# Advances in cervical cancer prevention

Dr Margaret Sage
NCSP Clinical Lead, Pathology

Time to screen
National Cervical Screening Programme

New Zealand Government

# Major advances are occurring in cervical cancer prevention: four topics

1. **Reducing health inequities** between different population groups in New Zealand
2. **HPV immunisation (primary prevention):** prevents HPV infection so less abnormal cytology and histology
3. **Primary screening with HPV testing (secondary prevention):** more sensitive than cytology so more detection
4. **Self-testing (self-collection) for HPV tests:** increases coverage i.e. more people screened so more detection

# Topic 1: Inequities in cervical screening

## New Zealand has a high quality cervical screening programme…

- In 2012 our cervical cancer incidence and mortality rates were the third lowest in the world (after Finland and Switzerland)
  - Since: our coverage has dropped, other countries have moved ahead with HPV primary screening and have better HPV immunisation rates

## …BUT we have significant ethnic disparities in cervical cancer rates

- The NCSP has been trying hard to close the gap between Maori and European/Pakeha cervical cancer rates for years, with limited success
- major initiatives now being introduced to reduce inequalities

Treaty of Waitangi (Te Tiriti o Waitangi) signed 1840

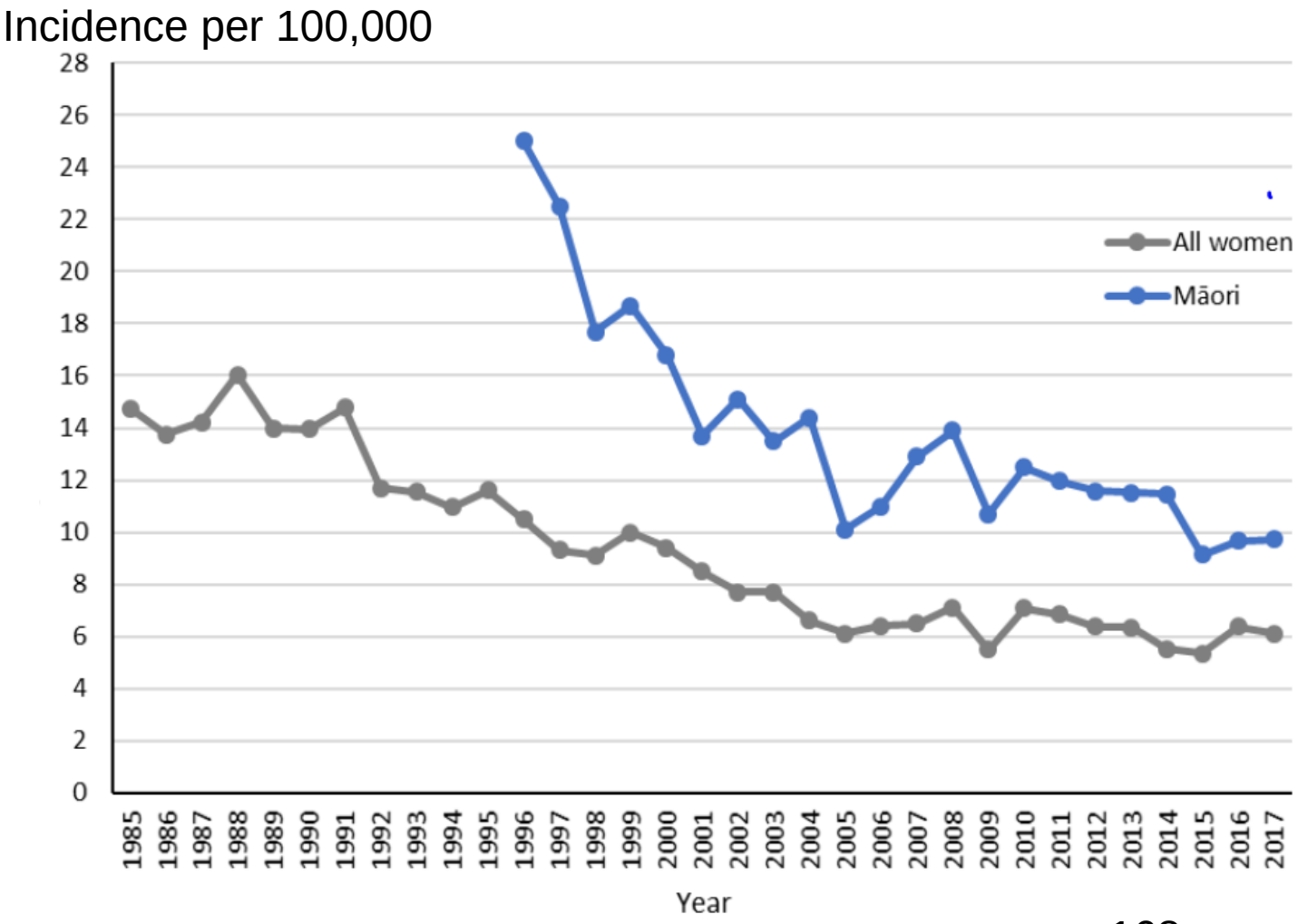
**2021 Stats NZ Estimates**

***Total NZ Population***

**5,122,600**

| | |
|---|---|
| European/Pakeha | 69.4% |
| Maori | 17.1% |
| Asian | 17.1% |
| Pacific | 8.6% |

# NCSP Annual Report 2017
# Age-standardised (WHO) cervical cancer incidence rates 1985-2017



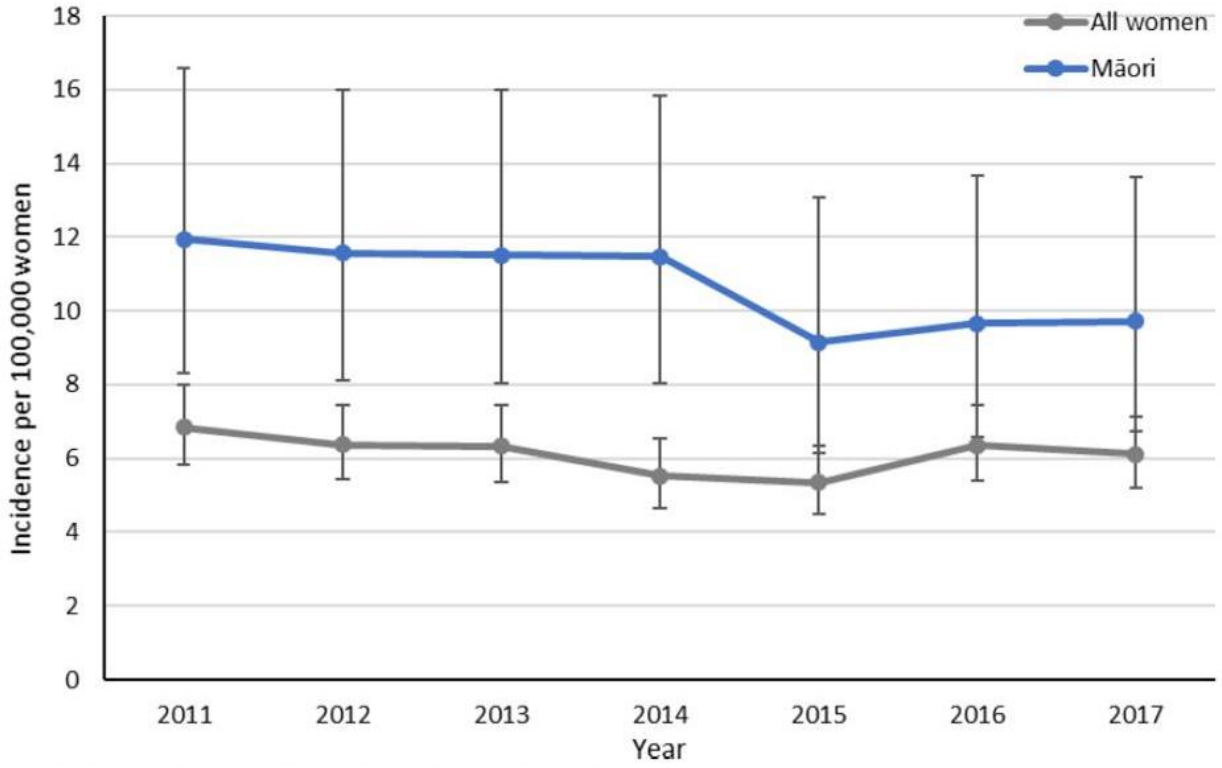

9.7 Maori

6.1 All women

(5.7 Euro/ Pakeha)

