaps in the coverage of HIV prevention interventions among the AGYW. The intervention with the greatest coverage (59.6%) was school-based sexuality education; however, we were not able to distinguish if this sexuality education was delivered as part of the DREAMS programme. As previously mentioned, HIV testing coverage was sub-optimal (64.1% tested) and condom use is generally poor (only 20.6% used condoms consistently/always) within the sample. Furthermore, access to Pre-exposure prophylaxis (PrEP) was low with only 10.8% (n=160) of those who had heard of PrEP (11.5% of the full sample) having ever used PrEP. However, the distribution of PrEP is a very targeted intervention and high levels of



coverage are not to be expected. Only 23.7% of AGYW attended support group programmes. The results also highlight that there was greater coverage in KZN than in Gauteng on many of the HIV prevention interventions. The use of PrEP, condom use, and HIV testing will need to improve for DREAMS to reach its target of reducing annual HIV incidence by 40% over two years.

The National HIV prevalence, incidence and behaviour study conducted by the Human Sciences Research Council (2017) indicated that knowledge on how to prevent HIV had decreased significantly between 2008 and 2012 and then increased again in 2017, although overall knowledge about how HIV is transmitted was poor. The low level of knowledge is in a context of high levels of risk behaviours (poor condom usage, high levels of transactional sex and high levels of age-disparate sex). In the AGYW Study, knowledge on HIV prevention was poor on some items, such as the ability of ARVs to reduce the likelihood of transmitting HIV (only 35.6% answered correctly). Additionally, only 64.1% indicated that sex with one uninfected partner can reduce one's chances of contracting HIV. These prevention knowledge gaps among the AGYW could be improved within these districts and the role of comprehensive sexuality education is very important in achieving greater accurate HIV knowledge among AGYW.


The AGYW Study highlighted that approximately a quarter of the caregivers were unwilling to discuss sex (23%) or were too embarrassed (27%) to answer questions relating to sex with the AGYW in their care. These AGYW would not have been empowered by their caregivers about sexual reproductive health or sexuality. In addition, the exposure to parenting programmes (1%) and other sexual reproductive health programmes (for example, 0.3% participated in Stepping Stones) was very low. Caregivers play an important role in empowering AGYW with knowledge about sexual reproductive health, sexuality and human rights and to instil confidence in AGYW to make informed decisions about their health choices.

4.1 Strengths of the study

The study has several strengths. The survey was based on random sampling and ensured representativeness of AGYW in the DREAMS targeted areas. The sample is large enough to allow for meaningful analyses of data, enable generalizability and a good understanding of the HIV epidemic in these selected areas. Participation rates were high and bias in the sample was limited as a random sampling approach was employed which ensured representativeness of the sample and hence there was no systematic exclusion of participants in the sample. The use of laboratory testing provides rigorous and precise measurements of HIV prevalence, HIV incidence, and ART use among AGYW in this sample. The sample also included 12–14-year-olds, which is quite rare as most studies use a cut off age of 15 years old or higher.

4.2 Limitations of the study

This study has several limitations. Fieldwork for the study started after implementation of the intervention; therefore the results presented here are not a true baseline for the AGYW Study. The response rate (91.8% at a household level and 97.8% at an individual level) may have biased the sample drawn for the study. There is generally a degree of under-reporting on the sensitive behavioural, pregnancy, and STI data. These under-reported data can be due to recall issues where a respondent forgets about an incident that occurs or to social desirability bias (this refers to respondent's reporting a behaviour that would appear to be more socially appropriate than their "true" behaviour). Staff were well trained to manage these sensitive situations and to ensure confidentiality to reduce social desirability bias. The study selected only participants from DREAMS-targeted areas; therefore, the results are not representative of the KZN and Gauteng provinces or the four districts, although they are representative of the areas that DREAMS was implemented in. The results from the HIV prevention intervention exposure items need to be interpreted with caution. The under-reporting or over-reporting of exposure to these interventions is unknown. More research is required to understand how



to measure exposure to a complex HIV prevention programme using self-reported data. The study was powered on the assumption that the HIV incidence was 3% and 4% in Gauteng and KZN, respectively. Additionally, a higher HIV prevalence rate of 25% was expected. Based on the observed HIV prevalence and incidence rates, the current sample size would not be sufficient to detect the expected change in incidence, and careful consideration will need to be given to the sample size required in the second wave.

4.3 Conclusion

The AGYW Study's annual HIV incidence was lower than the results of previous studies among young women in a similar geographic region conducted two years earlier. The HIV prevalence varied by geographic region with the KZN sample having significantly higher HIV prevalence compared to the Gauteng sample. The performance on the UNAIDS first 90 (proportion of those infected who know they are infected) was insufficient to meet the targets with less than two thirds of AGYW reporting knowledge their HIV status. However, the data indicated that the second and third 90 targets were almost achieved by respondents in this study. Condom use in this population of AGYW was suboptimal, despite nearly half of all individuals having attended condom training. The findings highlight the importance of scaling up HIV prevention technologies as the number of AGYW infected with HIV is still very high even as annual HIV incidence may be declining, as indicated in our results and other studies from KZN


The study identified a greater need for condom promotion, improved HIV Counselling and Testing (HCT) and linkages to care to obtain viral suppression, improved knowledge on pre-exposure prophylaxis (PrEP); expanded GBV prevention as well as post-violence care and support and linkage to sexual reproductive health (SRH) services. Expanding programs that offer HIV prevention interventions for AGYW and caregivers in these areas may provide an opportunity to improve health outcomes.

4.4 Considerations

- Improving the coverage of HIV prevention interventions is critical to improving HIV outcomes for the AGYW in these districts. These include a strong focus on addressing the social vulnerabilities of dropping out of school and those who complete school and have no further employment opportunities.
- The high levels of HIV prevalence (10.4%) and moderate levels of HIV testing coverage (67.0%) mean that AGYW could be closely targeted for HIV testing and treatment services. Better coverage of HIV testing is required to enhance knowledge of AGYW's own HIV status. In addition, we recommend improved access to comprehensive sexuality education as this could address these gaps in HIV testing.
- Programmes should also target older male partners with HIV prevention (i.e. HIV testing services and VMMC) and treatment interventions, given high prevalence of age-disparate partnerships in these data.
- The low levels of awareness and access to PrEP need to be improved by starting with public health education campaigns.
- Condom use as a form of pregnancy, HIV and STI prevention needs to be revitalized again in all public health campaigns. The importance of ART in reducing the transmission of HIV could be highlighted in public health campaigns, as it appears there is a gap in knowledge on the benefits of using ART.
- More research is needed on the appropriate combination of interventions that directly contribute to lowering HIV incidence.
- There appears to be a need for scaling-up caregiver programmes and greater inclusion of parents in DREAMS programmes.
- Finally, we recommend that a follow-up survey in the same areas be conducted in two or three years to see if there has been a change in annual HIV incidence and other important secondary outcomes.

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