



MONITORING HPV VACCINATION PROGRAM IMPACT IN BHUTAN AND RWANDA

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High HPV vaccine program coverage in Rwanda/Bhutan : importance of school-based delivery

Bhutan: 2010, HPV6/11/16/18, 12 year olds + catch up to 18 years

Coverage in 12 year-olds, by dose:

Year	Primary delivery approach	Estimated 12 year-old target population <i>N</i>	Vaccinated with 1st dose <i>n</i> (%)	Vaccinated with 2nd dose <i>n</i> (%)	Vaccinated with 3rd dose <i>n</i> (%)
2010	School	6706	6666 (99)	6733 (100)	6679 (100)
2011	Health-center	7085	4868 (69) [#]	4231 (60) [#]	4210 (59) [#]
2012	Health-center	7203	6260 (87) [*]	5385 (75) [*]	4851 (67) [*]
2013	Health-center	7231	6094 (84)	5430 (75)	4917 (68)
2014	School	7575	7422 (98)	7330 (97)	7134 (94)

Dorji et al. Vaccine 2015

Rwanda: 2011, HPV6/11/16/18 to primary grade 6 + catch up to secondary grade 3

Coverage in 2011, by vaccination round:

Coverage	Round 1	Round 2	Round 3
Girls vaccinated in school, no.	91 752	89 704	88 927
Girls vaccinated outside school, no.	2 136	3 066	3 180
Total no. of girls vaccinated	93 888	92 770	92 107
Cumulative coverage (%)	95.04	93.90	93.23

coverage in 2011 of girls absent from school, by vaccination round:

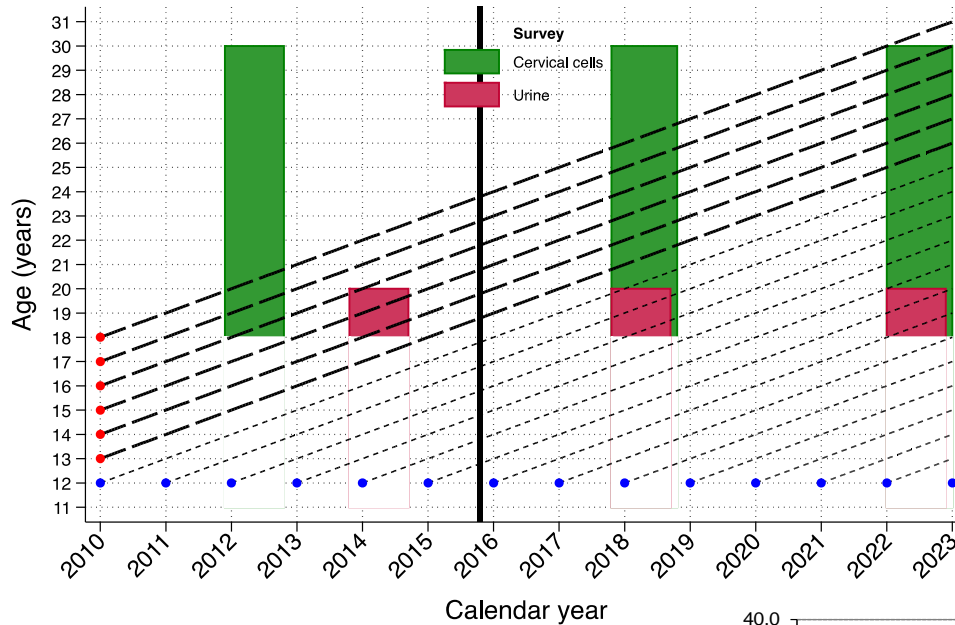
Coverage	Round 1	Round 2	Round 3
Girls vaccinated outside school, no.	2136	3066	3180
Total girls outside school, no.	4651	3679	3734
Coverage of girls outside school (%)	45.93	83.34	85.16

