

HPV based Cervical Cancer screening programs in Cameroon: challenges and opportunities



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Overview of Cameroon

Cameroon (2020)

- ❖ West African Country
- ❖ Population: 26,545,863 people
- ❖ 56.3 % of the population is urban (14,941,523 people in 2020)
- ❖ The median age in Cameroon is 18.7 years.
- ❖ GDP per Capita: 1,530 USD
 - ❖ Lower Middle Income Country
- ❖ Languages
 - ❖ Official: French and English
 - ❖ More than 200 tribes
- ❖ HIV prevalence: 3.7%
 - ❖ 5.0% among females
 - ❖ 2.3% among males

Cameroon



<https://www.worldometers.info/world-population/cameroon-population>.

World Health Organization, 2020

Cervical Cancer in Cameroon

Burden of Cervical Cancer in Cameroon

- ❖ 2nd most common women's cancer after breast cancer (22.4% vs 28.9%)
- ❖ 2nd most deadly women's cancer

Incidence of Cervical Cancer

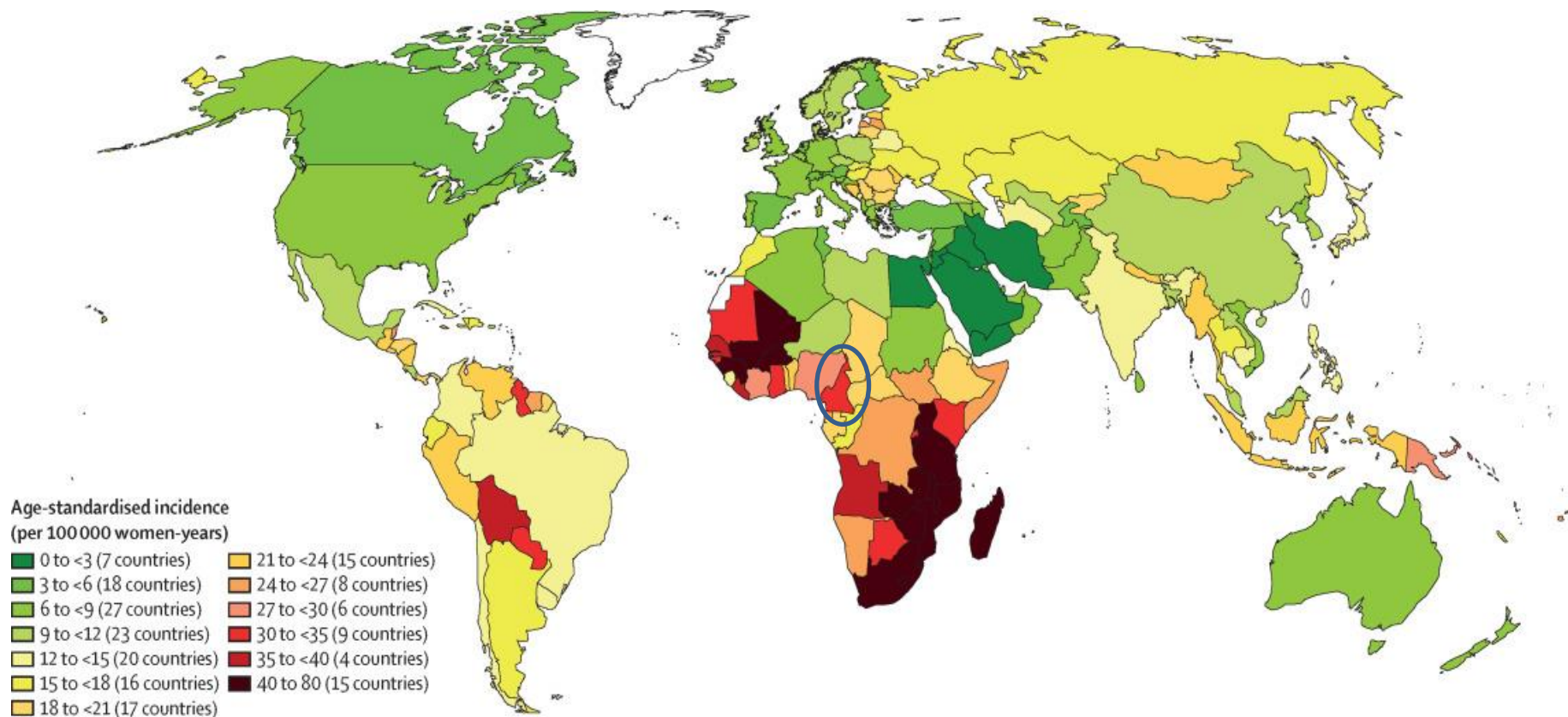
- ❖ ASIR: **30**/100,000 (vs 8.1 in US)
- ❖ ~2000 new cases per year

