Background
Persistent human papillomavirus (HPV) infection is associated with anogenital warts (AGWs), genital and oropharyngeal cancers in men, particularly in HIV+ men(1). The natural history of HPV infection is altered by HIV infection(2). Low CD4+ counts (<200 cells/μL) are associated with an increased risk of AGWs(3). There are few data on the burden of HPV infection and disease in HIV+ men in South Africa. We report baseline results of a prospective study to determine the natural history of anogenital HPV infection and disease in men.

Methods
We enrolled 454 (150 HIV- and 304 HIV+) consenting men (age ≥ 18 yrs) into an 18- month cohort study between March 2011 and October 2012 in Johannesburg. Socio-demographic, sexual and social behaviour data was collected by an interviewer administered questionnaire. Trained clinicians conducted examination for AGWs, collected blood [CD4+ count and plasma viral load (PVL)] and genital swabs for HPV DNA testing with Roche Linear Array. Univariate and multivariate analysis (logistic regression) were done in STATA to determine factors associated with prevalent AGWs.

Results
Baseline characteristics
The median age (IQR) was 34 years (14), 53.0% (242) had ever smoked, 25.4% (111) were circumcised, 4.0% (18) had sex with men and 26.1% (118) had >1 sexual partner in the previous three months. At enrolment among the 304 HIV+ men, 65.0% (197) were on ART, the median (IQR) CD4+ count was 439(248) cells/μL and 37.8% (115) had undetectable PVL (ie <40 copies/mL).

Prevalence of HPV infection and AGWs
There were 349 valid genital HPV results and 75.6% (264) were positive for at least one type of HPV. The prevalence of at least one type of HPV infection was higher among HIV-positive men [81.1% (227/282)] when compared to HIV-negative men [55.2% (37/67)]. See fig 1 for HPV type distribution. The overall prevalence of AGWs was 8.4% (38/354) while it was 11.8% (36/304) and 1.3% (2/150) among the HIV-positive and HIV-negative men respectively.

Discussions
Circumcision and higher CD4+ counts were protective against AGWs. Infection with HPV types 6 and 11 was strongly associated with prevalent AGWs. HIV-positive men were almost eight times at risk of AGWs compared to HIV-negative men. Smoking, condom use, ART status and PVL were not significantly associated with AGWs.

Conclusion
Circumcision and quadrivalent HPV vaccines could reduce the high disease burden among HIV-positive men. Further research is needed to understand persistence and progression of genital infection and disease, including the impact of ART.