International Agency for Research on Cancer



Binagwaho et al. Bull World Health Organ 2012

Monitoring HPV prevalence in repeat surveys in Bhutan



- Baseline cervical cell survey.**

2012/13

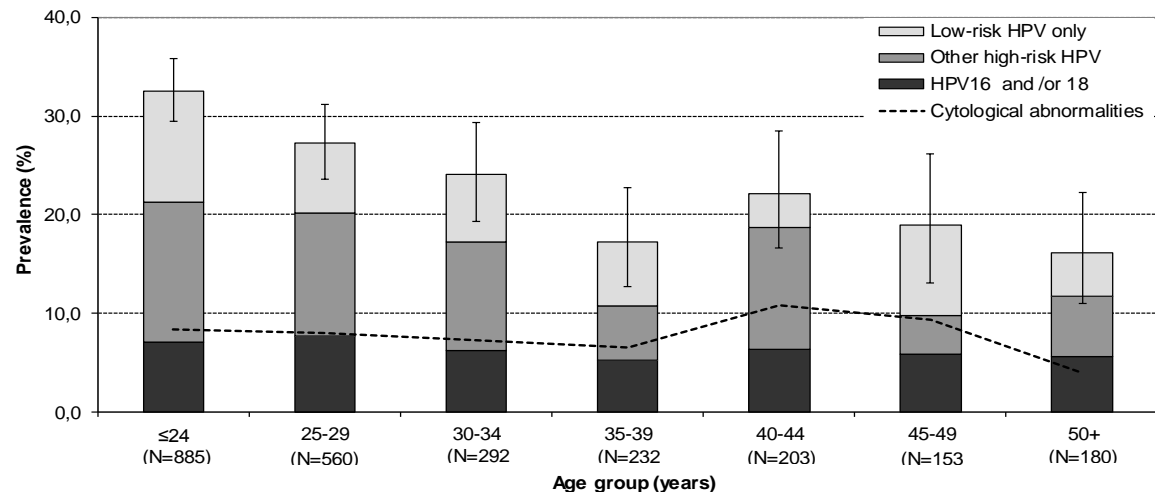
general population

N= 2,505

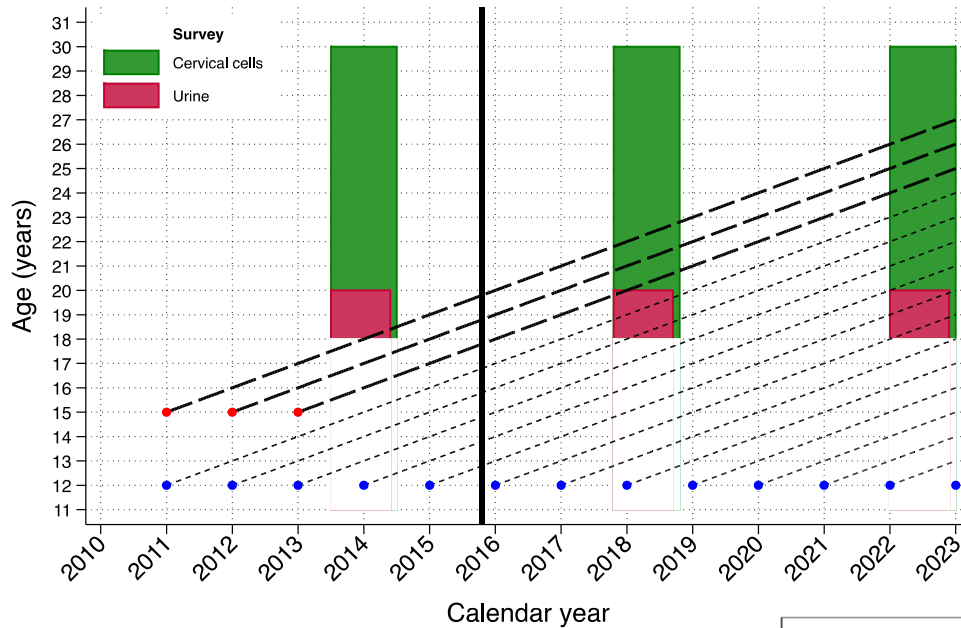
aged 18–69

- Prevalence**

- Any HPV = 26%
- HR-HPV = 18%
- HPV16/18 = 7%



Monitoring HPV prevalence in repeat surveys in Rwanda



• Baseline cervical cell Survey.

