THE SOCIETY OF OBSTETRICIANS AND GYNAECOLOGISTS OF CANADA
LA SOCIÉTÉ DES OBSTÉTRICIENS ET GYNÉCOLOGUES DU CANADA

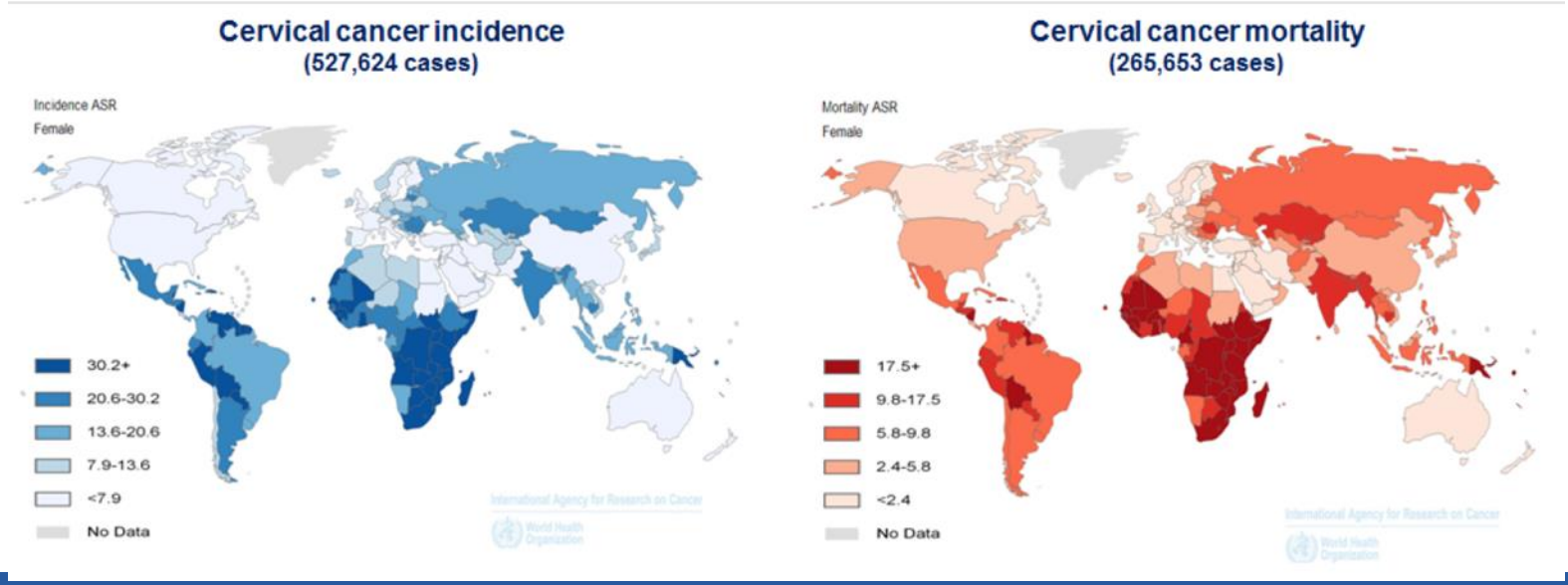
Cervical Cancer Elimination

A Once in Forever Opportunity

Jennifer Blake MD MSc FRCSC

Cervical Cancer

- Second most common Cancer in women
- 2nd in Canadian women aged 20-44
- Inequitable, high mortality



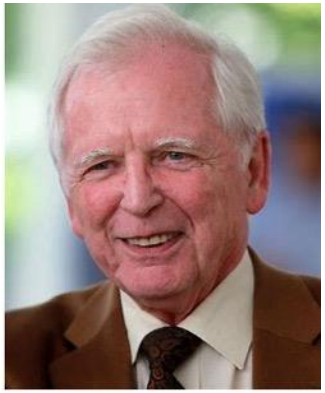
Elimination of Cervical Cancer, 2018

The Secretary General of the WHO, Tedros Gebreysus, "I made a commitment to support the global elimination of cervical cancer.

We have the tools to turn that commitment into a reality...we also have the political commitment.”

The History is Long, and Short

- 1713: B Ramazzini, Nuns have virtually none
- 1842 Rigoni Stern, Cervical cancer rates in married women, widows and prostitutes
- 1974 ZurHausen, HPV causes cervical cancer
- 2006 HPV quadrivalent vaccine
- 2007 HPV bivalent
- 2014 nonavalent vaccine



Australian Leadership

Janette Hoard

- First Lady, Janette Howard had cancer of the cervix
- Ian Fraser, leading scientist

- School based programme
- Coverage for total eligible cohort
- Global leaders in vaccination

Ian Fraser

Canadian Leadership

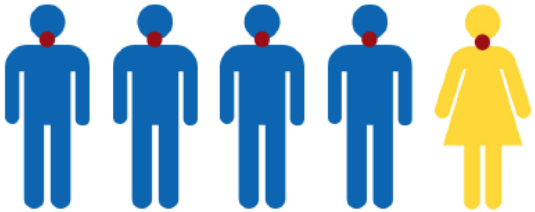
- 2006 Federal government funded provinces to initiate HPV vaccination
  - School based programmes for girls established in all provinces and territories
  - School-based, publicly funded programmes work
- 2013 Coverage expanded to boys