168 new cases in 2017

# Is the gap closing?
## Cervical Cancer incidence 2011-2017

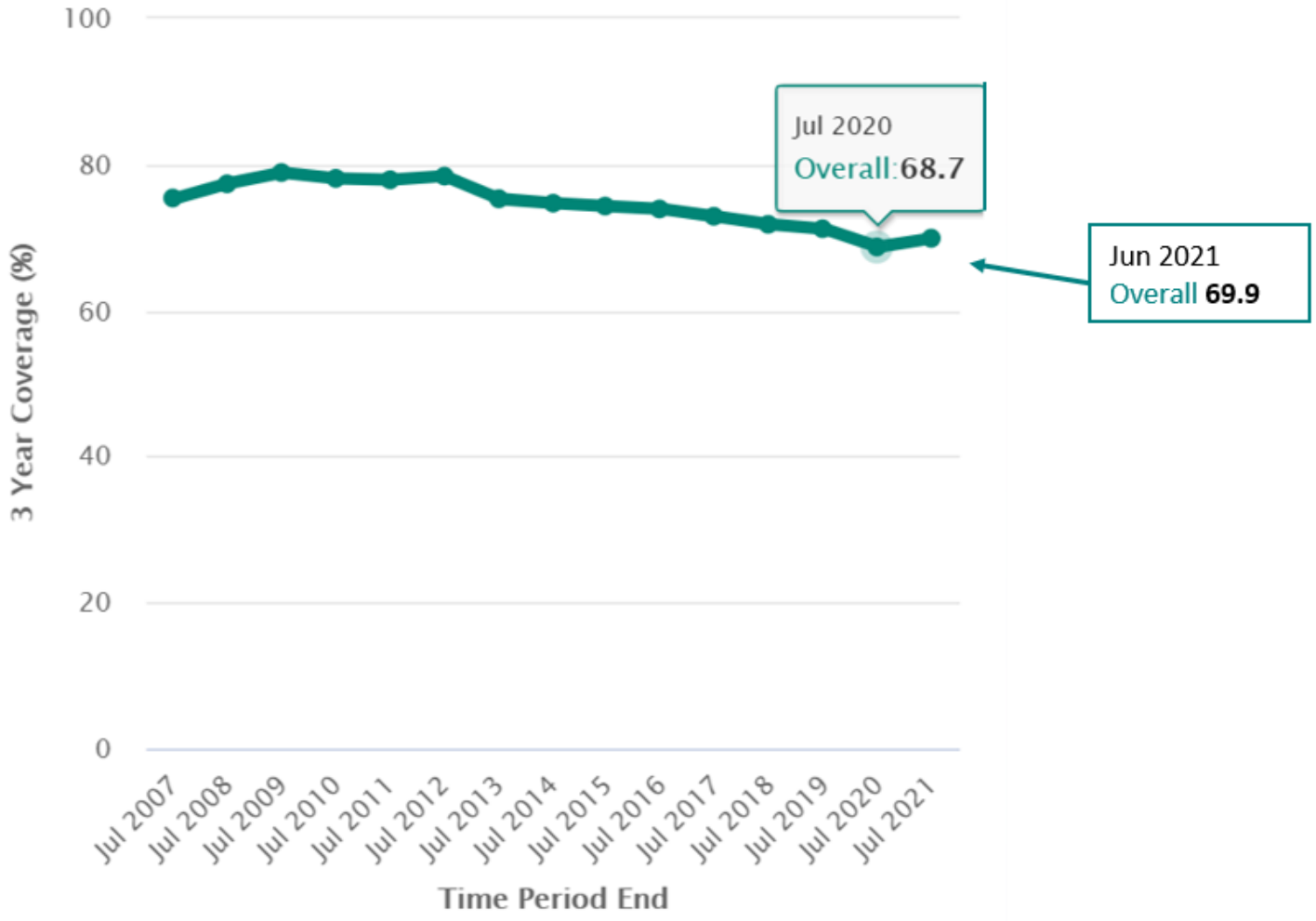



Vertical bars represent 95 percent confidence intervals.