2013/14

general population

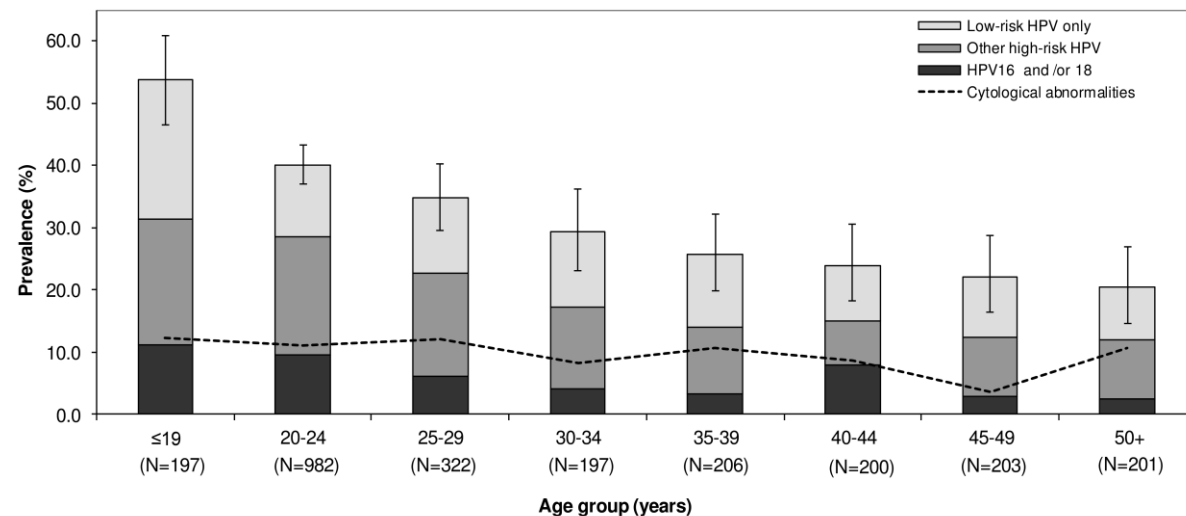
N= 2,508

aged 18–69

20% HIV positive.

• Prevalence

- Any HPV = 34%
- HR-HPV = 22%
- HPV16/18 = 7 %



HPV prevalence monitoring from urine

To obtain earliest indicators of vaccine effectiveness:

- HPV prevalence should be measured in age groups of young women
 - initiating sexual activity
 - still reluctant to accept a gynaecological examination for the collection of cervical cells.
- Urine testing
 - the technical performance has steadily improved
 - is a solution to obtaining a less-invasive sample from a representative group of young women for the monitoring of HPV vaccination.





Early impact: Urine surveys



Urine survey: epidemiological validity

Characteristic	N	Bhutan		N	Rwanda	
		HPV-positive N (%)	Adjusted PR (95% CI)		HPV-positive N (%)	Adjusted PR (95% CI)
All	973	88 (9.0)		912	111 (12.2)	
History of sexual intercourse						
Never	871	59 (6.8)	1	720	51 (7.1)	1
Ever	102	29 (28.4)	4.19 (2.81-6.25)	192	60 (31.3)	4.40 (3.11-6.23)
<i>Chlamydia trachomatis</i>						
Negative	940	69 (7.3)	1	892	98 (11.0)	1
Positive	33	19 (57.6)	7.65 (5.21-11.2)	20	13 (65.0)	3.02 (2.12-4.30)

Urine survey: impact of vaccination

Choice of test for HPV prevalence monitoring from urine :
sensitivity versus specificity ?

Vaccinated	N	HPV6/11/16/18-pos	Adjusted ¹ PR (95% CI)
<u>Rwanda</u>			
GP5+/6+			
No	519	21 (4.1)	1
Yes	393	2 (0.5)	0.12 (0.03-0.51)
E7-MPG (IARC)			
No	519	33 (6.4)	1
Yes	393	11 (2.8)	0.45 (0.23-0.90)

Conclusions

- Monitoring impact is not a pre-requisite to starting an HPV vaccine program, but policy-makers are understandably afraid of investments that take decades to produce accountable results.
- Urine surveys may be a good option for obtaining representative samples of youngest women to show earliest impact, although the pros and cons of test sensitivity versus specificity remain unclear.
- Need to plan early if one is to characterise pre-vaccination cohorts.
- Good coverage data is essential.
- Superiority of school-based delivery.
- Feasibility of a broad catch-up campaign in the first year.