Canadian Leadership

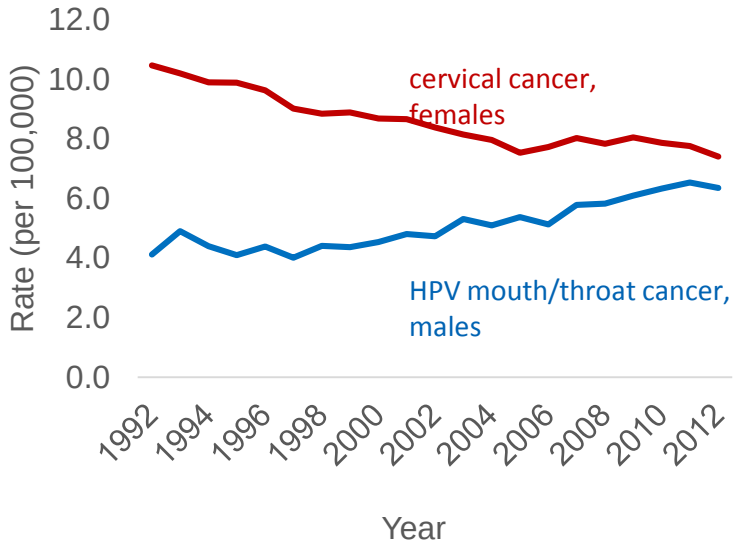
- Leading research in vaccination protocols
- Leading research on screening
- Achieving real results much faster than anticipated with safe and effective vaccine
- On the path to elimination

Mouth and Throat Cancer

- Between 1992 and 2012, rates increased 17% in females and 56% in males
- 4 in 5 cases are in males



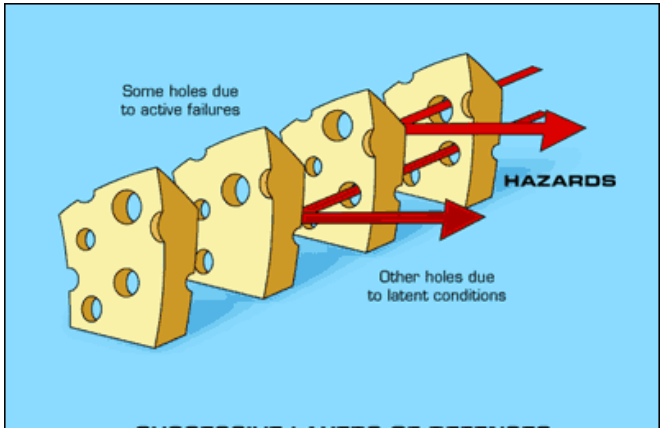
- Set to surpass cervical cancer



Why Cervical Cancer?

It is only caused by HPV, and is detectable before it becomes cancer, so we can:

1. Vaccinate against 90% of cancer causing HPV
2. Screen for the disease before it becomes cancer
3. Treat before it becomes cancer

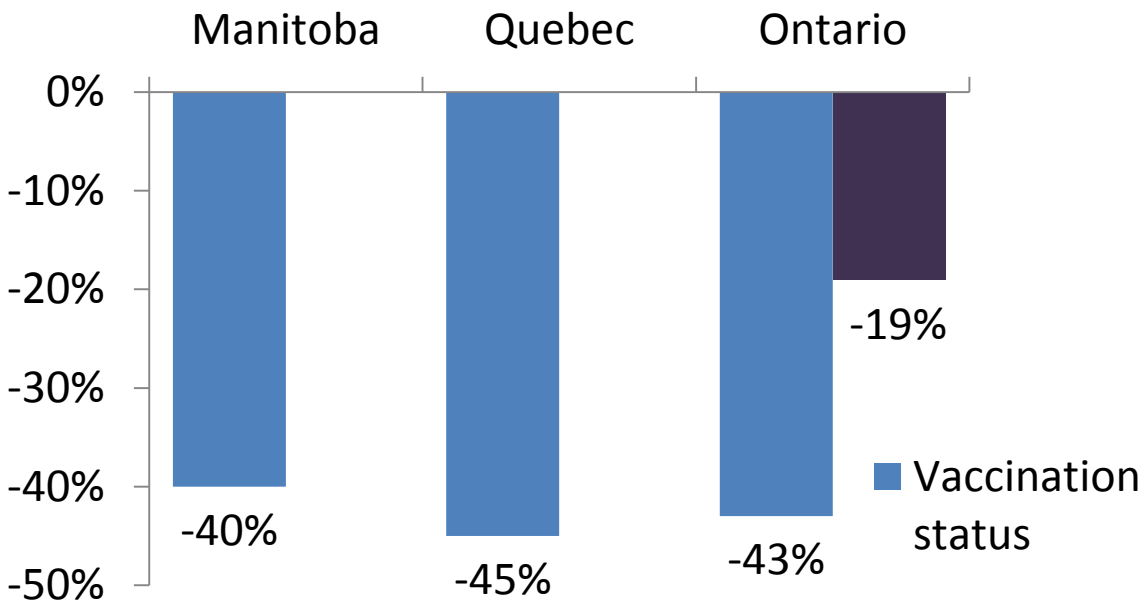


Where are we today, in Canada?

- Today we can chart the course to eliminate cervical cancer, with a marked reduction in other cancers caused by HPV

How are we Doing?

