

Supplementary material

Table of Contents

<i>Supplementary Tables</i>	2
Supplementary Table S1. Characteristics of included 26 studies.	2
<i>Supplementary Figures</i>	4
Supplementary Figure S1. Study identification.	4
Supplementary Figure S2. Age-specific prevalence of anal and cervical non-16 HR-HPV infection in HIV-negative women and women with HIV.	5
Supplementary Figure S3. Age-specific prevalence of anal and cervical 2v-, 4v-, and 9v-HPV infection in HIV-negative women and women with HIV.	9
Supplementary Figure S4. Percentage of women with HIV according to current CD4 and age group.	10
Supplementary Figure S5. Combination of cervical and anal non-HPV16 prevalence in HIV-negative women and women with HIV, according to age group.	11
<i>References</i>	15

Supplementary Tables

Supplementary Table S1. Characteristics of included 26 studies.

Study	Country	Number of women with both anal and cervical HPV16 results			Number of women with both anal and cervical cytopathological results ^a		
		HIV-negative women	WWH	Overall	HIV-negative women	WWH	Overall
Duan et al (2021) [1]	China	0	409	409	0	409	409
Morhason-Bello et al (2021) [2]	Nigeria	291	7	298	0	0	0
Rodrigues et al (2019) [3]	Brazil	112	41	153	0	0	0
de Pokomandy et al (2017) [4]	Canada	0	149	149	0	136	136
Dube Mandishora et al (2017) [5]	Zimbabwe	74	69	143	0	0	0
Wei et al (2018) [6] ^b	China	2281	0	2281	0	0	0
Heard et al (2016) [7]	France	0	311	311	0	141	141
Menezes et al (2016) [8]	India	0	46	46	0	0	0
Ortiz et al (2016) [9]	Puerto Rico	535	0	535	0	0	0
Cambou et al (2015) [10]	Brazil	0	457	457	0	456	456
Ramautarsing et al (2015) [11]	Thailand	0	90	90	0	84	84
Tso et al (2015) [12]	Brazil	0	42	42	0	42	42
Godbole et al (2014) [13]	India	0	97	97	0	0	0
Kojic et al (2014) [14]	USA; Brazil; South Africa	0	287	287	0	0	0
Moscicki et al (2014) [15]	USA	88	1	89	0	0	0
Remis et al (2013) [16]	Canada	291	126	417	0	0	0
Hernandez et al (2013) [17] ^b	USA	187	0	187	0	0	0
Hessol et al (2013) [18]	USA	150	386	536	137	330	467
Mullins et al (2013) [19]	USA	103	188	291	0	0	0
Ortiz et al (2013) [20]	Puerto Rico	99	0	99	0	0	0

Study	Country	Number of women with both anal and cervical HPV16 results			Number of women with both anal and cervical cytopathological results ^a		
		HIV-negative women	WWH	Overall	HIV-negative women	WWH	Overall
Castro et al (2012) [21] ^b	Costa Rica	2107	0	2107	0	0	0
Kojic et al (2011) [22]	USA	0	152	152	0	130	130
Goncalves et al (2008) [23]	Brazil	0	102	102	0	0	0
Hernandez et al (2005) [24] ^b	USA	1582	0	1582	0	0	0
Moscicki et al (2003) [25]	USA	0	188	188	0	0	0
Palefsky et al (2001) [26]	USA	0	129	129	0	124	124
Overall		7900	3277	11177	137	1852	1989

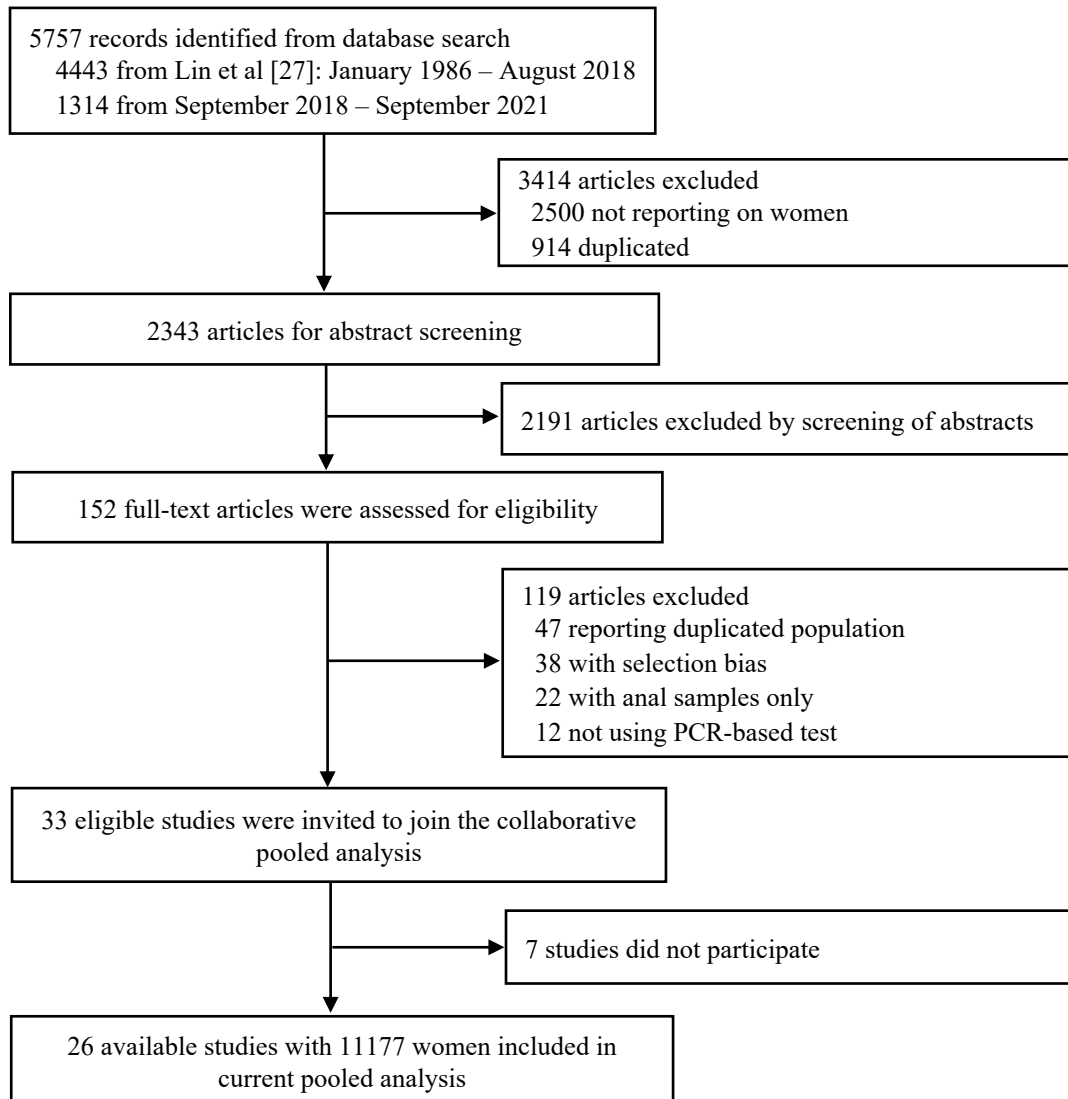
Abbreviation: HPV, human papillomavirus; WWH, women with HIV.

