Type-specific HPV prevalence in Kigali, Rwanda

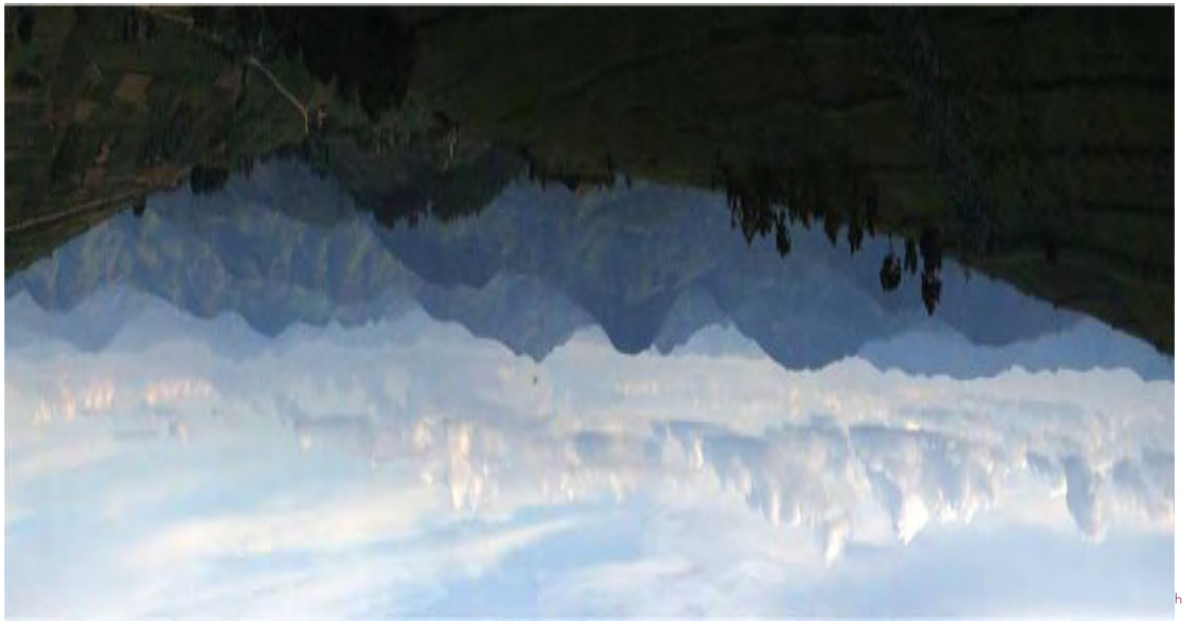
Vyankandondera J [1,2]., Veldhuijzen N[3]., Ingabire C[1], Kestelyn E[1,3]., Mwamarangwe L[1]., Ntirushwa J[1]., Crucitti T[4]., Braunstein S[1,5]., Van de Wijgert J[1,3].

[1]Projet Ubuzima, Kigali, Rwanda; [2]Centre Hospitalier de Kigali/Belgium Technical Cooperation, Kigali, Rwanda; [3]Academic Medical Center (AMC), The Netherlands; [4]Institute of Tropical Medicine (ITM), Antwerp, Belgium; [5]Columbia University, New York, USA

Academisch Medisch Centrum
Universiteit van Amsterdam

Content

- Background
- Study design and objectives
- Results
- Discussion &Conclusions



Relevance of HPV research

- **Causal association of persistent HPV infection with cervical cancer**
  - Persistent HPV16/18 infection: 70% of cervical cancer cases
- **Largest burden of cervical cancer in developing countries**
  - It is the most important factor in the development of cervical cancer that kills 200,000 women a year worldwide
  - Lack of (cytology-based) screening programs
  - HPV-based screening programs may be feasible (*Care*HPV test)
  - **Primary preve ntion possible: two prophylactic vaccines**
  - Gardasil (Merck): quadrivalent (HPV6/11/16/18)
  - Cervarix (GSK): bivalent (HPV16/18)

Relevance of HPV research

- **Limited data on HPV infections from developing countries**
  - Geographical differences in HPV distribution

- **Knowledge about transmission dynamics important to define disease control strategy and to model/measure population impact of preventive measures**
  - Risk factors for persistent infections relatively well established; risk factors for incidence infections not

HPV prevalence

Women with normal cytology:

- Any HPV worldwide: 10.4% (10.2-10.7)*
  - Top 5: HPV 16, 18, 58, 52$
- Any HPV Africa: 22.1% (20.9-23.4)
  - Top 5: HPV 16, 52, 18, 58, 31
  - (EUROGIN2008 update: HPV 16, 52, 58, 18, 31)#
  - Any HPV East Africa: 31.6% (29.5-33.8)
- Any HPV Europe: 8.1% (7.8-8.4)
  - Top 5: HPV 16, 18, 31, 33, 58

** Age-adjusted*

** De Sanjose et al, Lancet Infect Diseases 2007;7(7):453-9; $ X.Bosch et al Vaccine26S(2008(K1-16; # Bruni et al EUROGIN 2008 abstract SS3-6*

Updated meta-analysis on the HPV distribution in women with normal cytology

Bruni et al. EUROGIN2008 (abstract SS3-6)

51% of data from European women

→14% of world population

2.1% of data from African women

→12 % world population

Lack of HPV prevalence data from African countries

Academisch Medisch Centrum
Universiteit van Amsterdam

Objectives

- To estimate the prevalence, incidence, and persistence of type-specific HPV infection
- To determine relationships between HPV and other STIs, vaginal flora (especially BV) and genital inflammation
- To compare the type-specific prevalence of HPV in HIV-negative and HIV-positive women

Academisch Medisch Centrum
Universiteit van Amsterdam

Design

Kigali HIV Incidence Study (KHIS)

- Cross-sectional survey among high risk women (n=800)
- Follow-up cross-sectional survey among HIV positive high risk women (approx 15-18 months after first survey)
- **Prospective cohort study among HIV negative high risk women (n=400)**

Period: October 2006 – June 2009

Academisch Medisch Centrum
Universiteit van Amsterdam

Design – sample collection & processing

Sample collection:

Endocervical brush stirred in PreservCyt medium

Storage at -80°C

Laboratory processing:

Roche Linear Array PCR (Identifies 37 high and low risk HPV types)

In-house PCR for mixed-probe HPV52/33/35/58

Baseline characteristics

Population characteristics	n (%)
Age at enrollment (n=364) (median, IQR)	25 (23-30)
Education (n=367)	
no education	74 (20.2%)
primary school	246 (67.2%)
secondary school	46 (12.2%)
Relationship at enrollment (n=367)	
married	2 (0.5%)
divorced	42 (11.4%)
widowed	39 (10.6%)
never married	284 (77.4%)
Age at sexual debut (n=364)(mean, S.D)	17 (2.8)
Sex worker (n=364)	359 (98.6%)
# sexual intercourse (last month) (n=) (median, IQR)	30 (16-56)
# clients (last 3 months) (N=) (median, IQR)	96 (48-168)