Impact on Genital Warts 2006-2016

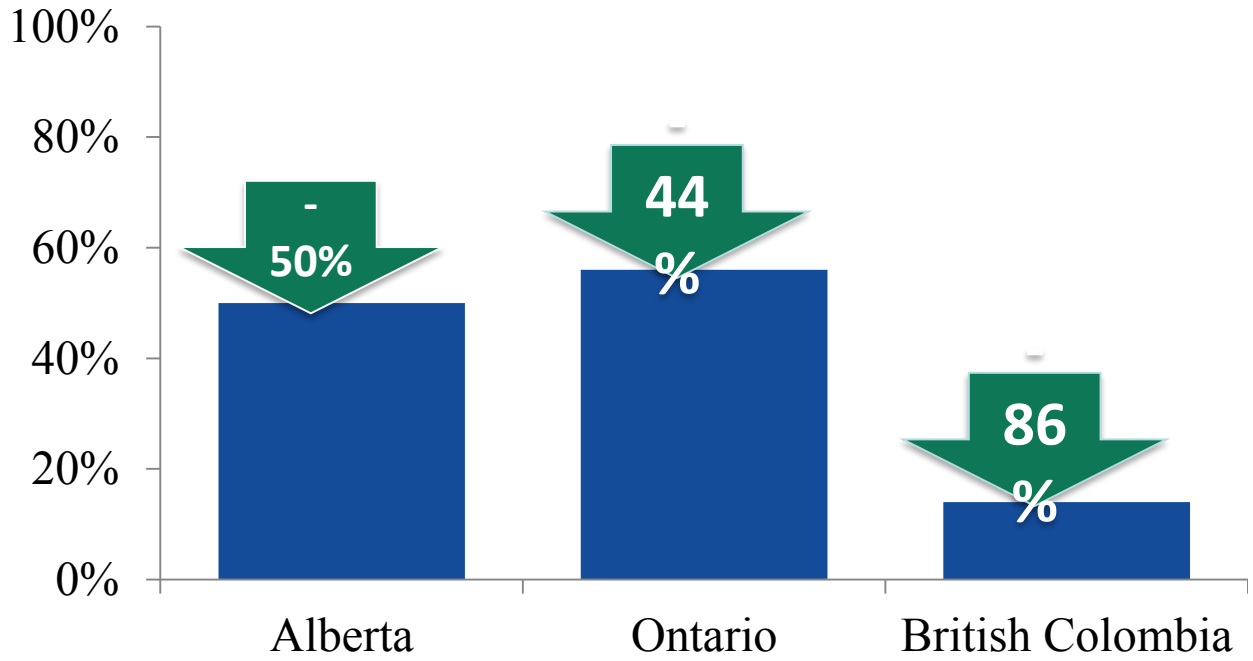


Quebec: Steben, M. et al. Abstract presented at IPV, Seattle, USA, Aug. 21-25, 2014
Ontario: Smith, L. et al. Pediatrics 2015; 135:1131-1140
Manitoba: Willows, K. et al. Abstract presented at the GOC 37th AGM meeting. Vancouver. June 16-18, 2016

How are we Doing?

Impact on abnormal cervical lesions

Cervical dysplasia reduction in Canadian girls:



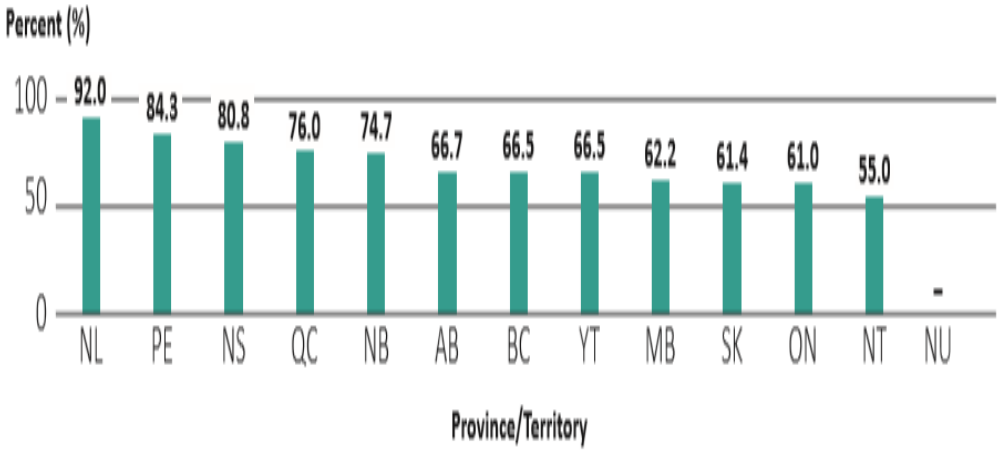
Alberta: Kim, J. et al., CMAJ 2016, 188(12):e281-8
Ontario: Smith, L. et al. Pediatrics 2015; 135:1131-1140
British Columbia: Ogilvie, GS et al. Int. J. Cancer 2015;137:1931-1937

What will it take?

1. Vaccination
   - Target 90%
- Australian model assumed
   - Nonavalent vaccine
   - Uptake 82% in girls and 76% in boys