^aOnly including studies that tested all 13 high-risk HPV types.

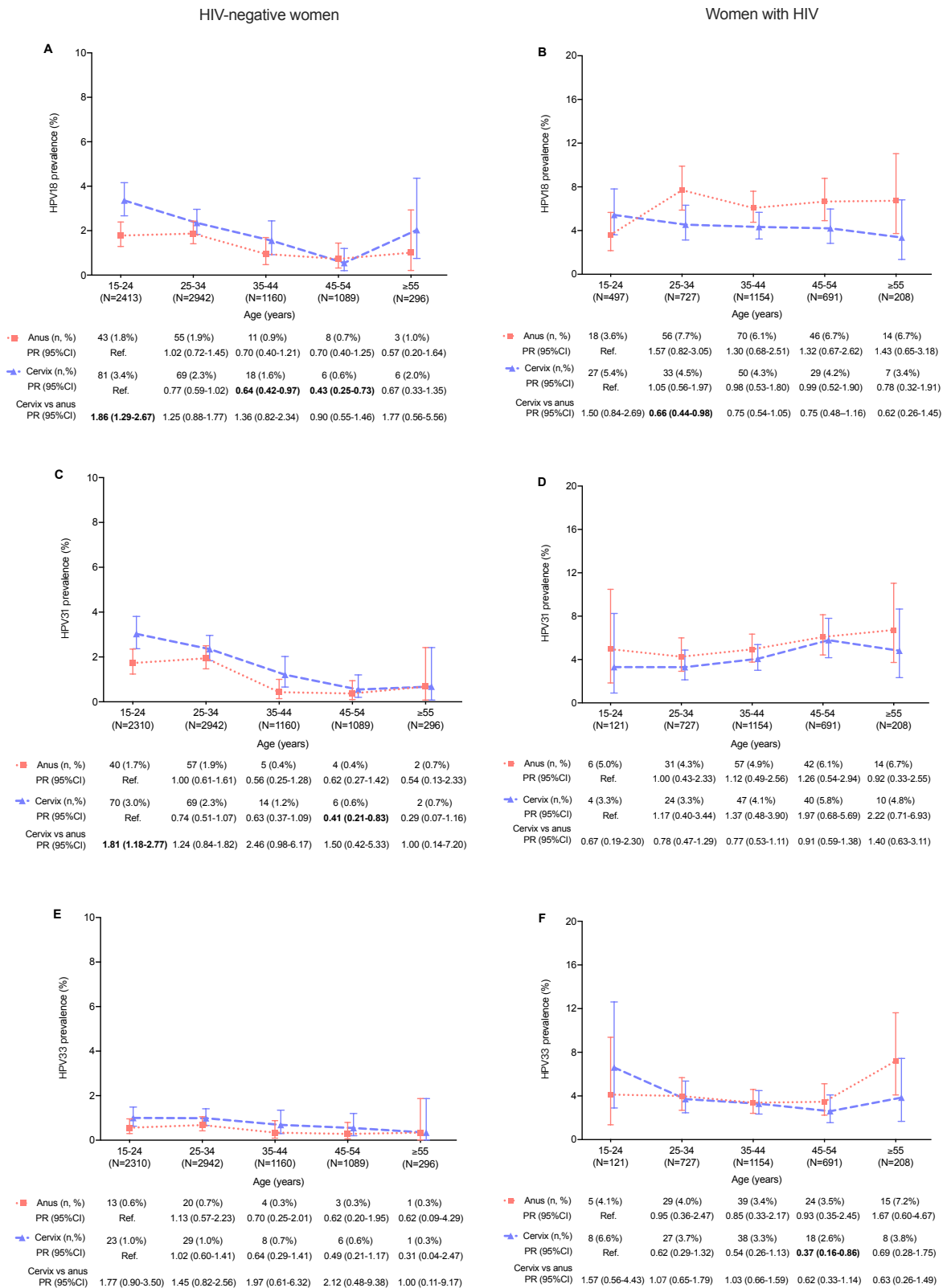
^bThese studies were deemed to be the population-based studies for which women were assumed to be HIV-negative, even in the absence of such information at an individual level, as we did before [27].

Supplementary Figures

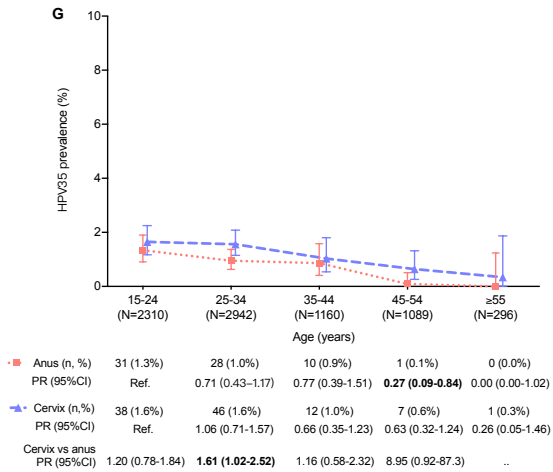
Supplementary Figure S1. Study identification.