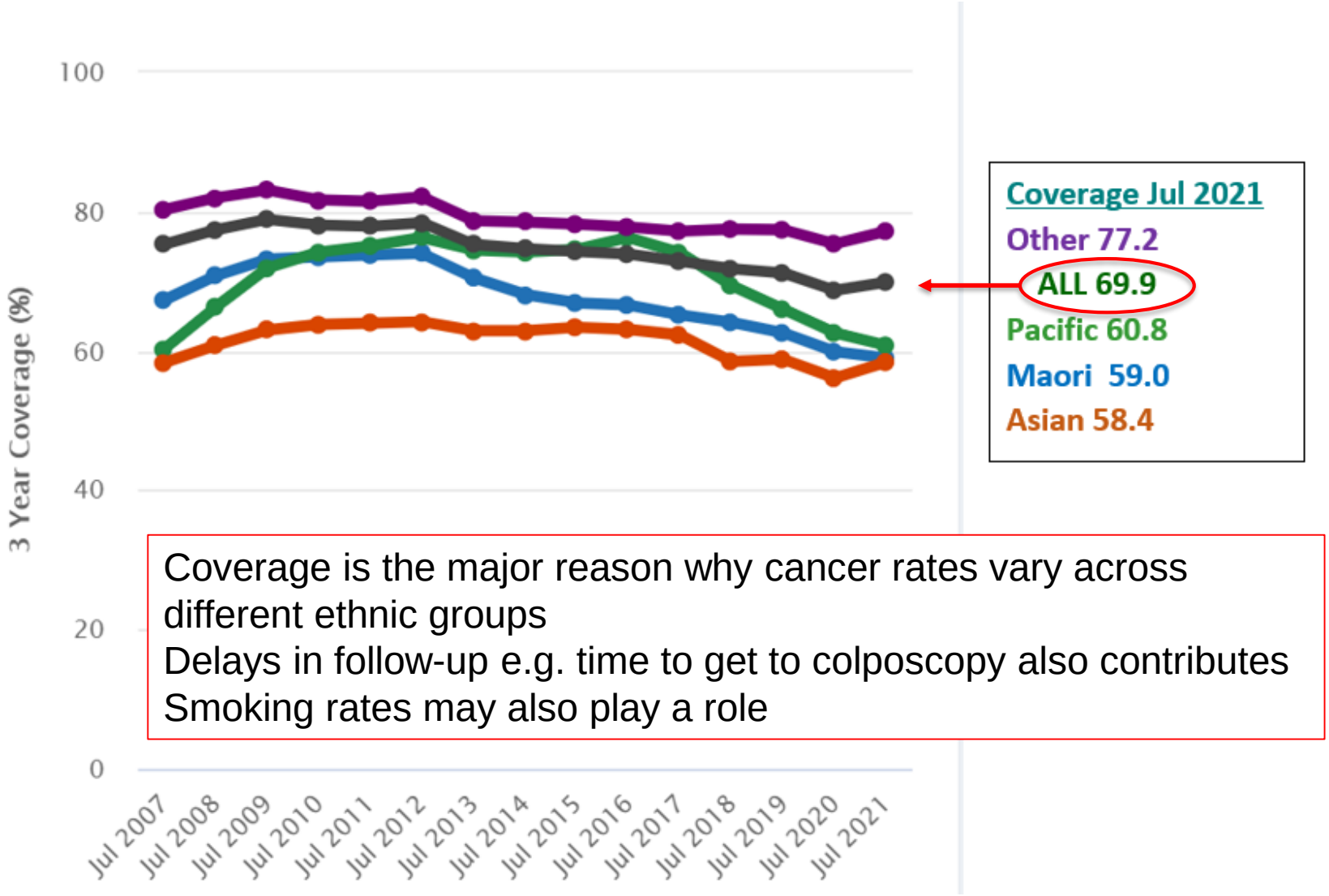
Rates Maori vs All women: 2011: 12.0/6.8 = 1.7 x higher for Maori
2017: 9.7/6.1 = 1.6 x higher for Maori