Mortality from Cervical Cancer

- ❖ ASMR: **17.5**/100,000 (vs 2.4 in US)
- ❖ ~1200 deaths per year



Global burden of Cervical cancer (WHO, 2018)



Globocan 2018

Arbyn et al, Lancet Global Health, 2020

Screening guidelines for cervical Cancer in Cameroon

National Cancer Control Committee of Cameroon

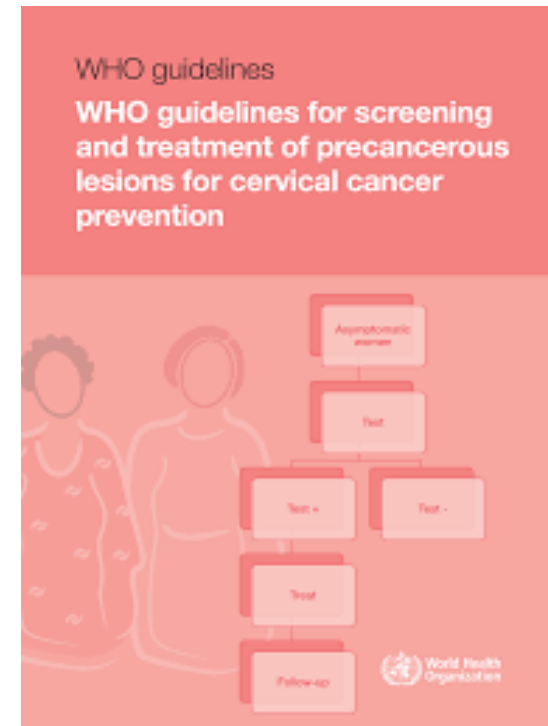
- ❖ Develop, update and coordinate the implementation of national guidelines
- ❖ Consistent with WHO's recommendations
- ❖ Screening tools: Cytology, VIA/VILI, HPV testing
- ❖ Not widely implemented nationwide

Opportunistic Screening

- ❖ Urban cities: Pap test +++, colposcopy and biopsy
- ❖ Rural areas: See-and-treat strategies (VIA/VILI +++)

