**Appendix B: Additional information for MCDA**

**Survey introduction: Screening and treatment strategies**

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| --- | --- | --- | --- |
| **Number** | **Screening method** | **Treatment option A** | **Treatment option B** |
| **1** | Visual inspection with acetic acid (VIA) | Screening and treatment carried out in a single visit (cryotherapy or LEEP) | Screening and treatment carried out in two separate visits (cryotherapy or LEEP) |
| **2** | Liquid Based Cytology (LBC) | Treatment with cryotherapy (if eligible) or LEEP (if not eligible for cryotherapy) | Treatment with LEEP only |
| **3** | HPV DNA testing | Treatment with cryotherapy (if eligible) or LEEP (if not eligible for cryotherapy) | Treatment with LEEP only |

The first is a strategy using VIA to screen women, and cryotherapy to treat those eligible, and LEEP for those ineligible. The VIA strategy is considered to always have cryotherapy available. The variation on the VIA strategy is to consider the difference in a strategy with screening and treatment on the same day, compared to needing two visits for the strategy.

The next strategy is cytology for screening, with cryotherapy to treat those eligible, and LEEP for those ineligible. The variation on the VIA strategy is to consider the cost effectiveness if there is no cryotherapy available.

The final strategy is HPV DNA testing, with cryotherapy to treat those eligible, and LEEP for those ineligible. The variation on the VIA strategy is to consider the cost effectiveness if there is no cryotherapy available.

The strategies are illustrated in flow charts in the following slides.

**1a. VIA: Single visit (cryotherapy available at screening facility)**

VIA -

**Visit 1**: **Screening Facility**

VIA test

VIA +

Re-screen in 3 years

Eligible: Cryotherapy;

Ineligible: LLETZ;

Repeat VIA in 1 year

Suspicious for cancer: Refer to diagnosis/treatment

**1b. VIA: Two visit (cryotherapy available at screening facility)**

VIA -

**Visit 1**: **Screening Facility**

VIA test

VIA +

Re-screen in 3 years

**Visit 2: Referral facility**

Eligible: Cryotherapy;

Ineligible: LEEP;

Repeat VIA in 1 year

Suspicious for cancer: Refer to diagnosis/treatment

**2a. Pap ASCUS+ (Liquid based cytology), Cryotherapy available**

Pap Normal

**Visit 1**: **Screening Facility**

Pap test

ASCUS+

Re-screen in 3 years

**Visit 2**: **Screening Facility**

Results

**Visit 3**: **Referral Facility**

Colposcopy/Biopsy

Refer to staging/treatment

Cancer

Repeat Pap in 1 year;

if negative:

Re-screen in 3 years

Histology Normal/CIN1

Histology CIN2-3

**Visit 4: Referral Facility**

Treatment with Cryotherapy/LEEP

Repeat Pap in 1 year

**2b. Pap ASCUS+ (LBC), Cryotherapy not available**

Pap Normal

**Visit 1**: **Screening Facility**

Pap test

ASCUS+

Re-screen in 3 years

**Visit 2**: **Screening Facility**

Results

**Visit 3**: **Referral Facility**

Colposcopy/Biopsy

Refer to staging/treatment

Cancer

Repeat Pap in 1 year;

if negative:

Re-screen in 3 years

Histology Normal/CIN1

Histology CIN2-3

**Visit 4: Referral Facility**

Treatment with LEEP;

Repeat Pap in 1 year

**3a. HPV Testing, cryotherapy available**

HPV -

**Visit 1**: **Screening Facility**

HPV test

HPV +

Re-screen in 3 years

**Visit 3**: **Referral Facility**

Eligible: Cryotherapy;

Ineligible: LEEP;

Repeat HPV test in 1 year

Suspicious for cancer: Refer to staging/treatment

**Visit 2**: **Screening Facility**

Results

3b. HPV Testing, cryotherapy not available

HPV -

**Visit 1**: **Screening Facility**

HPV test

HPV +

Re-screen in 3 years

**Visit 3**: **Referral Facility**

Eligible: Cryotherapy;

Ineligible: LEEP;

Repeat HPV test in 1 year

Suspicious for cancer: Refer to staging/treatment

**Visit 2**: **Screening Facility**

Results

Survey question Q2: Reporting evidence

Sources on screening and treatment effectiveness

Firnhaber, C., et al. (2013). "Validation of Cervical Cancer Screening Methods in HIV Positive Women from Johannesburg South Africa." PLoS One 8(1).

Smith JS, Sanusi B, Swarts A, Faesen M, Levin S, Goeieman B, et al. A randomized clinical trial comparing cervical dysplasia treatment with cryotherapy vs loop electrosurgical excision procedure in HIV-seropositive women from Johannesburg, South Africa. Am J Obstet Gynecol [Internet]. 2017;217(2):183.e1-183.e11. Available from: <http://dx.doi.org/10.1016/j.ajog.2017.03.022>

Omenge Orang’o, E., et al. (2017). "Use of visual inspection with acetic acid, Pap smear, or high-risk human papillomavirus testing in women living with HIV/AIDS for posttreatment cervical cancer screening." Aids 31(2): 233-240.

De Vuyst, H., et al. (2014). "Residual disease and HPV persistence after cryotherapy for cervical intraepithelial neoplasia grade 2/3 in HIV-positive women in Kenya." PLoS One 9(10): e111037.

Anderson, J., et al. (2015). "Evaluation of Cervical Cancer Screening Programs in Cote d'Ivoire, Guyana, and Tanzania: Effect of HIV Status." PLoS One 10(9): e0139242.