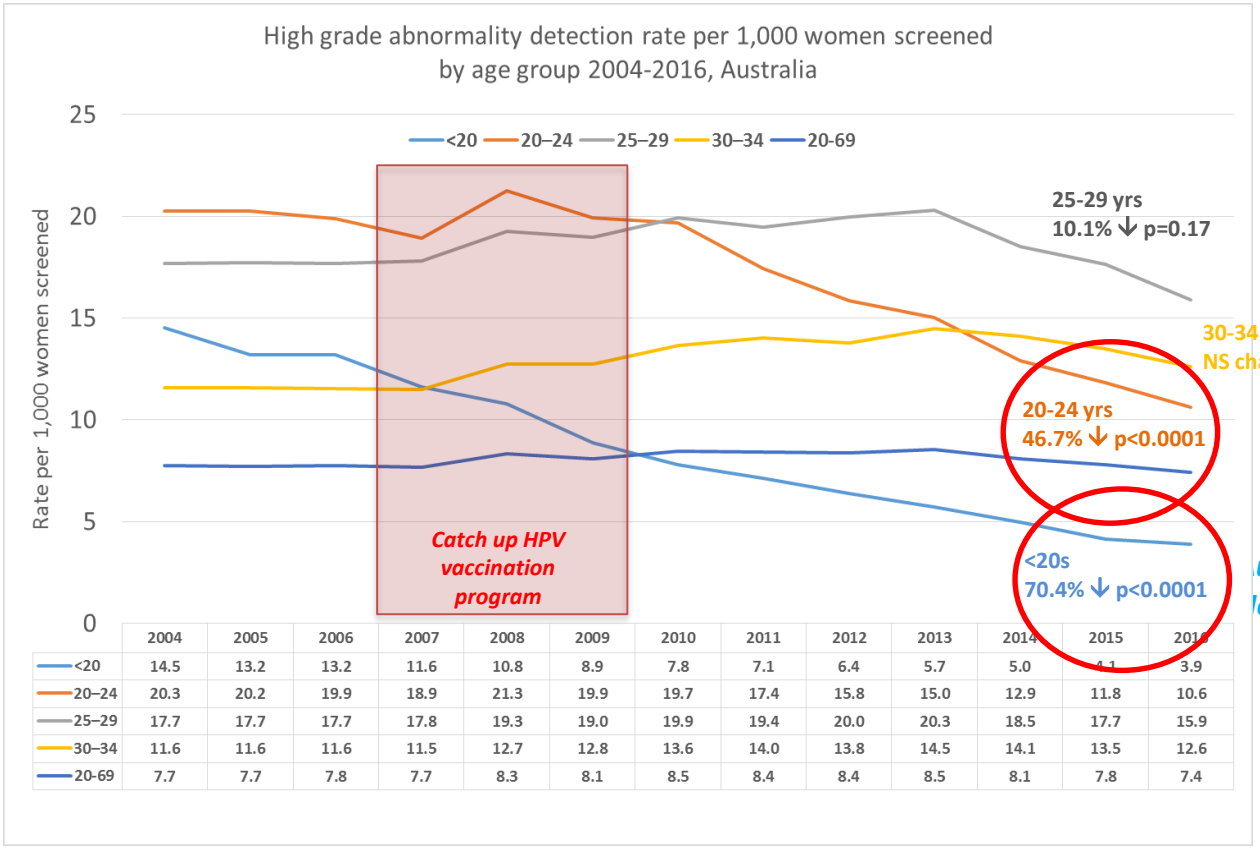
How are We Doing?

- School based programme for girls and boys
- Target 90%



% of Girls Fully Immunized through School based Programmes

Australia: High grade abnormality rates after catch-up vaccination



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
<20	14.5	13.2	13.2	11.6	10.8	8.9	7.8	7.1	6.4	5.7	5.0	4.1	3.9
20–24	20.3	20.2	19.9	18.9	21.3	19.9	19.7	17.4	15.8	15.0	12.9	11.8	10.6
25–29	17.7	17.7	17.7	17.8	19.3	19.0	19.9	19.4	20.0	20.3	18.5	17.7	15.9
30–34	11.6	11.6	11.6	11.5	12.7	12.8	13.6	14.0	13.8	14.5	14.1	13.5	12.6
20-69	7.7	7.7	7.8	7.7	8.3	8.1	8.5	8.4	8.4	8.5	8.1	7.8	7.4

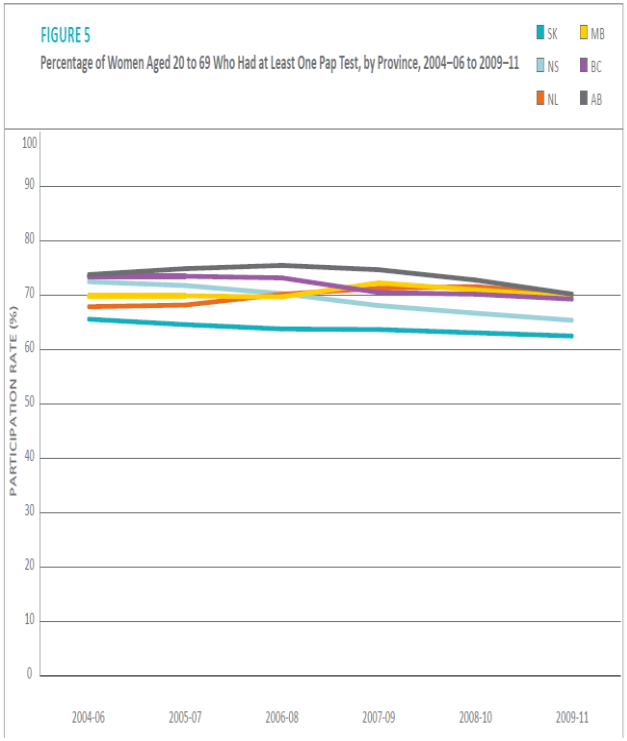
ustralian Institute of
lealth and Welfare, 2018

What will it take?

2. Screening
   - Shift to HPV from cytology
   - Reach the under-screened
   - Self testing, community mobilization
   - Target 90%

How are we Doing?