HPV testing

- ❖ Demonstration Projects
- ❖ Limited Availability



National Cancer Control Committee of Cameroon, 2020

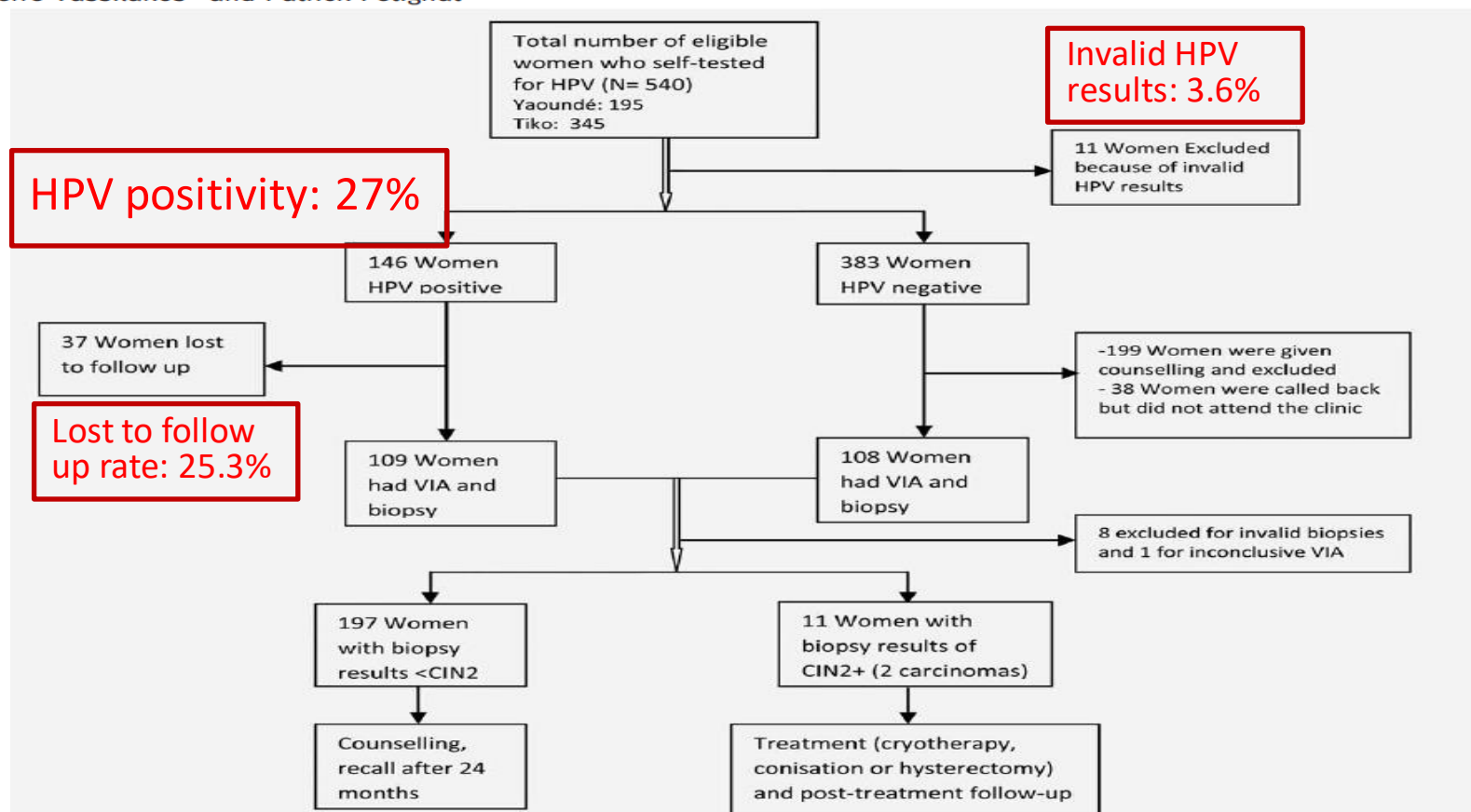
WHO, 2013

Pilot study (2010-2012): HPV self-sampling



Effectiveness of a two-stage strategy with HPV testing followed by visual inspection with acetic acid for cervical cancer screening in a low-income setting

Pierre-Marie Tebeu¹, Joël Fokom-Domgue^{1,2}, Victoria Crofts², Emmanuel Flahaut², Rosa Catarino², Sarah Untiet², Pierre Vassilakos³ and Patrick Petignat²