Omenge Orang’o, E., et al. (2017). "Use of visual inspection with acetic acid, Pap smear, or high-risk human papillomavirus testing in women living with HIV/AIDS for posttreatment cervical cancer screening." Aids 31(2): 233-240.

Sources on screening and treatment costs

Lince-Deroche, N., et al. (2015). "Costs and Cost Effectiveness of Three Approaches for Cervical Cancer Screening among HIV-Positive Women in Johannesburg, South Africa." PLoS One **10**(11): e0141969.

Lince-Deroche N, et al. PLOS ONE Costs and cost-effectiveness of LEEP versus cryotherapy for treating cervical dysplasia among HIV-positive women in Johannesburg, South Africa.

Survey question I1: Current WHO recommendations

HPV testing, cytology and visual inspection with acetic acid (VIA) are all recommended screening tests

New programmes should start screening women aged 30 years or more, and include younger women only when the highest-risk group has been covered. Existing organized programmes should not include women less than 25 years of age in their target populations.

If a woman can be screened only once in her lifetime, the best age is between 35 and 45 years.

For women over 50 years, a five-year screening interval is appropriate.

In the age group 25-49 years, a three-year interval can be considered if resources are available.

Annual screening is not recommended at any age.

Screening is not necessary for women over 65 years, provided the last two previous smears were negative.

Decisions on which screening and treatment approach to use in a particular country or health-care facility should be based on a variety of factors, including benefits and harms, potential for women to be lost to follow-up, cost, and availability of the necessary equipment and human resources

A good screening test should be:

Accurate: the result of the test is correct

Reproducible: repeating the same test will give the same result

Inexpensive: affordable to the health system in terms of both financial and human resources, and to all patients and their families in terms of access to necessary services

Relatively easy: uncomplicated to perform and to provide follow-up care for women with abnormal results

Acceptable: well tolerated by both the patient and the provider

Safe: the test procedure and management of screen-positive subjects have no or minimal adverse effects

Available: accessible to the entire target population.

Women should be offered the same cervical cancer screening and treatment options irrespective of their HIV status.

Colposcopy is recommended only as a diagnostic tool and should be performed by properly trained and skilled providers.

Precancer should be treated on an outpatient basis whenever possible. Both cryotherapy and the loop electrosurgical excision procedure (LEEP) may be suitable for this purpose, depending on eligibility criteria and available resources.

Histological confirmation of cervical cancer and staging must be completed before embarking on further investigations and treatment.

Survey Question I3: Improvement of efficacy/ effectiveness

Reduction in lifetime cervical cancer risk and cervical cancer mortality

|  |  |  |
| --- | --- | --- |
| **Strategy** | **Percent reduction in lifetime risk of cervical cancer** | **Percent reduction in lifetime risk of cervical cancer mortality** |
| VIA (1 visit) | 47.0% | 52.6% |
| VIA (2 visit) | 42.4% | 49.1% |
| Cytology (Cryo/LEEP) | 35.0% | 44.0% |
| Cytology (LEEP) | 47.2% | 53.1% |
| HPV (Cryo/LEEP) | 50.3% | 54.9% |
| HPV (LEEP) | 61.2% | 63.4% |

VIA – Visual inspection with acetic acid

HPV – Human papillomavirus

Cryo – Cryotherapy

Survey Question I6: Public health interest

Average annual number of HIV-positive women screened and treated, cancer cases found (estimated for 2017-2021)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Strategy** | **Number screened** | **Results requiring treatment** | **Treatment administered** | **Successful treatment** | **Unsuccessful treatment** | **Total cancer cases treated** |
| Current policy  |  303,946  |  37,537  |  27,121  |  23,324  |  3,797  |  8,768  |
| VIA (1 visit) |  967,101  |  258,234  |  251,649  |  67,388  |  25,725  |  6,636  |
| VIA (2 visit) |  967,101  |  258,234  |  219,499  |  59,061  |  22,156  |  6,807  |
| Cytology (Cryo/LEEP) |  967,101  | 103,703  |  86,293  |  62,752  |  23,541  |  6,312  |
| Cytology (LEEP) |  967,101  |  103,703  |  86,293  |  74,212  |  12,081  |  6,084  |
| HPV (Cryo/LEEP) |  967,101  |  333,650  |  129,814  |  71,495  |  26,820  |  6,162  |
| HPV (LEEP) |  967,101  |  333,650  |  283,602  |  84,551  |  13,764  |  5,893  |

VIA – Visual inspection with acetic acid

HPV – Human papillomavirus

Cryo – Cryotherapy

Average cost per woman for each strategy (2017 USD)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Strategy** | **Screening cost** | **Additional diagnostics** | **Treatment cost\*** | **Total provider costs** | **Patient costs** | **Total societal cost** |
| VIA (1 visit) | 3.24 | 0 | 10.55  | 13.79 |  6.40 |  20.19  |
| VIA (2 visit) | 3.24 | 0 | 10.55  | 13.79 |  12.80  | 26.59  |
| Cytology (Cryo/LEEP) | 16.81 | 54.25 | 10.55  | 81.61 | 19.20  | 100.81  |
| Cytology (LEEP) | 16.81 | 54.25 | 56.38  | 127.44 | 19.20  | 146.64  |
| HPV (Cryo/LEEP) | 45.35 | 0 | 10.55  | 55.90 |  12.80  | 68.70  |
| HPV (LEEP) | 45.35 | 0 | 56.38  | 101.73 | 12.80  | 114.53  |

\*Treatment cost in based on 83% eligibility for cryotherapy, where used