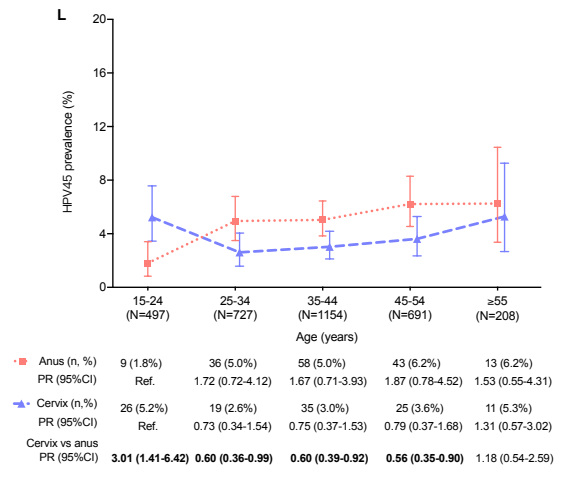
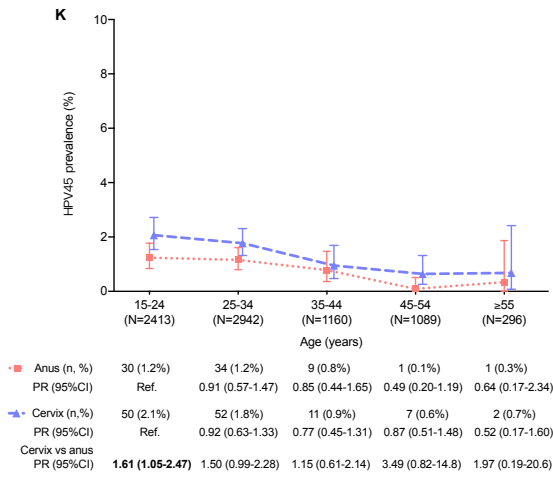
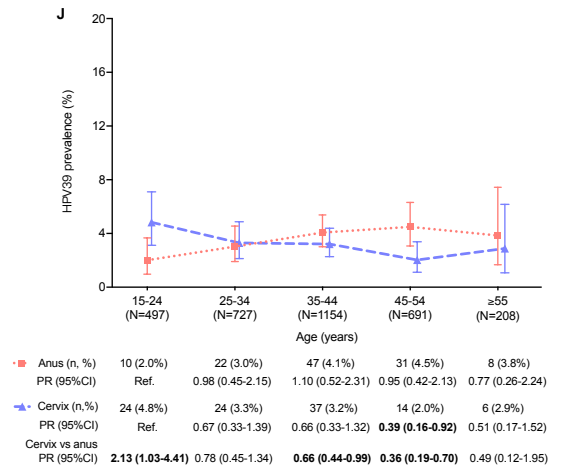
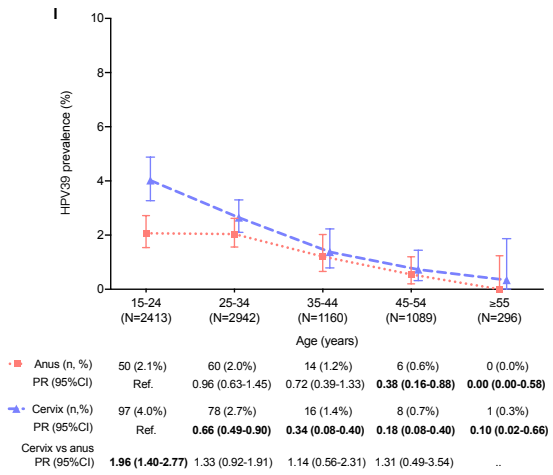
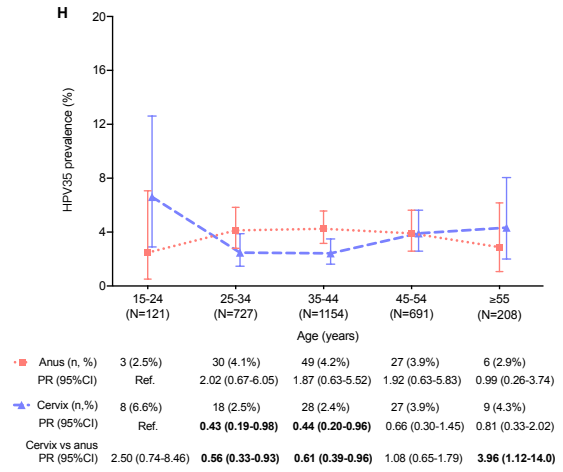
Supplementary Figure S2. Age-specific prevalence of anal and cervical non-16 HR-HPV infection in HIV-negative women and women with HIV. Error bar=95% CI. Significant PRs relative to the reference group are shown in bold. Abbreviation: PR, prevalence ratio; HR-HPV, high-risk human papillomavirus.



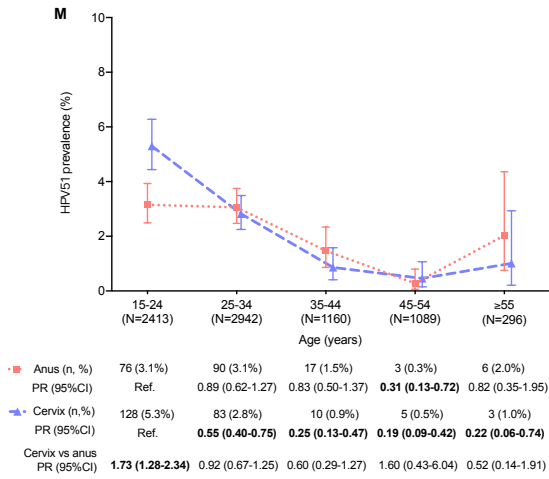
HIV-negative women



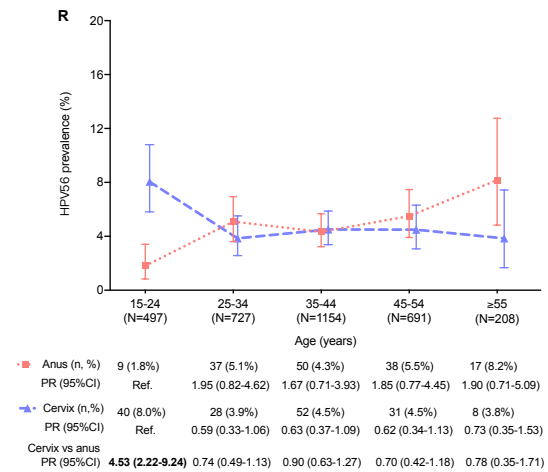
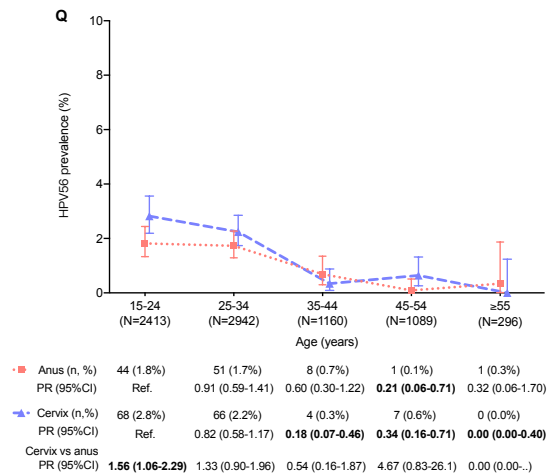
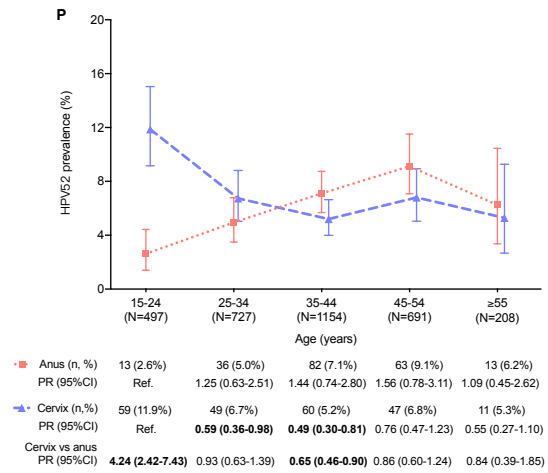
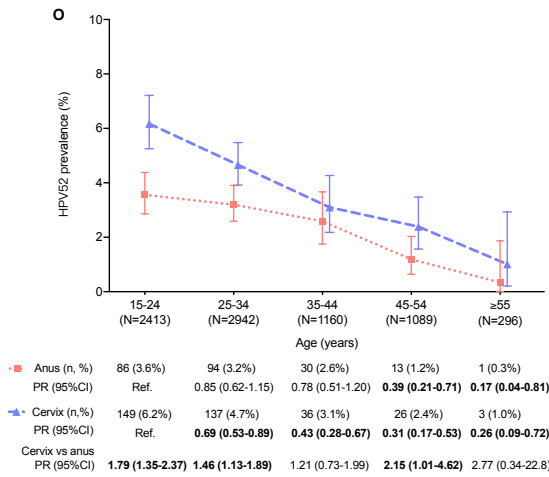
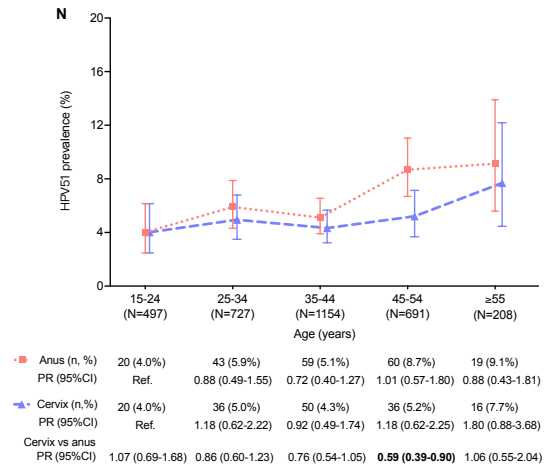
Women with HIV