Rates Maori vs Euro/Pakeha women: 2011: 12.0/6.2 = 1.8 x higher for Maori
2017: 9.7/5.7 = 1.7 x higher for Maori

# 3-year screening coverage, 25-69 years over 15 years, to July 2021



# 3-year screening coverage, 25-69 years over 15 years, to July 2021, by ethnicity

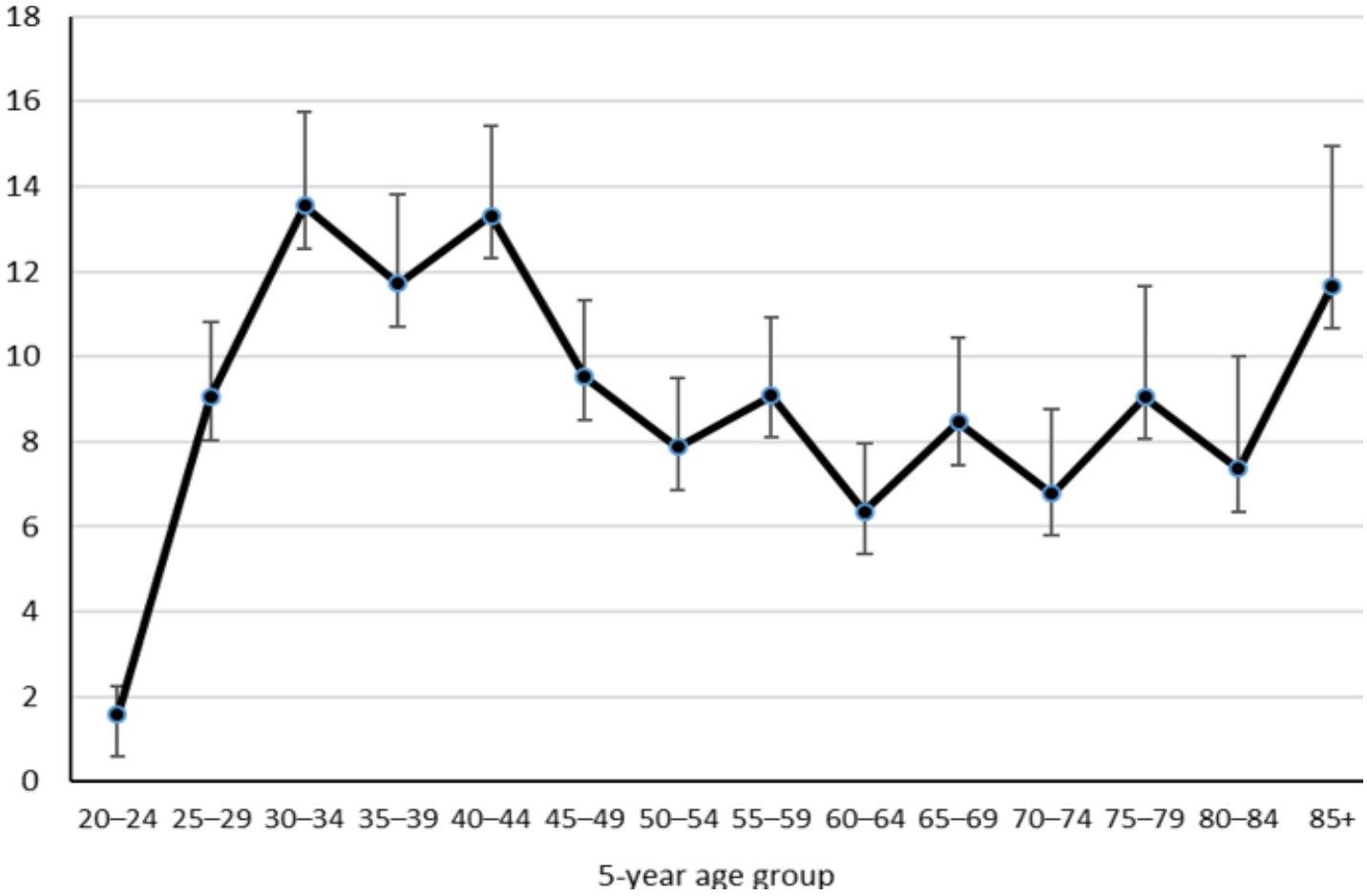



Coverage is the major reason why cancer rates vary across different ethnic groups
Delays in follow-up e.g. time to get to colposcopy also contributes
Smoking rates may also play a role