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MoH of Bhutan

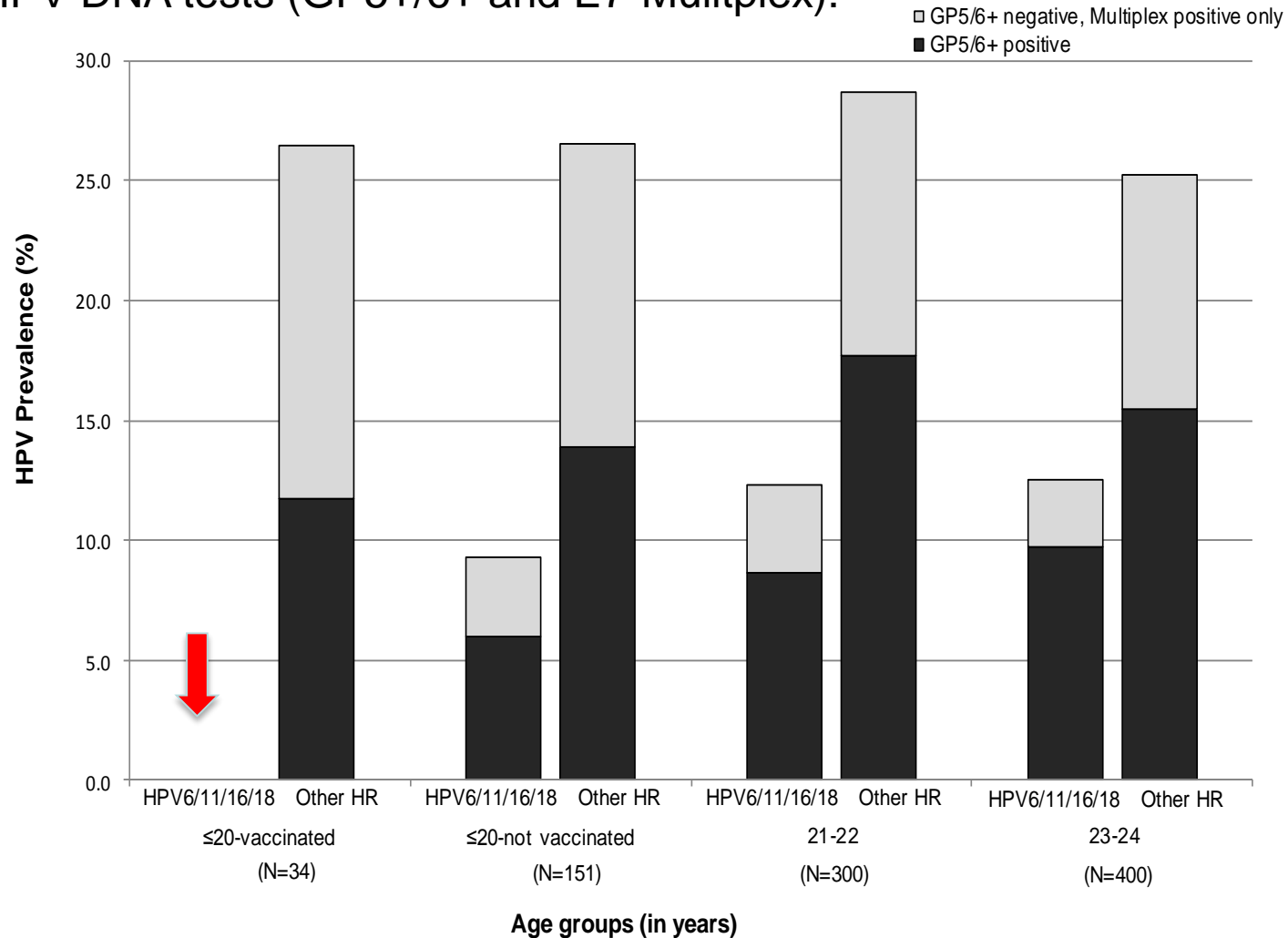
- Dr Ugyen Tshomo

MoH of Rwanda

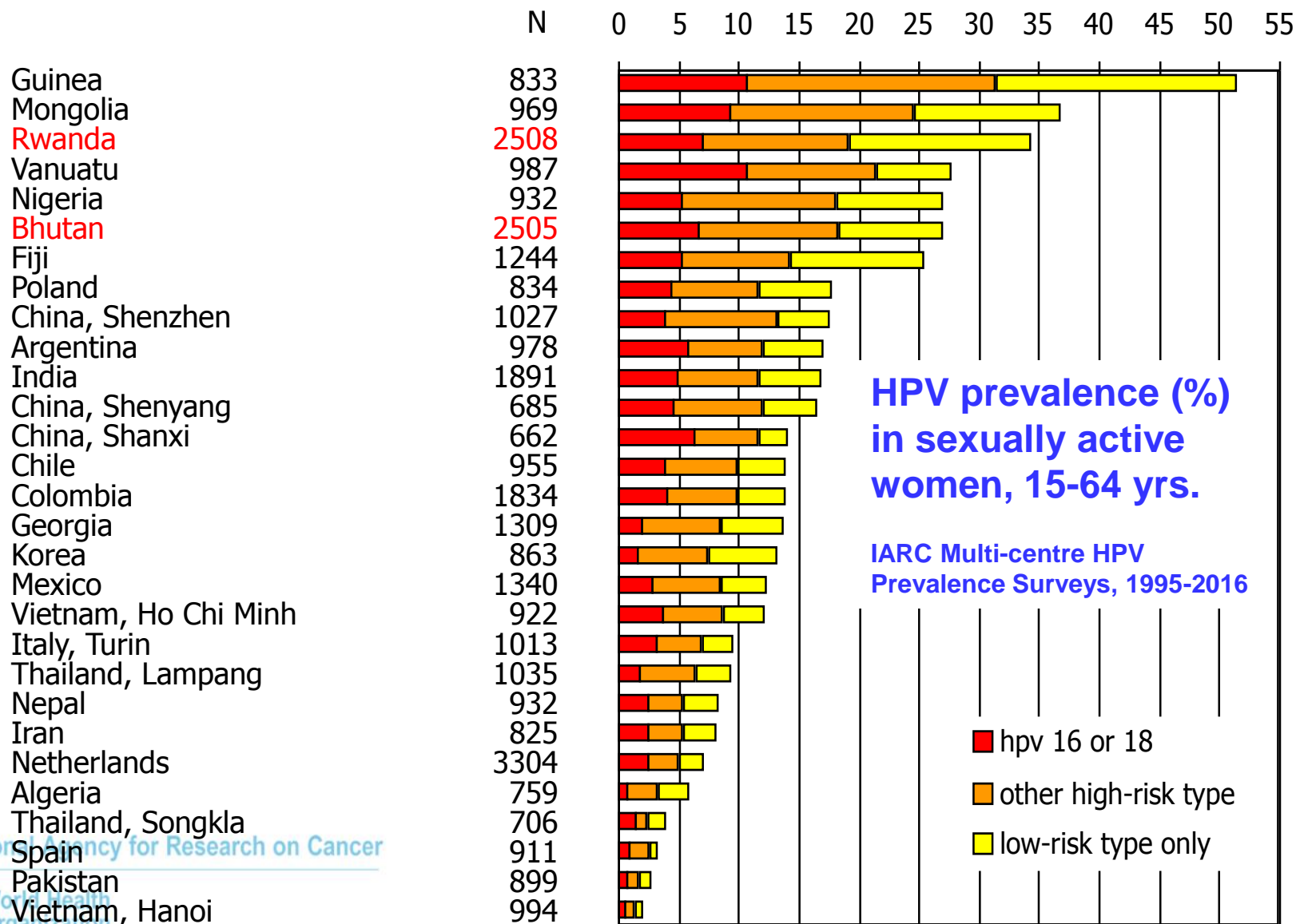
- Dr Fidele Ngabo
- Chantal Umulisa

Monitoring HPV vaccination in Bhutan

