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Paper Title
165 - Global Modelling Analysis: Impact of Improved HPV Vaccination on Noncervical Cancers in PLWHIV

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Background
HIV infection significantly increases carcinogenesis following HPV infection. The impact of this relationship on the cervical cancer burden is well documented. Less is known on HPV non-cervical cancers including anal, oropharyngeal, vaginal, vulvar and penile cancers. The World Health Organisation (WHO) aims to vaccinate 90% of girls under 15 against HPV, yet global vaccine coverage is low at 21% for girls and 7% for boys. Coverage is especially low in countries with a high HIV prevalence. We aimed to evaluate the burden of HPV non-cervical cancers in people living with HIV (PLWHIV) and model the potential impact of improved gender-neutral HPV vaccine coverage worldwide.

Methods
We collected epidemiological data on cancer incidence in 185 countries from the GLOBOCAN 2022 database. HIV prevalence was collected from UNAIDS 2022, which analyses country-specific rates using the SPECTRUM model. The number of cancer cases was combined with relative risks of developing each cancer and HIV prevalence data to generate a population attributable fraction, which estimates the number of cancers ‘attributable’ to HIV. Lastly, we modelled the impact of improved vaccine coverage using point vaccine efficacy estimates and country-specific HPV vaccine coverage levels from the WHO.

Conclusion
This analysis adds to the consensus that PLWHIV warrant special consideration in HPV prevention. More research is needed on vaccine efficacy in PLWHIV to inform future analyses. HPV vaccination is particularly important in Southern Africa where a large concurrent burden of HIV-attributable cancers exists. Ultimately, in countries with high HIV/HPV coinfection rates, integrating these services could minimise disparities in the global HPV cancer burden.

Results
Globally, this burden exhibited significant geographical variation; 29% of all HPV-related non-cervical cancer cases in Africa may be HIV-attributable, compared to 5% worldwide. For anal cancer, an estimated 35,719 cases occurred worldwide in 2022 and 12.4% of these may have been attributable to HIV. This attributable fraction ranged from 1.5% in Southeast Asia, to 10.6% in the Americas, to more than 41.8% in Africa. We show that out of the ten countries with the highest number of HIV-attributable cancers, only two had vaccine coverage rates over 50%. Globally, our model shows that if gender-neutral vaccine coverage increases to the WHO’s 90% target, we could prevent 6854 cancer cases in PLWHIV; reflecting more than double the number currently prevented.