- Screening rates in Canada plateaued
- Active innovation across the country
  - Community based
  - Evidence based
  - Self testing
  - HPV



HPV Testing: European experience

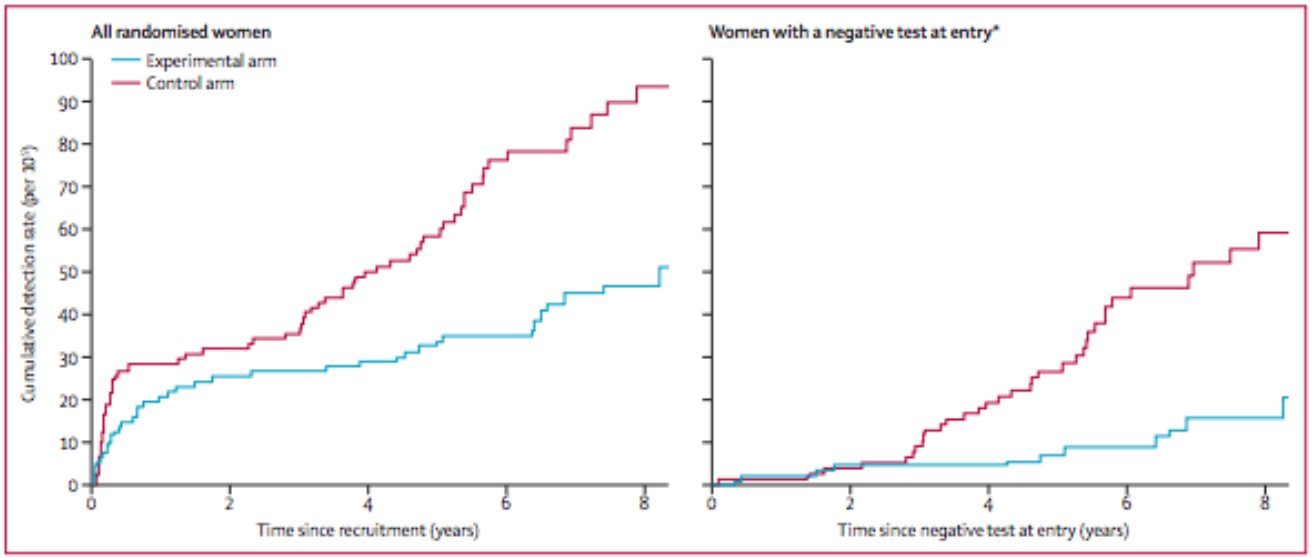
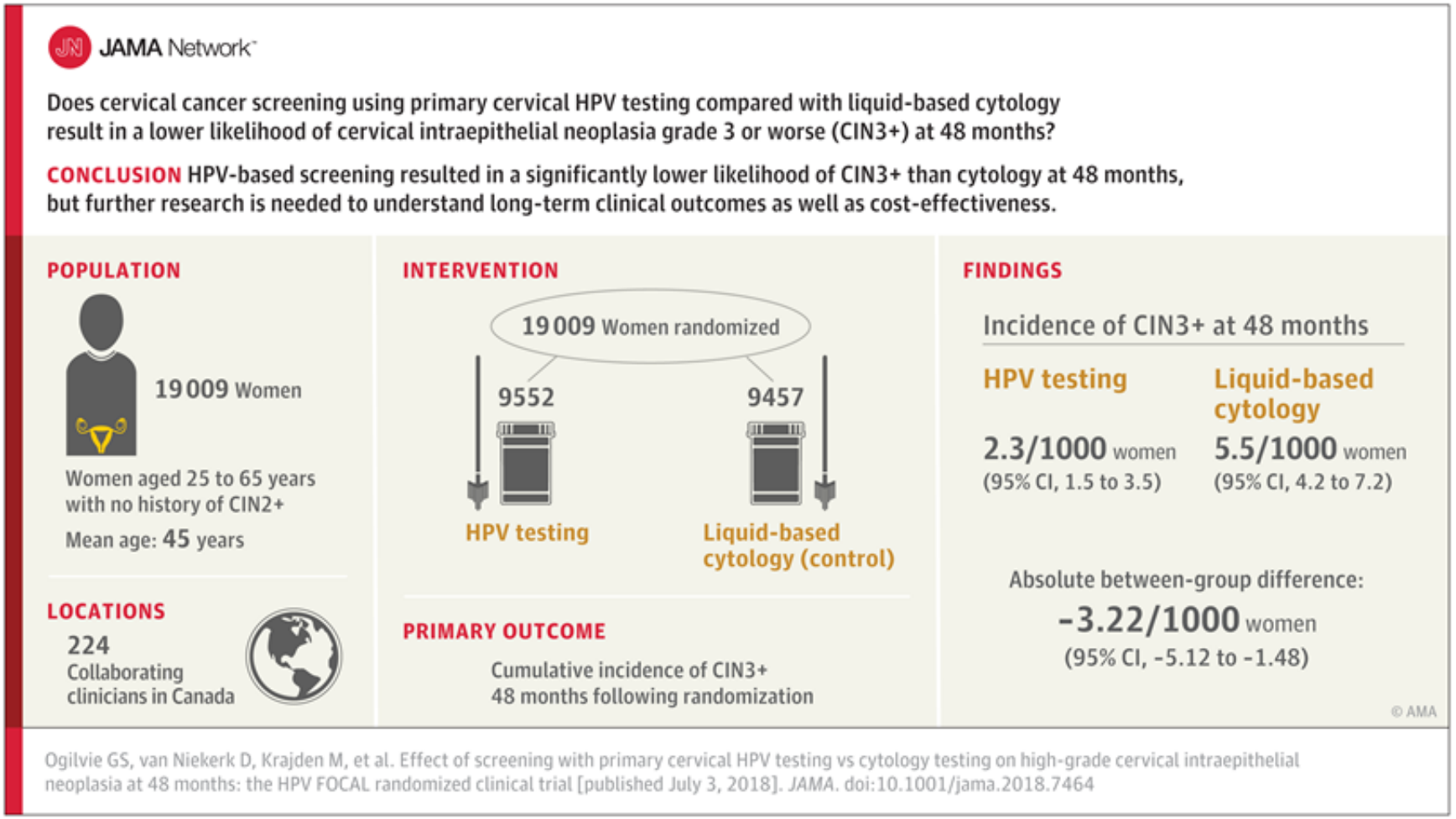


Figure 2: **Cumulative detection of invasive cervical carcinoma**
*Observations are censored 2·5 years after CIN2 or CIN3 detection, if any.