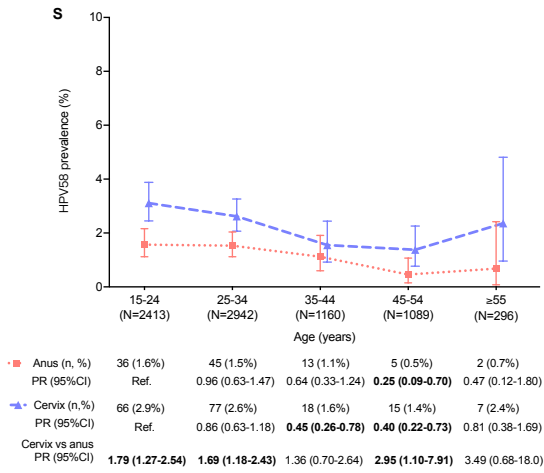
HIV-negative women



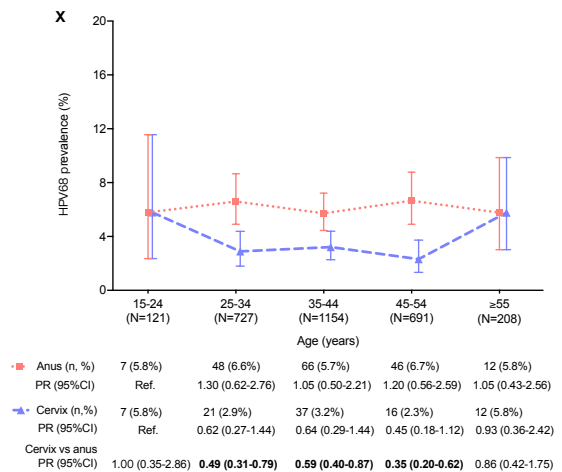
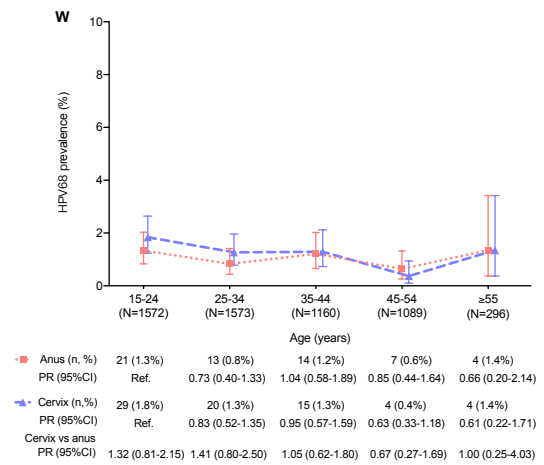
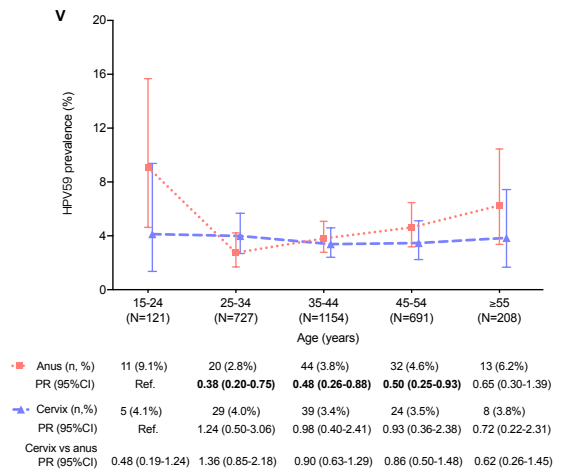
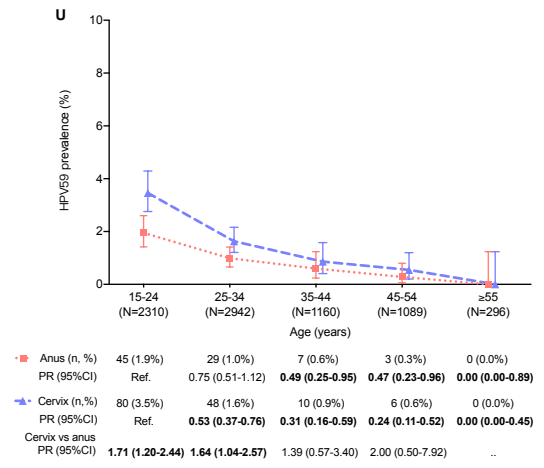
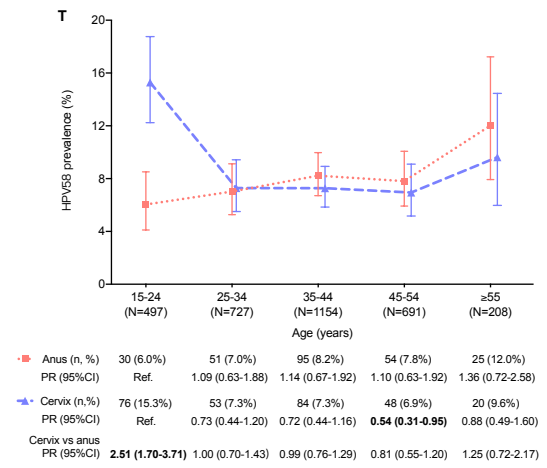
Women with HIV