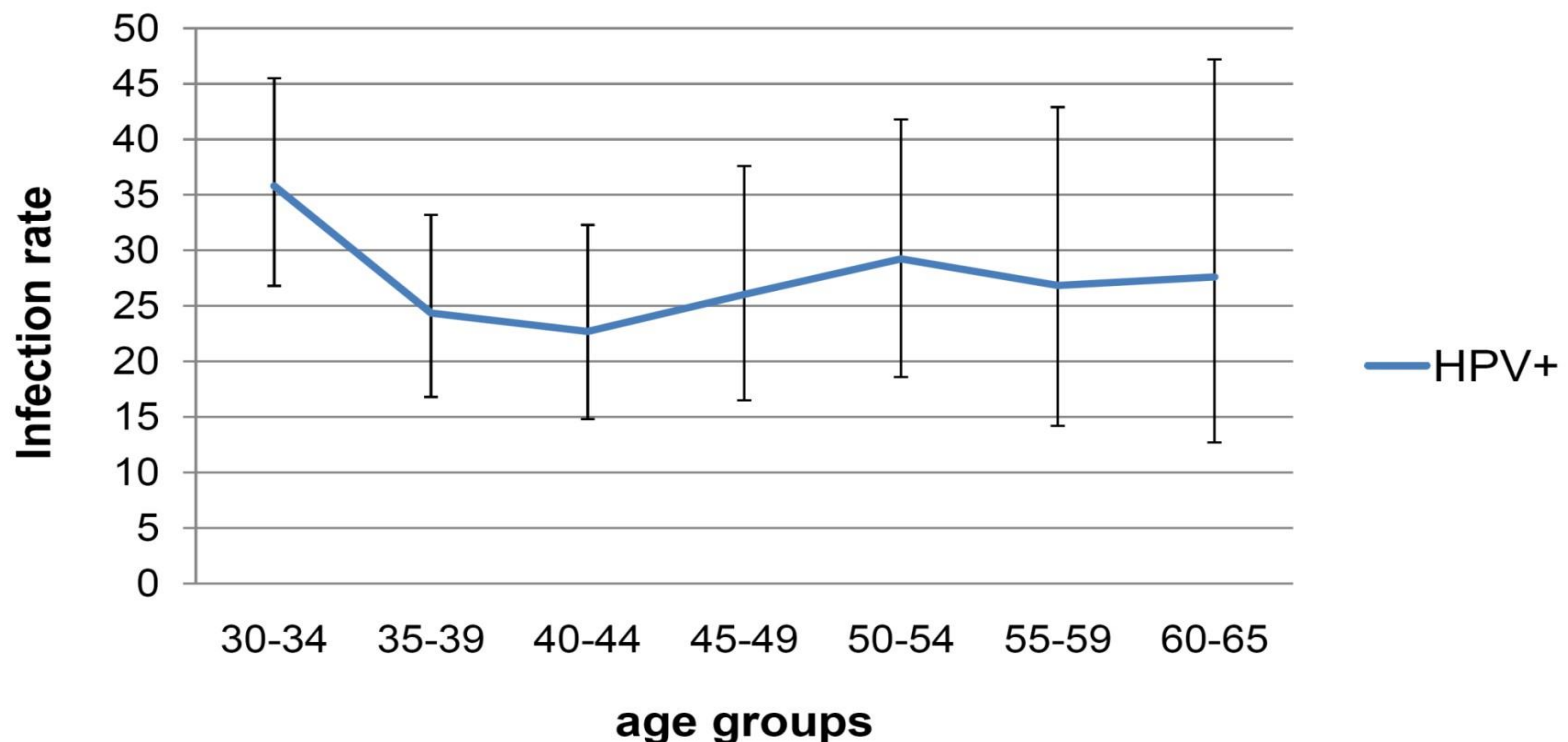
Pilot study (2010-2012): HPV prevalence



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HPV prevalence



Pilot study (2010-2012): screening performance



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Table 3. VIA performance for CIN2+ detection with respect to the HPV status of women

| HPV status | Sensitivity % (95% CI) | Specificity % (95% CI) | PPV % (95% CI) | NPV % (95% CI) |
|------------------------------|-----------------------------|------------------------|------------------|--------------------|
| HPV+ (N = 106) | 36.4 (15.2–64.2) | 87.4 (79.2–92.6) | 25.0 (10.2–49.5) | 92.2 (84.8–96.2) |
| HPV– (N = 102) | Not calculable ¹ | 93.1 (86.5–96.6) | 00.0 (00.0–35.4) | 100.0 (96.1–100.0) |
| Total ² (N = 208) | 36.4 (15.2–64.6) | 90.4 (85.4–93.7) | NA | NA |

¹All CIN2+ were HPV positive.