- Randomized trial in 4 European countries:
  - Conventional cytology or HPV
  - Rescreened in 3-5 years
  - HPV superior in reducing invasive cancer

www.thelancet.com Vol 383 February 8, 2014

Focal



Ogilvie GS, van Niekerk D, Krajden M, et al. Effect of screening with primary cervical HPV testing vs cytology testing on high-grade cervical intraepithelial neoplasia at 48 months: the HPV FOCAL randomized clinical trial [published July 3, 2018]. *JAMA*. doi:10.1001/jama.2018.7464

Screening challenges

Public

- No longer an annual ritual
- Confusion about guidelines
- Different cultural views
- Vulnerable peoples

MD

- Reluctant to do Pap
- Confused by changing guidelines

New Screening tools

- Self screening
- HPV testing

What will it take?

3. Treatment of pre-invasive disease
   - Follow up of abnormal results
   - Target 90%

How are we Doing?

- 26% of patients with high grade abnormalities did not have any follow-up for up to 2 years.
- Smears showing a possibility of malignancy or cancer had a loss to follow-up rate of 17% and 28%, respectively.

Kupets Gynecologic Oncology
Volume 121, Issue 3, 1 June 2011, Pages 499-504

What will it take?

4. Our will
   - This is the one chance we will get
   - Once disease slips beneath radar, will for programme will weaken
   - Double down

How are we doing?

- Canadian Partnership against Cancer
  - National steering committee
  - Gathering evidence
  - Developing plan
  - Implementation

We are Moving Ahead

Co-Create Pan-Canadian Action Plan to Eliminate Cervical Cancer

- ✓ ↑ HPV immunization
- ✓ implement HPV primary screening
- ✓ maintain access to high quality cervical cancer treatment
- ✓ include First Nations, Inuit + Métis self-determined priorities
- ✓ focus on equity-based approaches to reach underserved
- ✓ incorporate public/patient perspectives
- ✓ establish indicators/targets for Canada

CANADIAN PARTNERSHIP AGAINST CANCER PARTENARIAT CANADIEN CONTRE LE CANCER

Australian Modeling

The projected timeframe until cervical cancer elimination in Australia: a modelling study

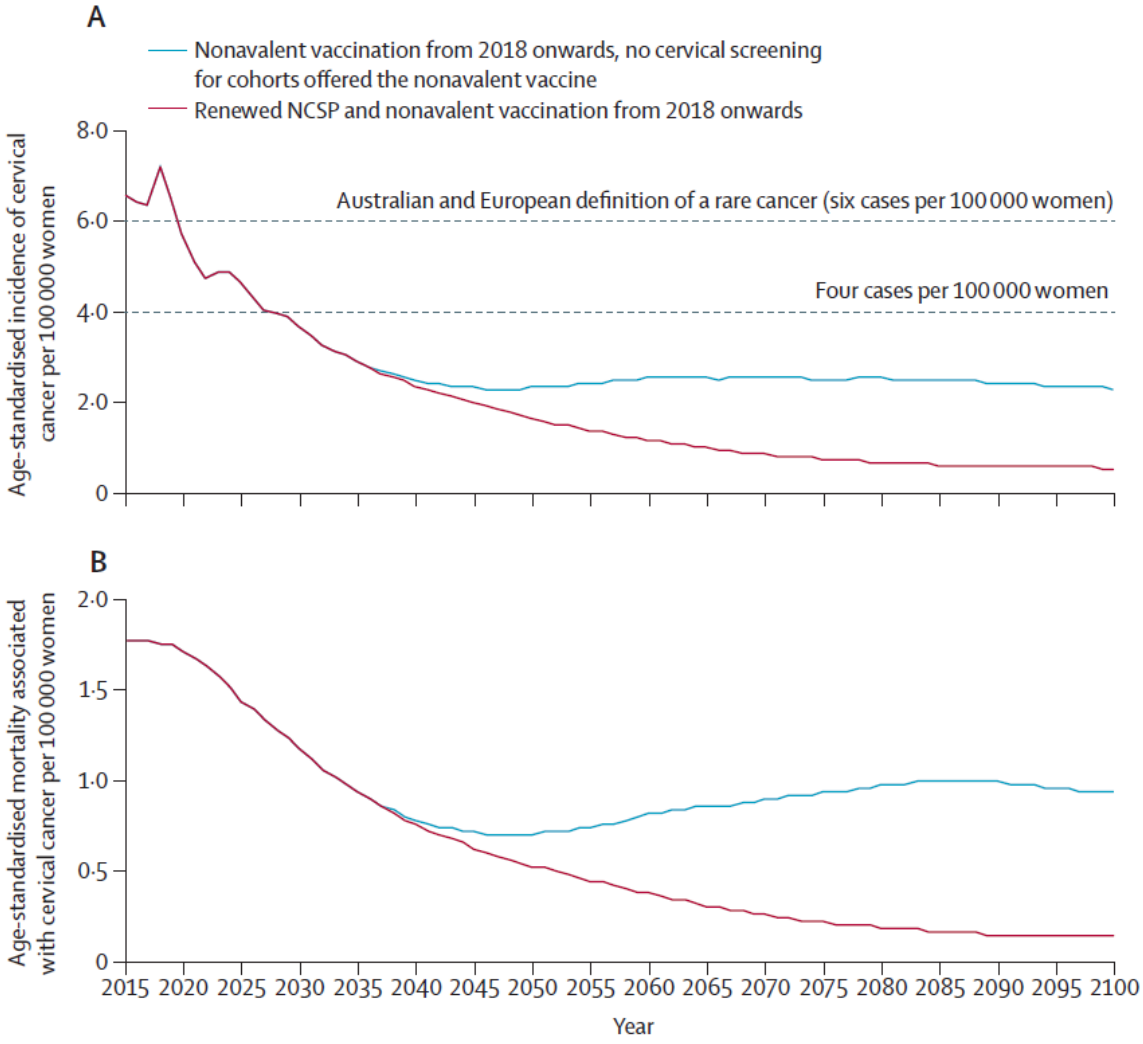
Michaela T Hall, Kate T Simms, Jie-Bin Lew, Megan A Smith, Julia ML Brotherton, Marion Saville, Ian H Frazer, Karen Canfell