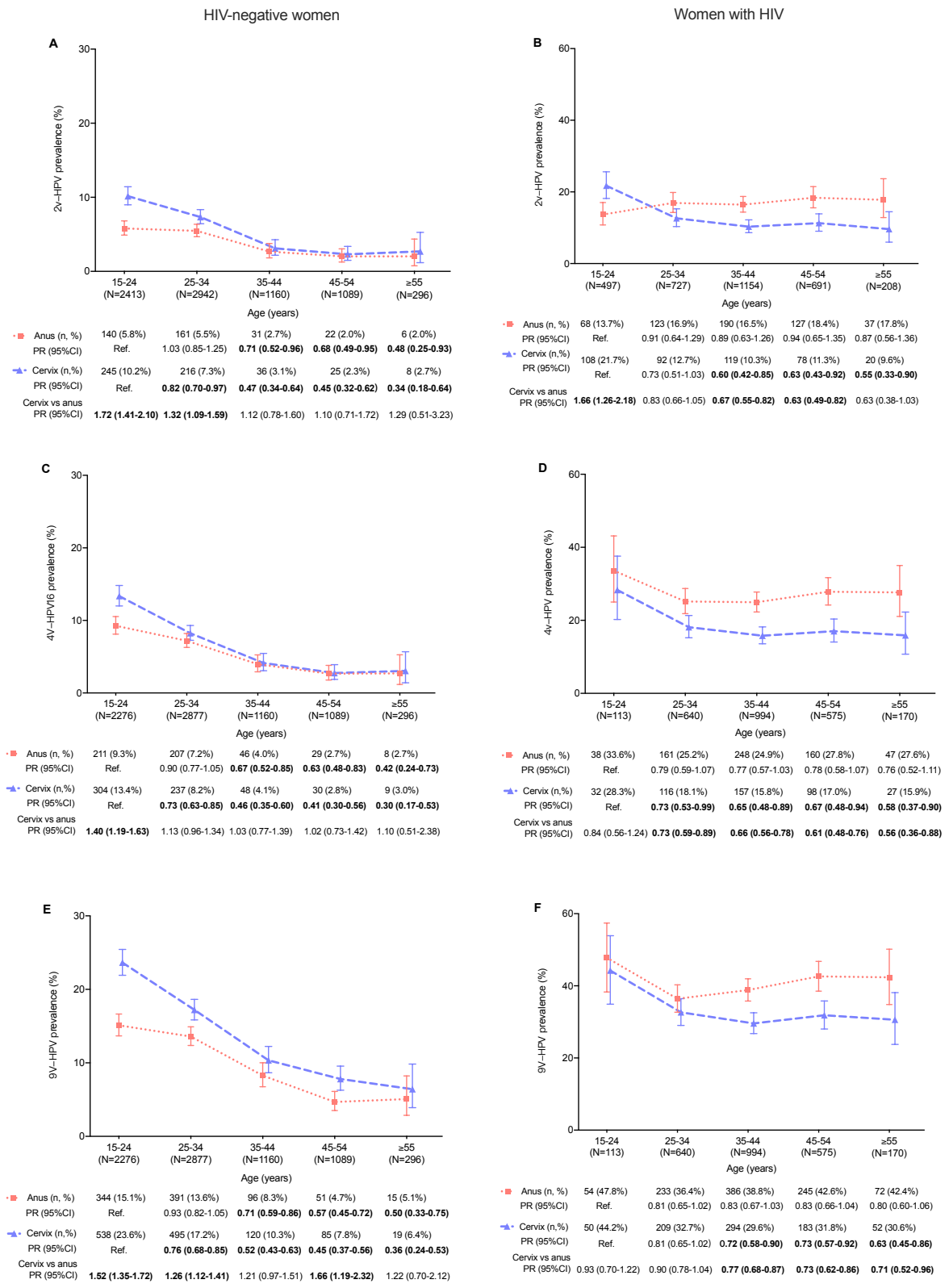
HIV-negative women



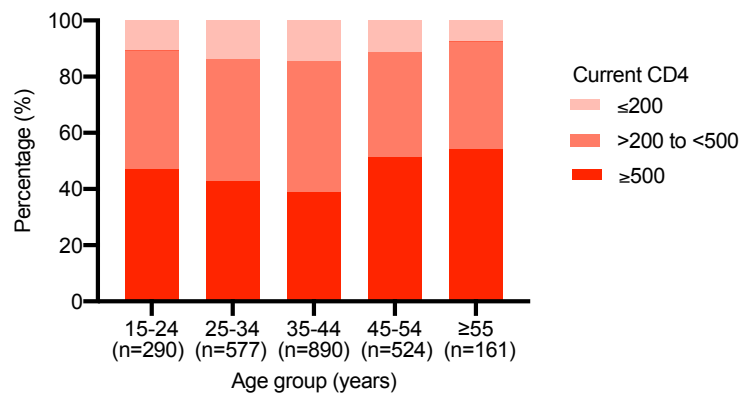
Women with HIV



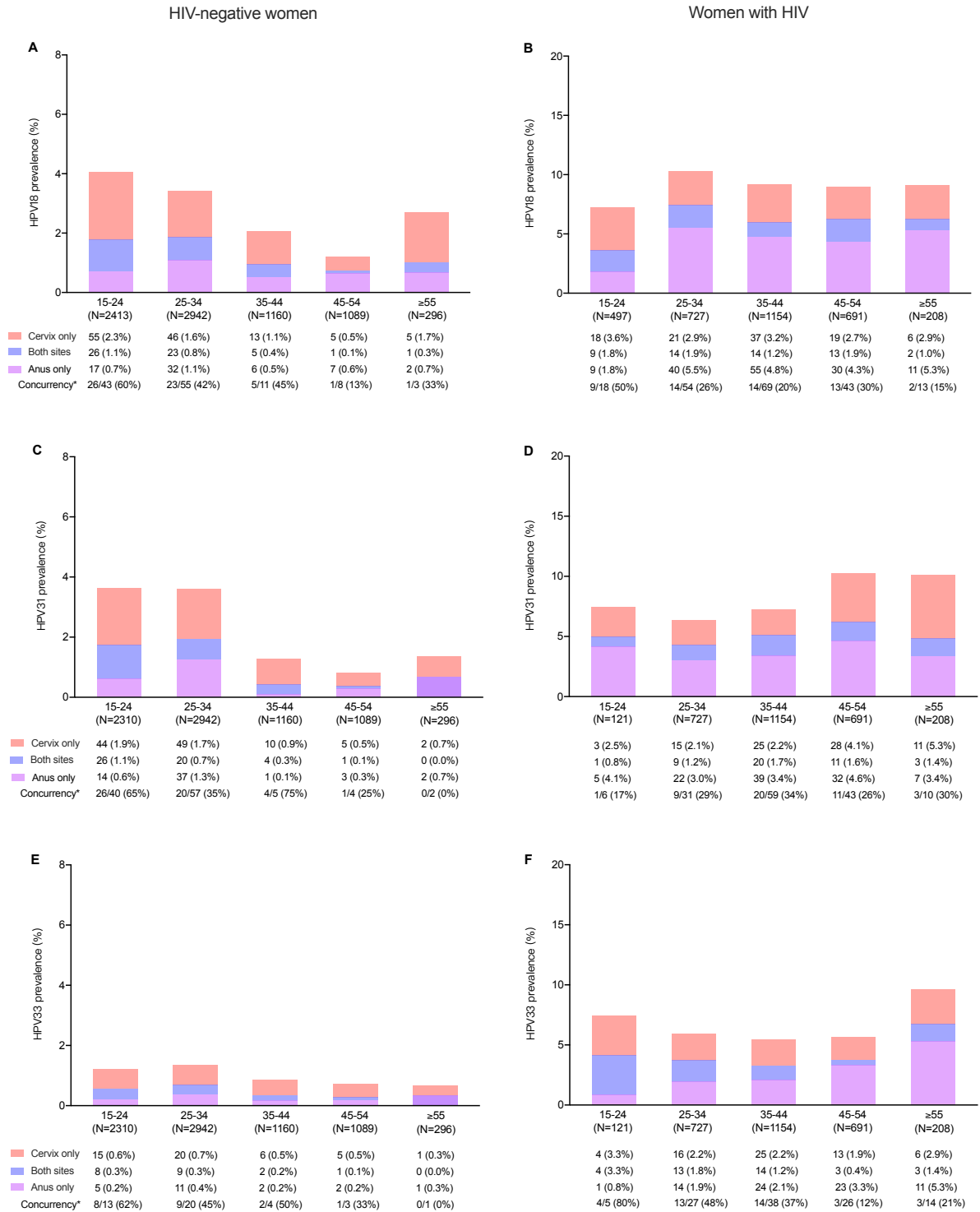
Supplementary Figure S3. Age-specific prevalence of anal and cervical 2v-, 4v-, and 9v-HPV infection in HIV-negative women and women with HIV. Error bar=95% CI. Significant PRs relative to the reference group are shown in bold. Abbreviations: HPV, human papillomavirus; 2v-HPV: HPV16 and 18; 4v-HPV: HPV6, 11, 16, and 18; 9v-HPV: HPV6, 11, 16, 18, 31, 33, 45, 52, and 58; PR, prevalence ratio.



