ELIMINATION OF CERVICAL CANCER AS A GLOBAL PUBLIC HEALTH PROBLEM

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GROWING INEQUITIES AND PUBLIC HEALTH THREAT OF CERVICAL CANCER (GLOBOCAN 2018)

Worldwide in 2018:
570,000 new cases
311,000 deaths

almost 460,000 deaths by 2040
WHO LIFE COURSE APPROACH TO CERVICAL CANCER CONTROL

**Primary Prevention**

- Girls 9-14 years
  - HPV vaccination
- Girls and boys, as appropriate
  - Health information and warnings about tobacco use
  - Sexuality education tailored to age & culture
  - Condom promotion/provision for those engaged in sexual activity
  - Male circumcision

**Secondary Prevention**

- Women > 30 years of age
  - “Screen and treat” – single visit approach
    - Point-of-care rapid HPV testing for high risk HPV types
    - Followed by immediate treatment
    - On site treatment

**Tertiary Prevention and Palliative Care**

- All women as needed at any age
  - Treatment of invasive cancer:
    - Surgery
    - Radiotherapy
    - Chemotherapy
  - Palliative care
MAY 2018: WHO DIRECTOR-GENERAL’S CALL TO ACTION TO ELIMINATE CERVICAL CANCER
More than 70 countries supported the decision for WHO secretariat to develop a:

Global Strategy towards the Elimination of Cervical Cancer
The Dahlem Workshop in March 1997 discussed the hierarchy of possible public health interventions with infectious diseases


http://www.who.int/bulletin/volumes/84/2/editorial10206html/en/
**CONTINUUM OF CONTROL, ELIMINATION AND ERADICATION**

Reduction in incidence, prevalence, morbidity or mortality to a locally acceptable level

of disease: incidence reduced to zero in a defined geographical area

of infection: incidence of infection caused by a specific agent reduced to zero.

as a public health problem: achievement of clear and commonly agreed target definitions

 Continuation of intervention measures needed

Eradication

Permanent reduction to zero of the worldwide incidence of infection

Intervention measures no longer needed
Elimination as a public health problem is a term related to both infection and disease. **It is defined by achievement of measurable global targets set by WHO in relation to a specific disease.** When reached, continued actions are required to maintain the targets and/or to advance the interruption of transmission. The process of documenting elimination as a public health problem is called validation.

KEY QUESTIONS THAT MUST BE ADDRESSED

What will the cervical cancer threshold be to achieve elimination as a public health problem?

What combination of screening and vaccination strategies can lead to elimination? (for different thresholds)

When could elimination be reached, for different strategies and countries?

What is the most efficient/cost-effective strategy to reach elimination?
VARIABILITY IN CERVICAL CANCER INCIDENCE RATES BY WORLD REGION
SYSTEMATIC COMPARATIVE MODELING APPROACH

- **Model Selection**
  - Dynamic model
  - Model includes vaccination & screening
  - Independent model that has been peer reviewed/published

- **Step 1**: Understand Model differences/ Potential for elimination
  - Use selected models from Step 0
  - Examine 14 simplified screening & vaccination scenarios
  - Selection of calibrated countries
  - Compare model structures & results

- **Step 2**: Examine key questions for a selected set of countries
  - Use the selected models
  - Examine 26 realistic screening & vaccination scenarios
  - Model a wider range of countries

- **Step 3**: Estimate global model predictions
  - Use 3 of 4 selected models
  - Examine 3 screening & vaccination scenarios
  - Estimate global predictions

- **Step 4**: Economic analysis
  - Use 3 of 4 selected models
  - Examine the cost & cost-effectiveness of elimination

- **Policy 1 Model**
  - Lead: Karen Canfell
  - Team: Kate Simms, Adam Keane, Megan Smith
  - Institution: Cancer Council NSW, Australia

- **Harvard Model**
  - Lead: Jane Kim
  - Team: Emily Burger, Stephen Sy, Catherine Regan
  - Institution: Harvard, USA

- **HPV-ADVISE Model**
  - Lead: Marc Brisson
  - Team: Mélanie Drolet, JF Laprise, Dave Martin, Élodie Bénard, Guillaume Gingras, Iacopo Baussano, Marie-Claude Boily, Mark Jit
  - Institution: U Laval, Canada; Imperial College, UK; LSHTM, UK; IARC, France

- **Spectrum Model**
  - Leads: Chaitra Gopalappa & Carel Pretorius
  - Institution: U Massachusetts & Avenir Health, USA
SYSTEMATIC COMPARATIVE MODELING APPROACH IN 2018

• Model Selection
  – Dynamic model
  – Model includes vaccination & screening
  – Independent model that has been peer reviewed/published

• Step 1: Understand Model differences/ Potential for elimination
  – Use the selected models
  – Examine 14 simplified screening & vaccination scenarios
  – Few countries
  – Compare model structures & results

• Step 2: Examine key questions for a selected set of countries
  – Use the selected models
  – Examine 26 realistic screening & vaccination scenarios
  – Wider range of countries

• Step 3: Estimate global model predictions
  – Use 3 of 4 selected models
  – Examine 3 screening & vaccination scenarios
  – Estimate global predictions

MARCH

April & May

June & July

August & September
VACCINATION AND SCREENING SCENARIOS

• **S1 - Scenario 1:**
  – Girls-only vaccination (90% coverage, 9-14 yr old)
  – No change in Screening