²All women with interpretable biopsy and VIA results.

Abbreviation: NA: not applicable.

Table 4. Estimated performance for CIN2+ detection of HPV testing as standalone tools and sequential screening (HPV testing and VIA)¹

| | HPV testing alone | HPV testing followed by VIA |
|------------------------|--------------------|-----------------------------|
| Sensitivity % (95% CI) | 100.0 (79.6–100.0) | 33.3 (15.2–58.3) |
| Specificity % (95% CI) | 74.5 (70.6–78.1) | 96.7 (94.8–97.9) |
| PPV % (95% CI) | 10.3 (6.3–16.3) | 22.7 (10.1–43.4) |
| NPV % (95% CI) | 100.0 (99.0–100.0) | 98.0 (96.4–99.9) |

This was one of the first studies worldwide to evaluate the 2013 WHO recommended strategy of HPV testing followed by VIA

Women's Health Program (WHP)

Cervical cancer screening within the WHP

- ❖ Largest cervical cancer prevention program in Cameroon run by the Cameroon Baptist Convention Health Services (CBCHS)
- ❖ Started in 2007 modeled after the Zambia Cervical Cancer Prevention Program
- ❖ 11 stationary clinics in 7 of 10 regions of Cameroon staffed by trained nurses
- ❖ Numerous out reach clinics in rural villages
- ❖ Screened over 100,000 women for cervical cancer and treated over 4,000 women for cervical pre- cancer



Women's Health Program (WHP)

Characteristics of the WHP

- ❖ See-and-treat cervical cancer prevention program using digital cervicography
- ❖ Digital cameras (2007-2016), then smart phones (2016-2020)
- ❖ Uses a fee-for-service model to recover costs, sustainable
- ❖ Screening linked to Treatment with Thermal ablation or LEEP for preinvasive disease
- ❖ Cases suspicious for cancer biopsied and referred to appropriate facilities for further management (radical surgery, chemoradiation)
- ❖ Possible transition to HPV testing as primary screen? (examined since 2015)



Cholli et al, Gynecologic Oncology, 2018

Manga et al, International Journal of Women's Health, 2020

HPV tests used in the WHP - Cameroon

Care HPV (2015-2018)



CareHPV Machine (Qiagen)

- Qualitative detection of 14 high-risk types
 - Requires batches of 90 specimens, takes 3 hours

Ampfire HPV (2020)



Ampfire HPV (Atila Biosystems)

- . Detects 15 high risk HPV types and simultaneously genotypes HPV 16 & 18.
- . Can do genotyping of all 15 high risk HPV and can also test 4 types of STIs (Chlamydia, Gonorrhea, Mycoplasma G and Trichomonas)
- . Requires 1-2 hours to get results
- . Does not require batching
- . High rates of positive results
- . Respect of SOP procedures +++

Pilot: HPV self-testing in rural Cameroon (2016)



IJC

International Journal of Cancer



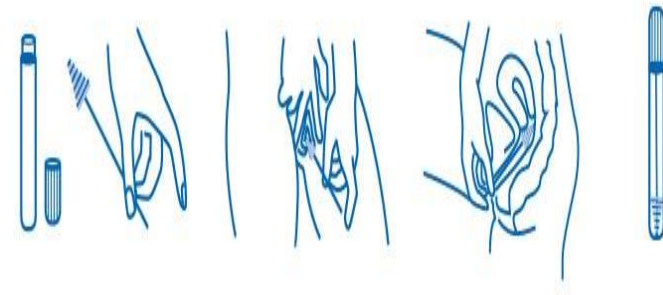
Feasibility of a community-based cervical cancer screening with “test and treat” strategy using self-sample for an HPV test: Experience from rural Cameroon, Africa