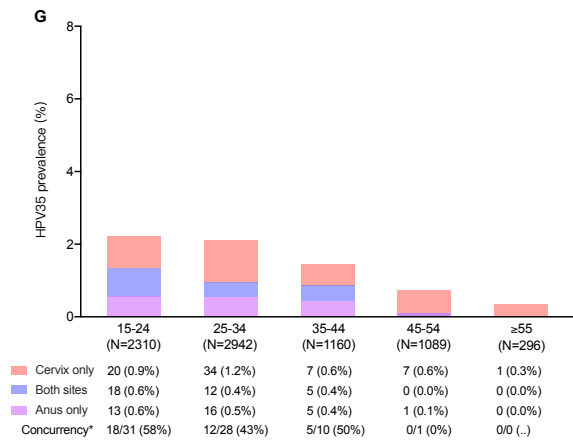
Supplementary Figure S4. Percentage of women with HIV according to current CD4 and age group.



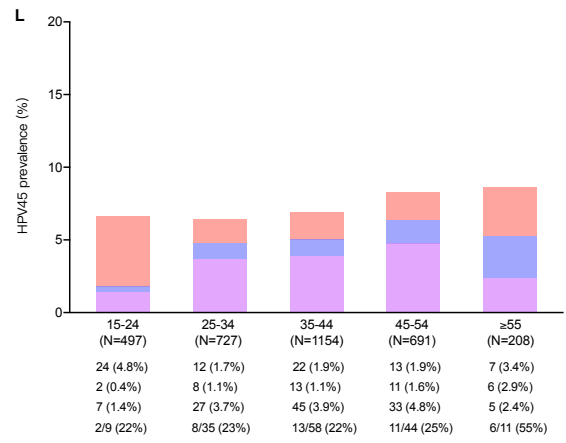
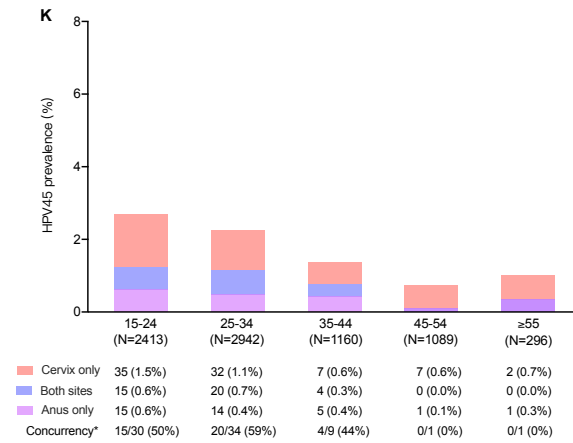
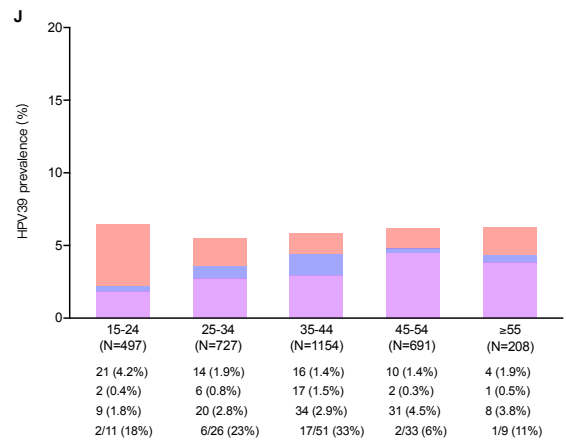
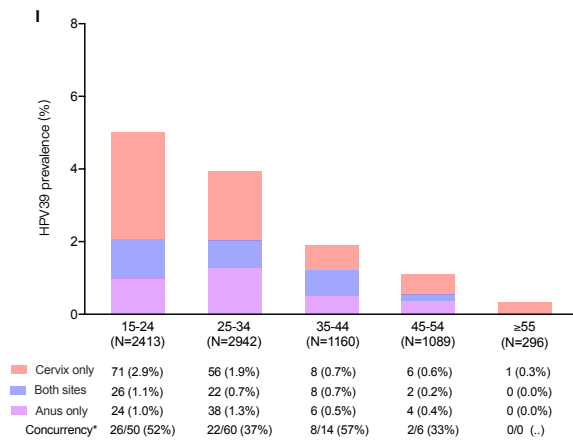
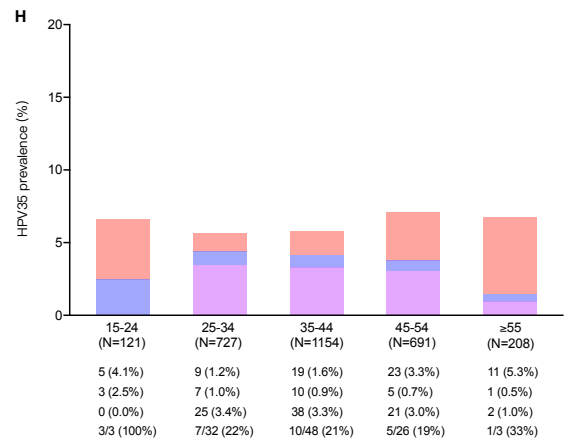
Supplementary Figure S5. Combination of cervical and anal non-HPV16 prevalence in HIV-negative women and women with HIV, according to age group. *Concurrent cervical HPV infection in all women with anal HPV infection.