HPV prevalence

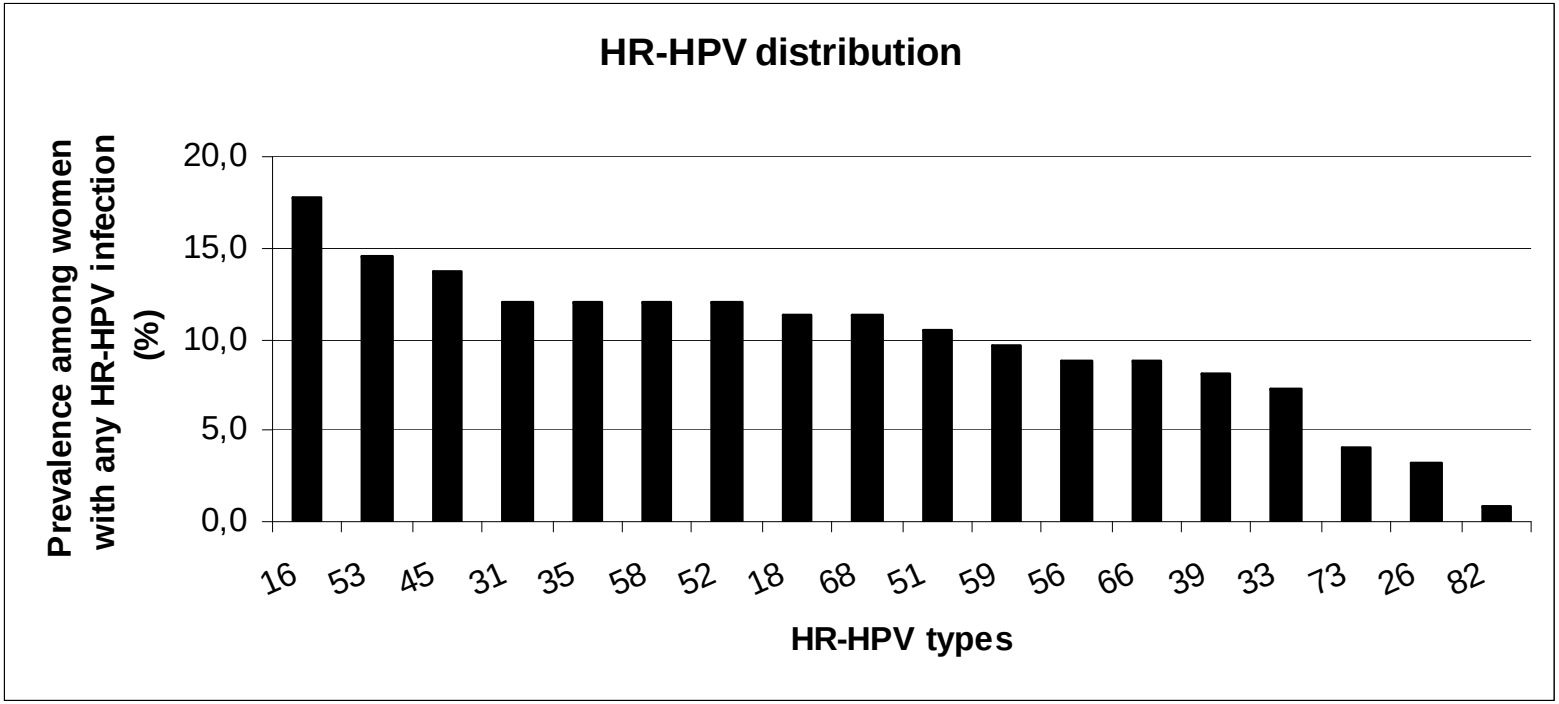
- N=366

N=366	% (N)	95% C.I.
Any HPV	48.1% (176)	43.0-53.2
HR-HPV	33.9% (124)	29.1-38.7
HPV 16/18	9% (36)	6.9-11.9
LR-HPV	32.8% (120)	28.0-37.6

Multiple infection: 27,9%

Classification of HPV acc to Munoz et al (2003)

HR HPV distribution



East African top-10: 16, 52, 58, 45, 18, 35, 66, 31, 53, 42*

**www.who.int/hpvcentre (accessed 13-11-2009)*

HPV distribution: women with cervical lesions

Nr	Cytology result	HPV type detected
1	ASCUS	Neg
2	ASCUS	Neg
3	ASCUS	Neg
4	ASCUS	**18**, 56, 61, 66
5	ASCUS	**18**, 33, 39, 51, 53, 62, 67
6	ASCUS	66, CP6108, 84
7	LSIL	Neg
8	LSIL	**16**, 31, 61, 62, 68
9	HSIL	Neg
10	HSIL	**16**
11	HSIL	33, 71
12	HSIL	**16**, 71
13	HSIL	**18**, 31, 39. 56, 59, 66
14	HSIL	31, 56, 66
15	HSIL	33
16	SCC	58

Association with STIs

Association between HPV and other STIs

	HR-HPV* (n=124)	**LR-HPV (only) (n=52)**	**No HPV (n=189)**	***P*-value**
Gonorrhea #	14/124 (11.3%)	5/52 (9.6%)	9/189 (4.8%)	0.089
Chlamydia #	6/124 (4.9%)	0/52 (0%)	10/189 (5.3%)	0.245
Trichomonas #	19/122 (15.6%)	7/50 (14,0%)	29/189 (15.3%)	0.965
Syphilis #	10/123 (8.1%)	4/52 (7.7%)	12/188 (6.4%)	0.832
HSV-2 $	79/114 (69.3%)	28/48 (58.3%)	102/181 (56.4%)	0.079

*Includes HR-HPV positive women with and without LR-HPV; # missing gonorrhoea (n=1), chlamydia (n=1), trichomonas (n=5) and syphilis (n=3) results excluded;$ missing (n=12) or equivocal (n=11) HSV-2 results excluded

Conclusions

- High overall HPV prevalence in high-risk women in Kigali
- Infections with HR-HPV more prevalent than LR-HPV
- Type specific distribution differs from earlier publications
  - Small sample
  - High-risk population
  - Results from women from general population pending
- Need for data on HPV type-specific distribution among women with intraepithelial lesions/SCC as this may have implication for the effectiveness of prophylactic HPV vaccines based on HPV16 and 18 in this population.