• **S2 - Scenario 2:**
  – Girls-only vaccination (90% coverage, 9-14 yr old)
  – 1 lifetime screen at 35 yrs old
  – High Screening ramp-up (45%, 70%, 90% in 2023, 2030, 2045, respectively)

• **S3 - Scenario 3:**
  – Girls-only vaccination (90% coverage, 9-14 yr old)
  – 2 lifetime screens at 35 and 45 yrs old
  – High Screening ramp-up (45%, 70%, 90% in 2023, 2030, 2045, respectively)

• **All scenarios:**
  – Screening: HPV testing, 100% treatment efficacy, 10% Lost to follow-up
  – Vaccine: Lifelong duration, 100% efficacy, HPV16/18/31/33/45/52/58
PATHWAYS TOWARDS ELIMINATION WITH GIRLS VACCINATION AND TWICE LIFE TIME HPV TESTING

**Graph:**
- Girl vaccination and 2-life time screening (S3)
- **Cervical Cancer incidence** (per 100,000)
- **X-axis:** Year (2020-2140)
- **Y-axis:** Cervical Cancer incidence
- **Countries:**
  - East Asia & Pacific
  - Europe & Central Asia
  - Latin America & Caribbean
  - Middle East & North Africa
  - South Asia
  - Sub-Saharan Africa
- **Thresholds:**
  - Elimination Threshold 1
  - Elimination Threshold 2

**Source:** M. Brisson, J. Kim & K. Canfell et al. In publication
INCREASING ACCESS TO INTERVENTIONS 2030 VACCINATION, SCREENING & TREATMENT COVERAGE TARGETS

Control: Targets of 90/70/90

Elimination by 2085 / 2090

Elimination at 4 / 100,000

Cervical cancer cases/100,000

2020  2030  2060  2120
VISION: A world without cervical cancer

THRESHOLD: All countries to reach < 4 cases 100,000 women-years

2030 CONTROL TARGETS

90% of girls fully vaccinated with HPV vaccine by 15 years of age

70% of women screened with a high precision test at 35 and 45 years of age

90% of women identified with cervical disease receive treatment and care

SDG 2030: Target 3.4 – 30% reduction in mortality from cervical cancer

The 2030 targets and elimination threshold are subject to revision depending on the outcomes of the modeling and the WHO approval process.
92 Countries included HPV vaccine in the national immunization programme
Feb 2019
Reported HPV vaccine coverage of various ages, 2014-2016

90% coverage is achievable, but challenging for most countries
Countries Introducing Screening with HPV Testing and VIA Testing

Global Progress in **HPV DNA** Testing for Cervical Cancer Screening Status: June 2019

- Countries introducing screening with HPV testing and VIA testing

Global Progress in **Visual Inspection (VIA)** for Cervical Cancer Screening Status: June 2019

- Countries introducing VIA for cervical cancer screening

Data sources: Cervical Cancer Action, HPV Information Centre, Chrysostomou 2018, Personal communications

**Work in progress, some geographical regions not fully updated**
Cervical cancer screening: proportion of women between 30 – 49 screened for cervical cancer at least once

Source: WHO STEPS
Strategy towards the elimination of cervical cancer as a global public health problem: key outputs

1. Guiding principles: life course and public health approach, social justice and equity, integrated people-centered health services

2. Accelerators

   - Increased coverage of HPV vaccination
   - Increased coverage of screening & treatment of pre-cancer lesions
   - Increased coverage of diagnosis & treatment for invasive cancer and palliative care

3. Accelerators
ORGANIGRAM: TAKING FORWARD THE ROADMAP OF ACTIVITIES AND STAKEHOLDER COORDINATION

Secretariat
Chair: Dr Simelela

WHO: dedicated staff; working group representatives and Regional Offices
UN Agencies: IAEA, IARC, UNAIDS, UNFPA, UNWomen, UNICEF

- Impact Modeling, Costing and Financing
- Increasing access to Vaccines
- Increasing access to Screening and Treatment
- Increasing access to Cancer Management
- Monitoring and Surveillance
- Research

Engagement with private sector
TOWARDS CERVICAL CANCER ELIMINATION STRATEGY: TIMELINE

Elimination Targets Proposed

March 27
1st Technical Experts’ Meeting
- Working definition of elimination
- Working indicators and targets
- Validation exercise

June 14-15
Model Comparison Meeting
- 26 modelling scenarios were agreed on

July 17-18
2nd Technical Experts’ Meeting
- Updated working definition of elimination
- Updated working indicators and targets
- Input on key elements in draft acceleration plans
- Technical Experts’ Group Meeting Report

Sept 3-4
Technical Stakeholder Consultation
- Feedback on draft acceleration plan
- Present plans to create working groups

Sept 24
IVIR-AC
- Review working definition of elimination
- Review inputs in draft acceleration plan

Oct 24
SAGE
- Feedback on draft acceleration plan

Dec 2018
Working Group Meetings
- Revise Roadmap: activities up to WHA 2020
- Coordination for implementation

Jan-Feb 2019

Draft “Acceleration Plan” Development

Developed and reviewed to provide strategies to achieve the targets
TOWARDS CERVICAL CANCER ELIMINATION STRATEGY: TIMELINE

**Global Consultation**
- May 13-15: African regional consultation
- June 18-20: Eastern Mediterranean regional consultation
- June 24-26: Western Pacific regional consultation
- June 27-28: South East Asia regional consultation
- Aug 01-02: Americas regional consultation

**WHO Governing Bodies Meetings**
- Aug-Sept: RCM agenda item
- Jan 2020: Executive Board Meeting

**May 2020:** World Health Assembly