A brief overview of IARC and its contribution to education and training and implementation of new screening technologies

International Agency for Research on Cancer
Lyon, France

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IARC - an international effort to combat cancer

IARC is the specialized cancer Agency of WHO, established in May 1965 following an initiative by French leading personalities supported by General de Gaulle, who proposed the idea that advanced nations could unite to curb the growing global health threat posed by cancer.
The boundaries shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of IARC concerning the legal status of any country, territory, city or area of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.
IARC
Cancer research *for* cancer prevention

Providing the scientific evidence-base for prevention

“A catalyst to progress”
Age-standardized rates (worldwide) of all cancer cases among both sexes in 2012 attributable to infections (all infectious agents), by country.

The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.

Data source:
Plummer, de Mariel et al. (2016)
Map production: IARC
World Health Organization

http://gco.iarc.fr/infections/home
Plummer et al, Lancet Glob Heath 2016
Evaluation of less than 3 doses of HPV vaccination in India

Frequency of incident and persistent HPV 16 and 18 infections in vaccinated women by dose regime and in unvaccinated women

<table>
<thead>
<tr>
<th>HPV vaccine dose(s) received</th>
<th>HPV incidence*</th>
<th>HPV persistence**</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Women assessed (n=5075)</td>
<td>Women with incident infections n (%)</td>
</tr>
<tr>
<td>3 doses (Days 1,60,180)</td>
<td>1008</td>
<td>9 (0.9)</td>
</tr>
<tr>
<td>2 doses (Days 1,180)</td>
<td>1028</td>
<td>8 (0.8)</td>
</tr>
<tr>
<td>A single dose</td>
<td>1558</td>
<td>22 (1.4)</td>
</tr>
<tr>
<td>Vaccinated group (total)</td>
<td>3594</td>
<td>39 (1.1)</td>
</tr>
<tr>
<td>Unvaccinated group</td>
<td>1481</td>
<td>88 (5.9)</td>
</tr>
</tbody>
</table>

* Among participants with ≥ one sample tested
** Among participants with ≥ two samples tested

Supported by the Bill & Melinda Gates Foundation
Vaccines provided by Merck

Randomised Trial of 2 versus 3 doses of HPV vaccination in India

Geometric mean MFI avidity index of HPV 16, 18, 6 and 11 L1 antibodies at 18 months after the first dose among girls who received vaccination per protocol, and those who did not have their complete vaccine schedules.

Sankaranarayanan et al., Lancet Oncol. 2016;17(1):67-77

Supported by the Bill & Melinda Gates Foundation

Vaccines provided by Merck
Comparative efficacy of visual inspection with acetic acid, HPV testing and conventional cytology in cervical cancer screening: a randomized intervention trial in Osmanabad District, Maharashtra State, India

Cumulative incidence and mortality among screen-negative women in the cervical cancer screening study in Osmanabad District, India during 2000-2014

![Cumulative Incidence for screen negative women](chart1)

![Cumulative Mortality for screen negative women](chart2)

In collaboration with TMC, Mumbai and NDMCH, Barshi, India
Quick Clinical Reference Chart for Visual Inspection of the Oral Cavity to Detect Precancerous Lesions and Invasive Cancers

Homogeneous leukoplakia with central fissuring in the left buccal mucosa.

Non-homogeneous leukoplakia (ulcerated leukoplakia) left buccal mucosa with an ulcerated area in the centre (thin arrow) surrounded by white patches and note the tobacco induced pigmentation anteriorly (thick arrow).

Non-homogeneous leukoplakia (nodular leukoplakia) right margin of the tongue; note the white nodules (thin arrow) on an erythematous base (thick arrow).

Non-homogeneous leukoplakia (verruccous leukoplakia) hard palate: a diffuse white patch can be seen involving the left and middle portions of the hard palate with warty projections.

Erythroplakia right buccal mucosa: note the red, velvety oval lesion.

Restricted mouth opening in a patient with oral submucous fibrosis (SMF); note the blanching and extensive depapillation of the tongue.

Homogeneous leukoplakia on the right lateral margin of tongue from which a proliferative growth is seen arising posteriorly; biopsy from this area confirmed the presence of a well differentiated squamous cell carcinoma.

Ulcereated leukoplakia left lateral margin tongue with nodular areas which biopsy showed squamous cell carcinoma.