# NCSP Annual Report 2017

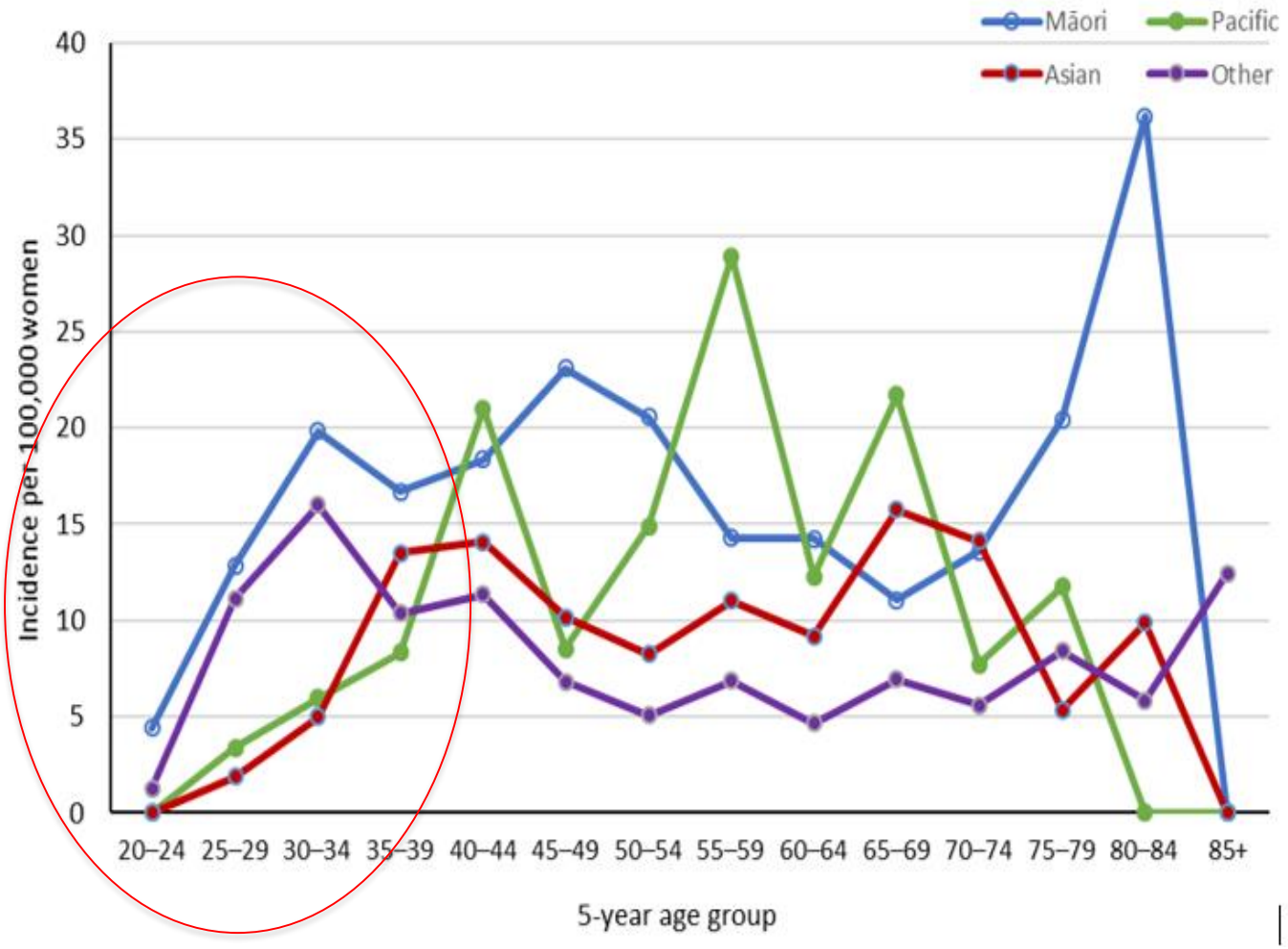
## Age-standardised (WHO) cervical cancer incidence rates in 5–year periods by age: 2013-17