Academisch Medisch Centrum
Universiteit van Amsterdam

Acknowledgements

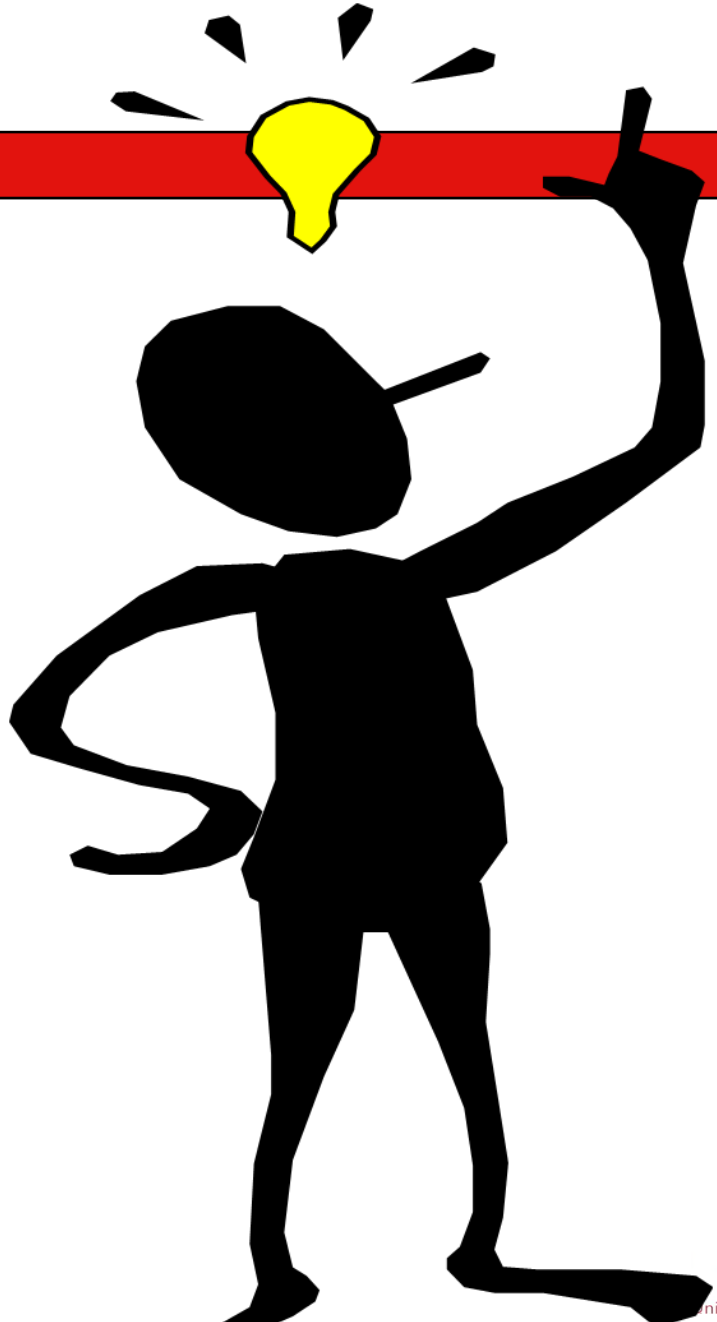
All study participants

KHIS study team at Projet Ubuzima, including community mobilizers
Governing Council of Projet Ubuzima (CHUK, TRACPlus, LNR, CNLS, MoH)
Community Advisory Board of Projet Ubuzima
Institute of Tropical Medicine (ITM), Antwerp

Funding from:
European and Developing Countries Clinical Trial Partnership (EDCTP)
International Partnership for Microbicides (IPM)

Academisch Medisch Centrum
Universiteit van Amsterdam

- Contribution?



Academisch Medisch Centrum
Universiteit van Amsterdam