Nodular leukoplakia in the left lateral margin of the tongue harbouring a proliferative growth.

Verrucous leukoplakia with invasive oral cancer at the centre of the lesion (arrow) where a growth can be appreciated, indicating malignant transformation of the leukoplakia.

Erythroplakia of the lower lip; note the crusting extending to the vermilion border (thick arrows) which on biopsy revealed well differentiated squamous cell carcinoma.

Submucous fibrosis of the tongue with surface nodularities (thin arrows) and multiple, proliferative surface growths (thick arrows) which on biopsy showed well differentiated squamous cell carcinoma.

Lichen planus in the right buccal mucosa: note the annular rings (thin arrow) with raised white Wickham's striae (thick arrow).

Traumatic ulcer (arrow) in the right lateral margin of tongue caused by irritation of the dorso-lingual cusps of the mandibular canine teeth.

Traumatic ulcer with malignant transformation left lateral margin tongue; note the ulcerative lesion with rolled out borders caused by chronic irritation from the root stumps of the left mandibular 2nd premolar and 1st molar teeth.

Exophytic proliferative growth in the left lateral margin of the tongue; note the co-existing depapillation of the tongue.

Advanced ulceroproliferative invasive oral cancer in the right lateral margin of the tongue; note the co-existing submucous fibrosis.

Malignant melanoma left buccal mucosa: note the hyperpigmented patch with nodular areas.
The Thailand Colorectal Cancer Screening (CRC) Pilot Demonstration Project in Lampang Province

Goals

• Evaluate the acceptability, feasibility, organization, implementation, monitoring and evaluation of CRC screening in the general population in Thailand by integrating the programme into the existing public health services

• Inform and guide the eventual scaling up of CRC screening to cover the entire country

In collaboration with the:

National Cancer Institute Thailand
Multicentric study of cervical cancer screening and triage with HPV testing - The ESTAMPA study

Evaluation of new strategies and biomarkers for triage of HPV positive women in cervical cancer screening

- 50,000 women 30-64y to be HPV-screened
- HPV positives (14.4%, to date) referred for diagnosis and treatment
- All HPV+ve women referred for triage; expected 500 CIN3+ cases, gold standard for triage methods: VIA, cytology, HPV genotyping, E6/E7 oncoproteins, p16/Ki67
- Network of Latin American investigators
- Local health systems and funding
- Extensive training of staff

Planned ancillary studies:
- Psychosocial impact of HPV screening
- HPV screening cost-effectiveness

Platform for implementation of HPV-based screening:
- Outreach & follow-up strategies
- Introduction of HPV testing & QA system
- Standardisation of diagnostic procedures

Progress to date
- >18,000 women HPV-screened in 11 centres
- 91% HPV positives with colposcopy
- Precancer prevalence: 0.9% (140 CIN3+)

International Agency for Research on Cancer

World Health Organization
REACH Bhutan: rural HPV screening

- Cross-sectional study (3,648 women invited; aged 30-60 yrs) in 15 rural Basic Health Units (BHU); self-sampling for HPV DNA testing

Travel time, range: 5 minutes to 2 days

The challenge is not only screening but also the capacity to treat pre-cancerous lesions
Education and Training

• Training linked to research

• Pre- and post-doctoral fellowships
  – IARC post-doctoral fellowships – with a focus on LMI Cs
  – bilateral partnerships e.g. with Cancer Council Australia and Irish Cancer Society, Norwegian Research Council

• Senior Visiting Scientists for exchanges with established researchers

• Training courses focused on cancer registration, epidemiology, biostatistics, screening and early detection
IARC – an influential publications programme
Institutional rankings: benchmarking

“Mapping Scientific Excellence” is an independent international comparison of scientific publication output quality based on two indicators:

• Best paper rate (10% most cited publications in their subject area)
  IARC was ranked 21\textsuperscript{st} out of 1676 institutions in the ‘Medicine’ category, i.e. in the top 1.3% worldwide

• Best journal rate (ratio of papers published in top 25% of subject area)
  IARC was ranked 31\textsuperscript{st} out of 1676 institutions in the ‘Medicine’ category, i.e. in the top 1.8% worldwide

http://www.excellencemapping.net
Collaborative project between:
Max Planck Society, ETH Zurich/MUG and SCImago