Joel Fokom Domgue^{1,2}, Beatrice Futuh³, Calvin Ngalla³, Peter Kakute³, Florence Manjuh³, Simon Manga³, Kathleen Nulah³, Edith Welty³, Kathleen Schmeler¹ and Thomas Welty³

Objectives:

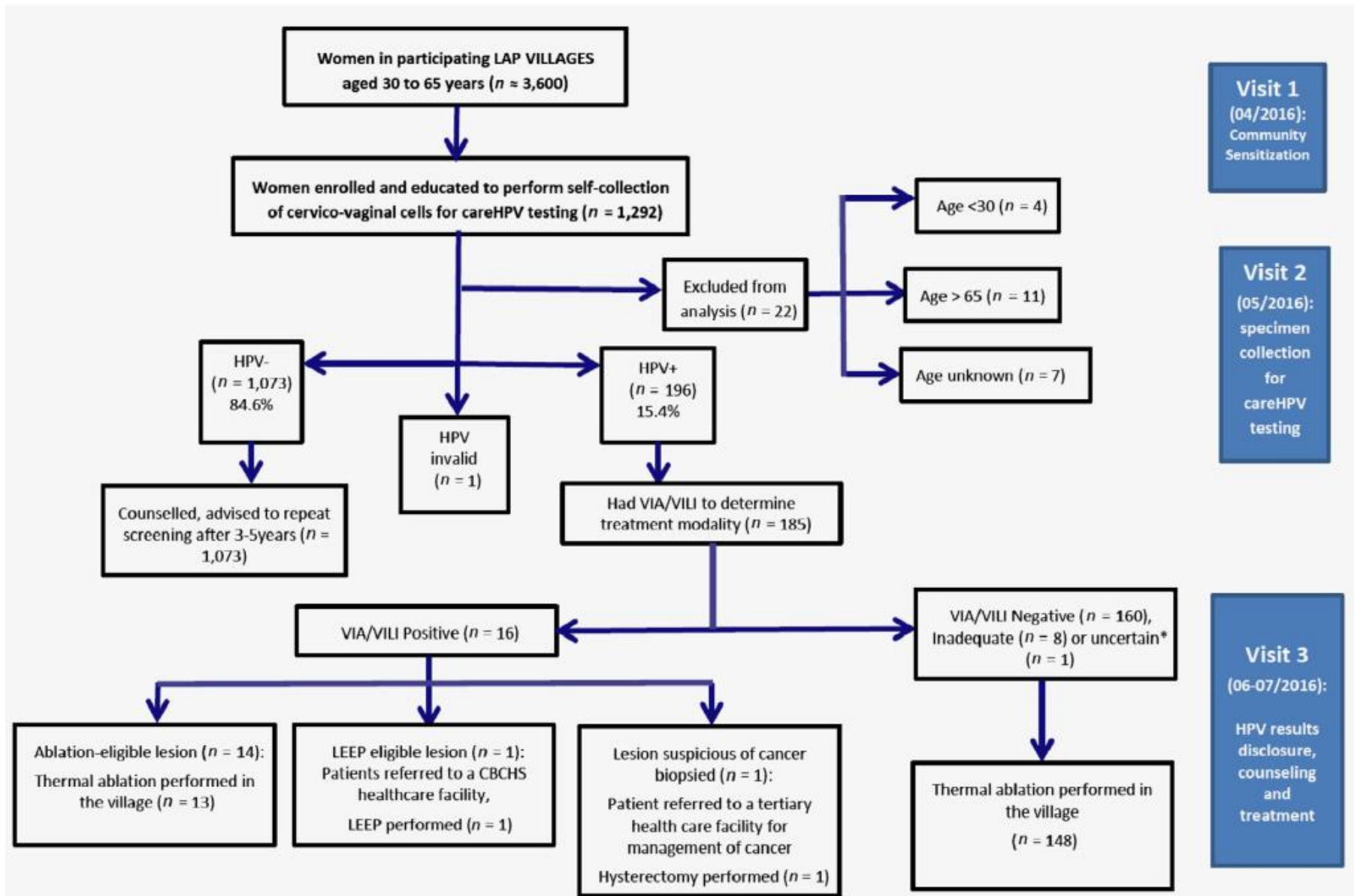
To assess the feasibility of screening & treating women in rural LAP villages with:

- ❖ Self-collected careHPV tests
- ❖ VIA and VILI enhanced by digital cervicography (DC) of HPV positive women to triage to optimal treatment strategy
- ❖ Treatment of all HPV + with thermal coagulation on site or referral for LEEP, surgery, chemoradiation



Feasibility of HPV self-testing in rural Cameroon

Methods: Flowchart



Pilot: HPV self-testing in rural Cameroon (2016)

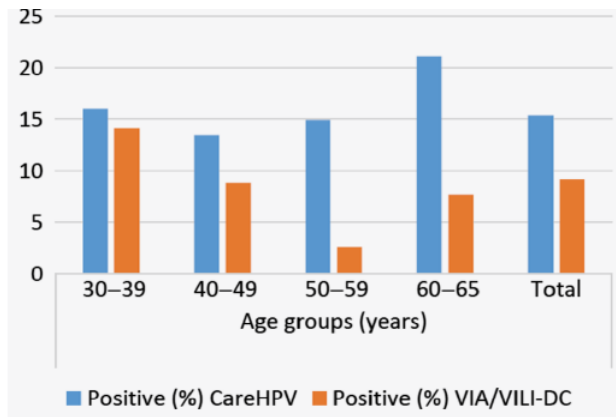


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Prevalence of positive results for HPV test and VIA/VILI-DC in the study population, by age

Results:

- 1,351 women screened by careHPV in the LAP villages
 - Mean age : 45 years
 - **Only 4.7% of women reported having been previously screened for cervical cancer in these rural areas**
 - HIV prevalence: 4.2%
 - 13.4 % of HPV positive women were HIV positive vs 4.4% of HPV negative women (p<0.0001)

Management and complications of self-sampling



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Management:

- ❖ 165 HPV positive (79.3%) were examined:
- ❖ 17 (10.3%) were VIA/VILI positive
 - ❖ 14 cryo-eligible
 - ❖ 2 LEEP eligible
 - ❖ 1 lesion suspicious for cervical cancer
- ❖ 120 (73.2%) treated with thermal coagulation in the villages
 - ❖ 1/2 LEEP eligible lesion treated in a facility with surgical background
 - ❖ 1 suspicious for ICC, biopsy confirmed ICC, treated with NACT followed by surgery in a tertiary healthcare facility

Complications:

- ❖ One woman inserted the cytobrush into her bladder
 - ❖ it broke off
 - ❖ Surgically removed in a higher level health care facility
- ❖ In two women, the cytobrushes broke off in their vaginas
 - ❖ The nurse removed them in the PHCs in the villages
 - ❖ and sent the brushes for HPV testing
- ❖ The woman with ICC died of surgery-related complications



Conclusion

- ❖ Self-sampling and thermal coagulation are well accepted by women in rural Africa
- ❖ Appropriate education on how to perform the procedure is critical
- ❖ Same day testing and treatment is difficult to achieve with careHPV screening in remote and rural villages
- ❖ With community engagement, good sensitization and organized follow up, a high proportion of HPV positive women will come back for further assessment and treatment

THANK YOU!

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