Summary

Background In 2007, Australia was one of the first countries to introduce a national human papillomavirus (HPV) vaccination programme, and it has since achieved high vaccination coverage across both sexes. In December, 2017, organised cervical screening in Australia transitioned from cytology-based screening every 2 years for women aged from 18–20 years to 69 years, to primary HPV testing every 5 years for women aged 25–69 years and exit testing for women aged 70–74 years. We aimed to identify the earliest years in which the annual age-standardised incidence of cervical cancer in Australia (which is currently seven cases per 100 000 women) could decrease below two annual thresholds that could be considered to be potential elimination thresholds: a rare cancer threshold (six new cases per 100 000 women) or a lower threshold (four new cases per 100 000 women), since Australia is likely to be one of the first countries to reach these benchmarks.

Findings

- “We estimate that, in Australia, the incidence of cervical cancer will decrease to fewer than four new cases per 100 000 women by 2028
- Cervical cancer mortality is estimated to decrease to less than one death per 100 000 women by 2034

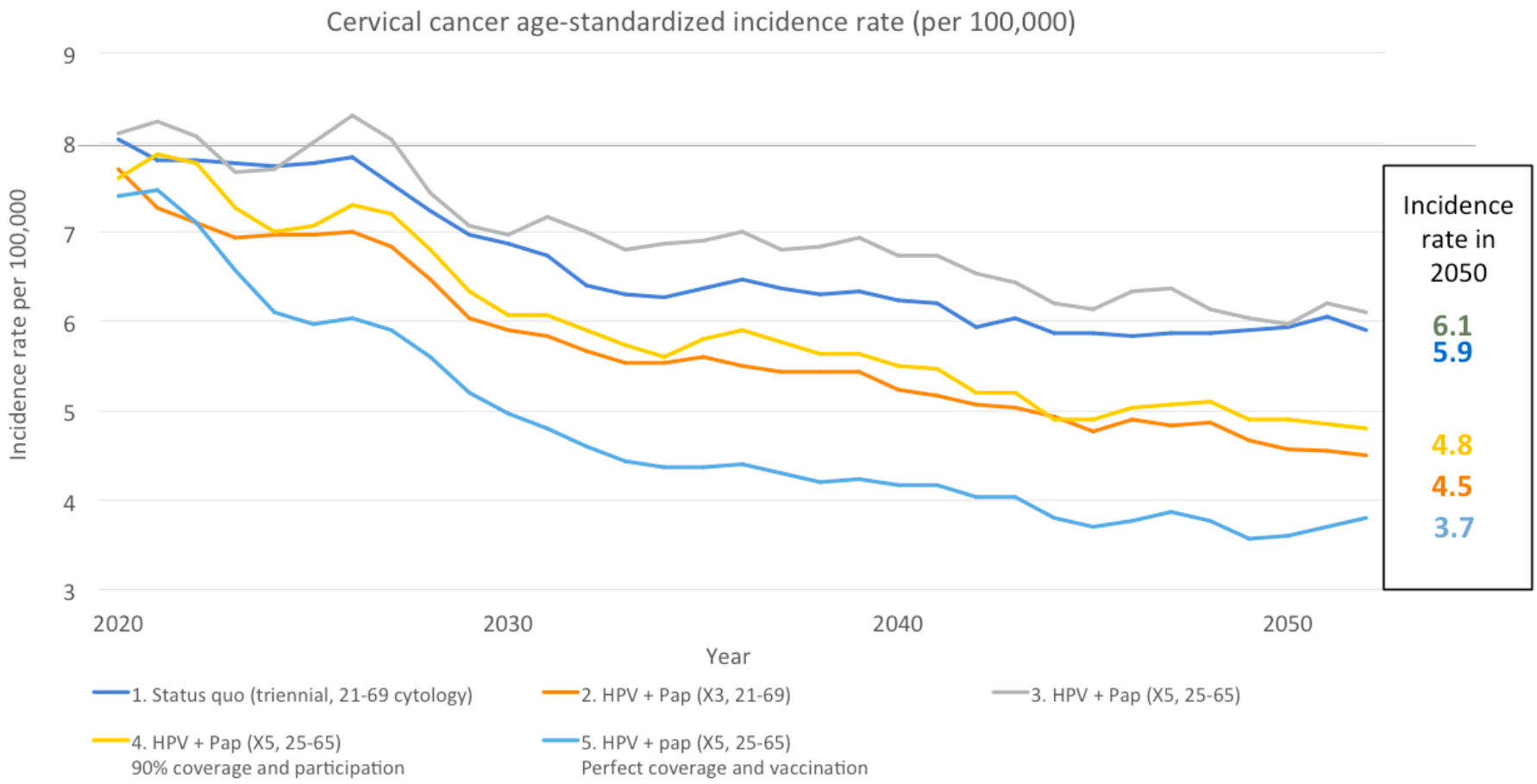

A
Nonavalent vaccination from 2018 onwards, no cervical screening for cohorts offered the nonavalent vaccine
Renewed NCSP and nonavalent vaccination from 2018 onwards
Age-standardised incidence of cervical cancer per 100 000 women
8·0
6·0
4·0
2·0
0
Australian and European definition of a rare cancer (six cases per 100 000 women)
Four cases per 100 000 women
B
Age-standardised mortality associated with cervical cancer per 100 000 women
2·0
1·5
1·0
0·5
0
2015 2020 2025 2030 2035 2040 2045 2050 2055 2060 2065 2070 2075 2080 2085 2090 2095 2100
Year