Age-specific prevalence of HPV DNA among 885 women <24 years old, according to two HPV DNA tests (GP5+/6+ and E7-Multiplex).

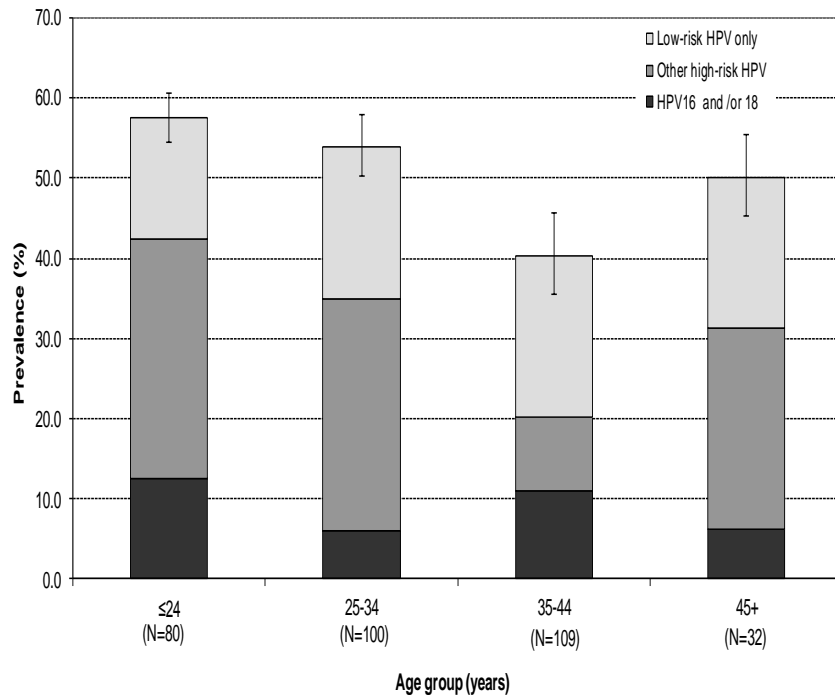


IARC HPV Prevalence surveys



HIV infection is an important determinant of HPV prevalence in Rwanda

321 HIV positive women



918 HIV negative women