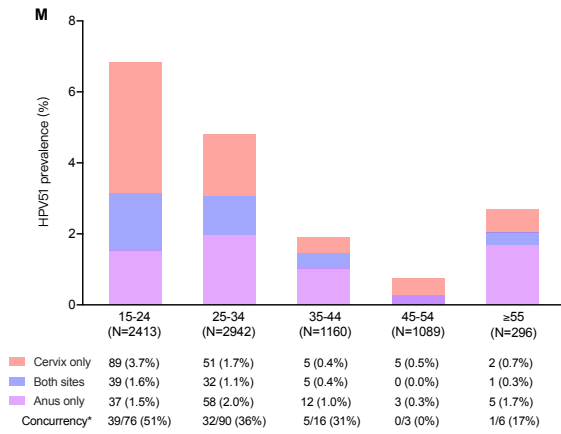
HIV-negative women



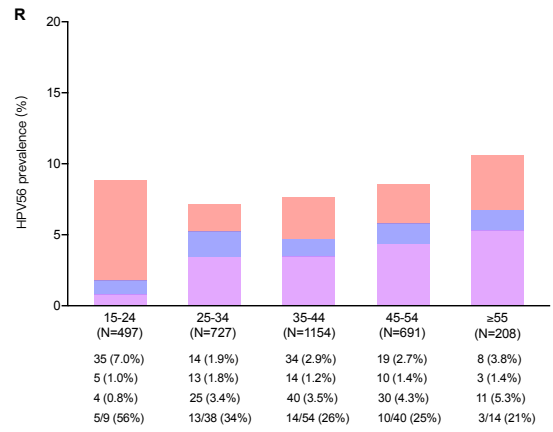
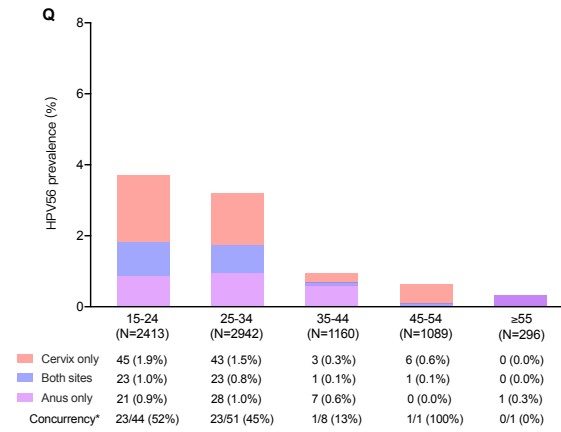
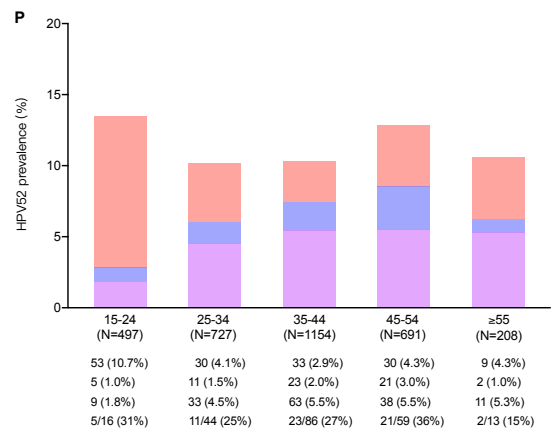
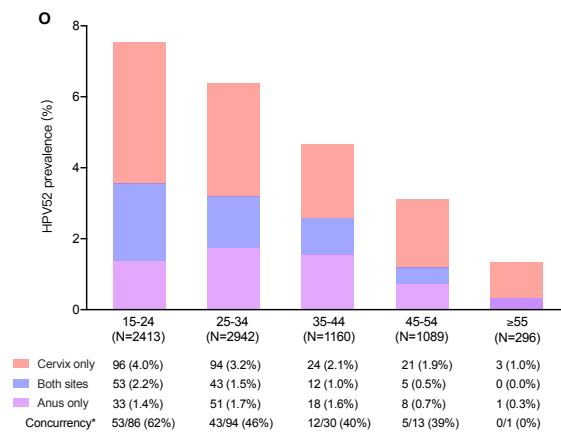
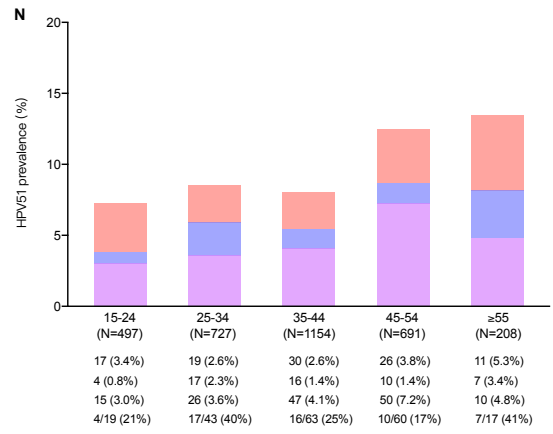
Women with HIV



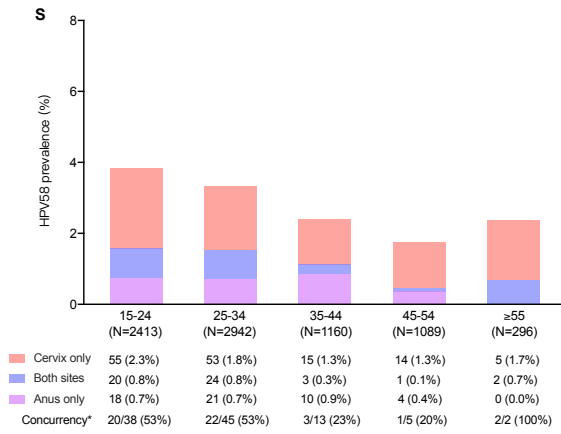
HIV-negative women



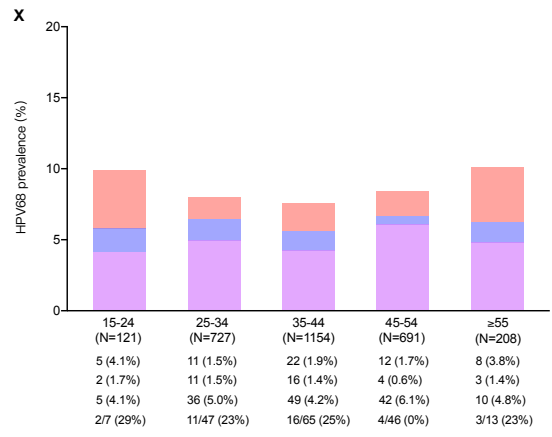
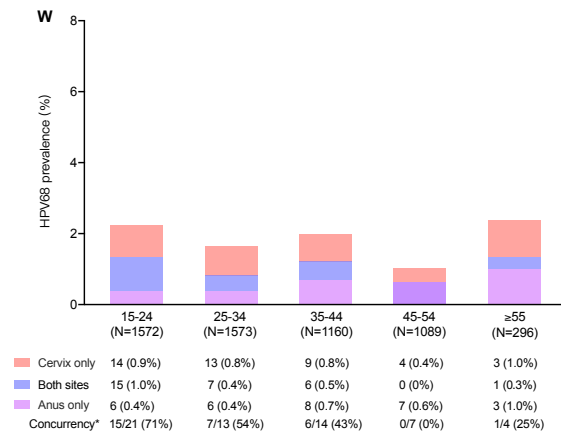
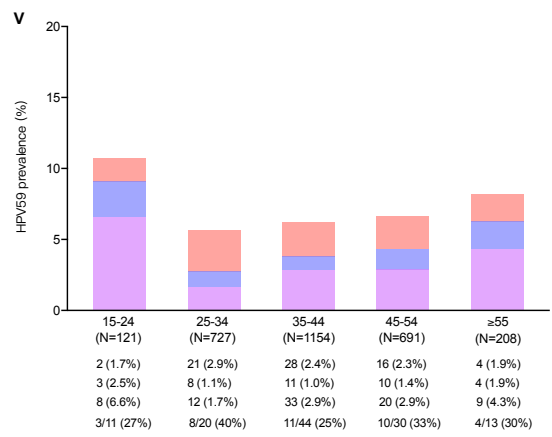
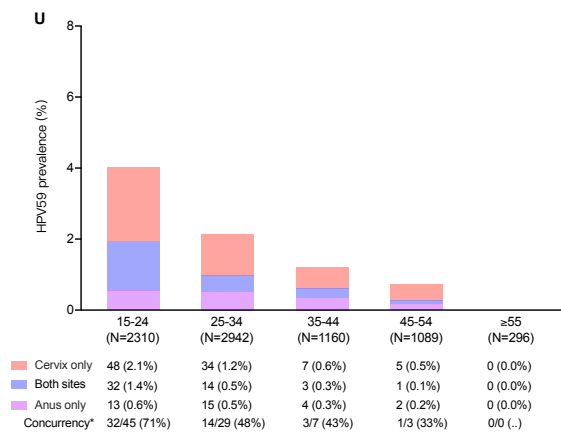
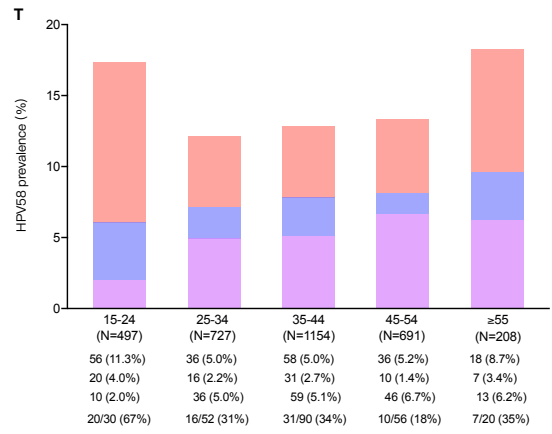
Women with HIV