Canadian modelling

- Oncosim
- CPAC, Dr. Cathy Popadiuk

Screening and vaccination scenarios

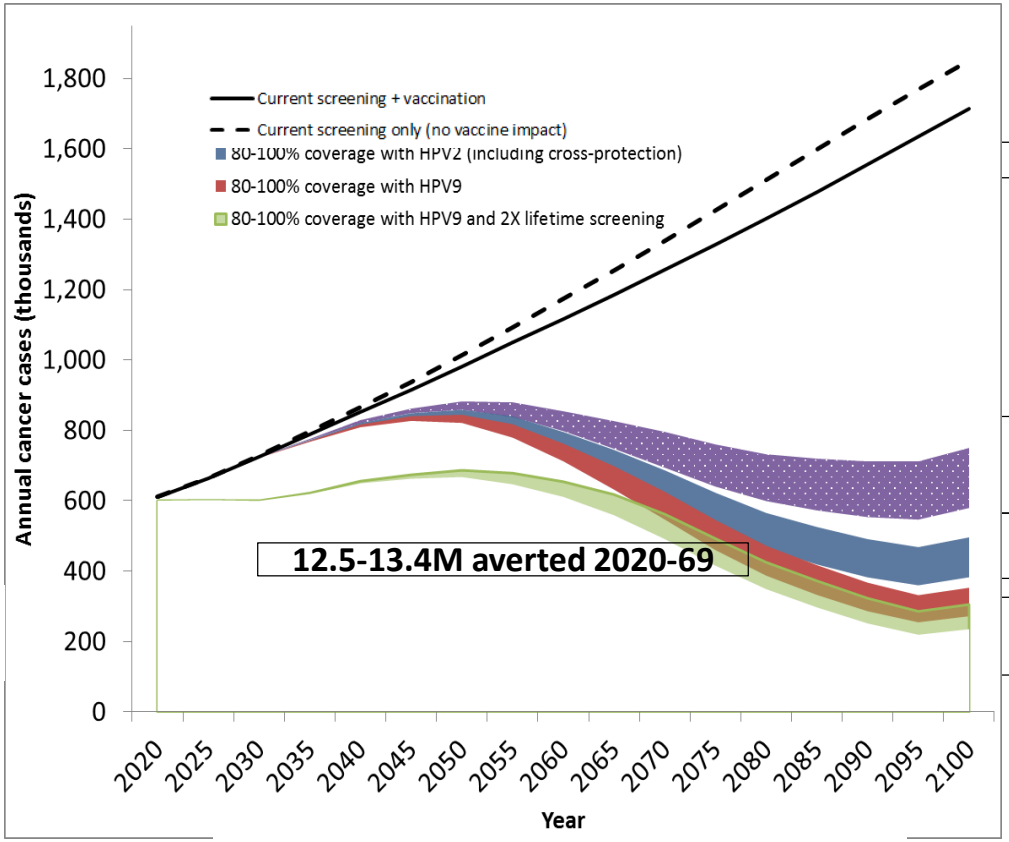
Scenario ID	1	2	3	4	5
Description	Status quo	Status quo with HPV testing	Recommended HPV testing	HPV testing with short-term catch-up & better coverage	HPV testing with long-term catch-up & perfect coverage
Screening Method	Cytology	HPV + Pap triage	HPV + Pap triage	HPV + Pap triage	HPV + Pap triage
Age range	21 to 69	21 to 69	25 to 65	25 to 65	25 to 65
Frequency	Every 3 years	Every 3 years	Every 5 years	Every 5 years	Every 5 years
Screening participation	90%	90%	90%	95%	100%
Rescreen rate	80%	80%	80%	95%	100%
Vaccination coverage	70%	70%	70%	90%	100%
Catch up program	N/A	N/A	N/A	Boys and girls (13-26) 2019-2021	Boys and girls (over 13) 2019-onwards


Cervical cancer age-standardized incidence rate (per 100,000)
Incidence rate per 100,000
9
8
7
6
5
4
3
2020
2030
2040
2050
Year
Incidence rate in 2050
6.1
5.9
4.8
4.5
3.7
1. Status quo (triennial, 21-69 cytology)
2. HPV + Pap (X3, 21-69)
3. HPV + Pap (X5, 25-65)
4. HPV + Pap (X5, 25-65)
90% coverage and participation
5. HPV + pap (X5, 25-65)
Perfect coverage and vaccination

What are our challenges?

1. Thinking about cancer control instead of infectious disease elimination
2. Over-simplifying vaccine hesitancy
3. Stigma and social inequalities in burden of disease
4. Elimination as a “public health priority”
5. Thinking locally: viruses don’t stop at the border

Timeline to global elimination



1M averted 2020-29

4.9-6.0M averted 2020-69

6.1-7.1M averted 2020-69

6.7-7.7M averted 2020-69

International Agency for Research on Cancer

World Health Organization

Simms KT et al., Lancet Oncology 2019

What are the risks?

- The disease will be a burden on the most vulnerable
- The global burden will increase as we reduce childhood mortality and maternal mortality
- We will miss the opportunity for elimination

Finally: Our Commitment

1. Elimination
2. No one left behind