HIV-negative women



Women with HIV



References

1. Duan R, Zhang H, Wu A, et al. Prevalence and risk factors for anogenital HPV infection and neoplasia among women living with HIV in China. *Sex Transm Infect* **2021**.
2. Morhason-Bello IO, Baisley K, Pavon MA, et al. Prevalence and genotype specific concordance of oro-genital and anal human papillomavirus infections among sexually active Nigerian women. *Infect Agent Cancer* **2021**; 16:59.
3. Rodrigues LLS, Hardick J, Nicol AF, et al. Sexually transmitted infections among HIV-infected and HIV-uninfected women in the Tapajos region, Amazon, Brazil: Self-collected vs. clinician-collected samples. *PLoS One* **2019**; 14:e0215001.
4. de Pokomandy A, Kaufman E, de Castro C, et al. The EVVA Cohort Study: Anal and Cervical Type-Specific Human Papillomavirus Prevalence, Persistence, and Cytologic Findings in Women Living With HIV. *J Infect Dis* **2017**; 216:447-56.
5. Dube Mandishora RS, Christiansen IK, Chin'ombe N, et al. Genotypic diversity of anogenital human papillomavirus in women attending cervical cancer screening in Harare, Zimbabwe. *J Med Virol* **2017**; 89:1671-7.
6. Wei F, Li M, Wu X, et al. The prevalence and concordance of human papillomavirus infection in different anogenital sites among men and women in Liuzhou, China: A population-based study. *Int J Cancer* **2018**; 142:1244-51.
7. Heard I, Poizot-Martin I, Potard V, et al. Prevalence of and Risk Factors for Anal Oncogenic Human Papillomavirus Infection Among HIV-Infected Women in France in the Combination Antiretroviral Therapy Era. *J Infect Dis* **2016**; 213:1455-61.
8. Menezes LJ, Poongulali S, Tommasino M, et al. Prevalence and concordance of human papillomavirus infection at multiple anatomic sites among HIV-infected women from Chennai, India. *Int J STD AIDS* **2016**; 27:543-53.
9. Ortiz AP, Romaguera J, Perez CM, et al. Prevalence, genotyping, and correlates of anogenital HPV infection in a population-based sample of women in Puerto Rico. *Papillomavirus Res* **2016**; 2:89-96.
10. Cambou MC, Luz PM, Lake JE, et al. Anal human papillomavirus (HPV) prevalences and factors associated with abnormal anal cytology in HIV-infected women in an urban cohort from Rio de Janeiro, Brazil. *AIDS Patient Care STDS* **2015**; 29:4-12.
11. Ramautarsing RA, Phanuphak N, Chaithongwongwatthana S, et al. Cervical and anal HPV infection: cytological and histological abnormalities in HIV-infected women in Thailand. *J Virus Erad* **2015**; 1:96-102.
12. Tso FK, Rodrigues CL, Levi JE, Mattosinho de Castro Ferraz MG, Speck NM, Ribalta JC. HPV infection-associated anogenital cyto-colpo-histological findings and molecular typing in HIV-positive women. *Genet Mol Res* **2015**; 14:17630-40.

13. Godbole SV, Mane AK, Chidrawar SR, et al. Prevalence of anal human papillomavirus infection among HIV-infected women from India. *J Acquir Immune Defic Syndr* **2014**; 67:e111-4.
14. Kojic EM, Kang M, Cespedes MS, et al. Immunogenicity and safety of the quadrivalent human papillomavirus vaccine in HIV-1-infected women. *Clin Infect Dis* **2014**; 59:127-35.
15. Moscicki AB, Ma Y, Farhat S, et al. Natural history of anal human papillomavirus infection in heterosexual women and risks associated with persistence. *Clin Infect Dis* **2014**; 58:804-11.
16. Remis RS, Liu J, Loutfy M, et al. The epidemiology of sexually transmitted co-infections in HIV-positive and HIV-negative African-Caribbean women in Toronto. *BMC Infect Dis* **2013**; 13:550.
17. Hernandez BY, Ka'opua LS, Scanlan L, et al. Cervical and anal human papillomavirus infection in adult women in American Samoa. *Asia Pac J Public Health* **2013**; 25:19-31.
18. Hessol NA, Holly EA, Efird JT, et al. Concomitant anal and cervical human papillomavirus V infections and intraepithelial neoplasia in HIV-infected and uninfected women. *AIDS* **2013**; 27:1743-51.
19. Mullins TL, Wilson CM, Rudy BJ, Sucharew H, Kahn JA. Incident anal human papillomavirus and human papillomavirus-related sequelae in HIV-infected versus HIV-uninfected adolescents in the United States. *Sex Transm Dis* **2013**; 40:715-20.
20. Ortiz AP, Romaguera J, Perez CM, et al. Human papillomavirus infection in women in Puerto Rico: agreement between physician-collected and self-collected anogenital specimens. *J Low Genit Tract Dis* **2013**; 17:210-7.
21. Castro FA, Quint W, Gonzalez P, et al. Prevalence of and risk factors for anal human papillomavirus infection among young healthy women in Costa Rica. *J Infect Dis* **2012**; 206:1103-10.
22. Kojic EM, Cu-Uvin S, Conley L, et al. Human papillomavirus infection and cytologic abnormalities of the anus and cervix among HIV-infected women in the study to understand the natural history of HIV/AIDS in the era of effective therapy (the SUN study). *Sex Transm Dis* **2011**; 38:253-9.
23. Goncalves MA, Randi G, Arslan A, et al. HPV type infection in different anogenital sites among HIV-positive Brazilian women. *Infect Agent Cancer* **2008**; 3:5.
24. Hernandez BY, McDuffie K, Zhu X, et al. Anal human papillomavirus infection in women and its relationship with cervical infection. *Cancer Epidemiol Biomarkers Prev* **2005**; 14:2550-6.
25. Moscicki AB, Durako SJ, Houser J, et al. Human papillomavirus infection and abnormal cytology of the anus in HIV-infected and uninfected adolescents. *AIDS* **2003**; 17:311-20.
26. Palefsky JM, Holly EA, Ralston ML, Da Costa M, Greenblatt RM. Prevalence and risk factors for anal human papillomavirus infection in human immunodeficiency virus (HIV)-positive and high-risk HIV-negative women. *J Infect Dis* **2001**; 183:383-91.
27. Lin C, Slama J, Gonzalez P, et al. Cervical determinants of anal HPV infection and high-grade anal lesions in women: a collaborative pooled analysis. *Lancet Infect Dis* **2019**; 19:880-91.