Incidence per 100,000 women



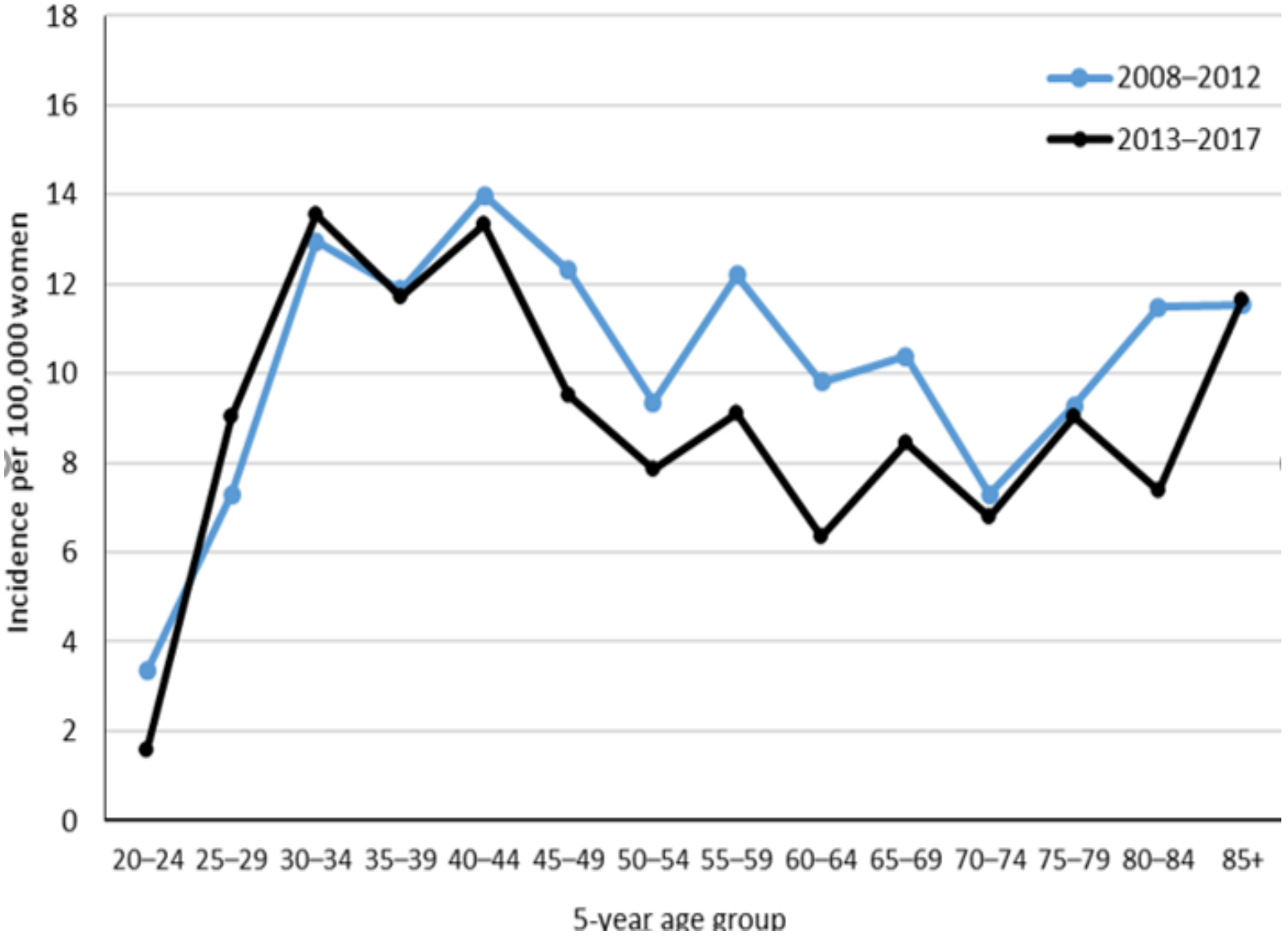
# NCSP Annual Report 2017

## Cervical Cancer Incidence Rates in 5 year periods, by age and ethnicity

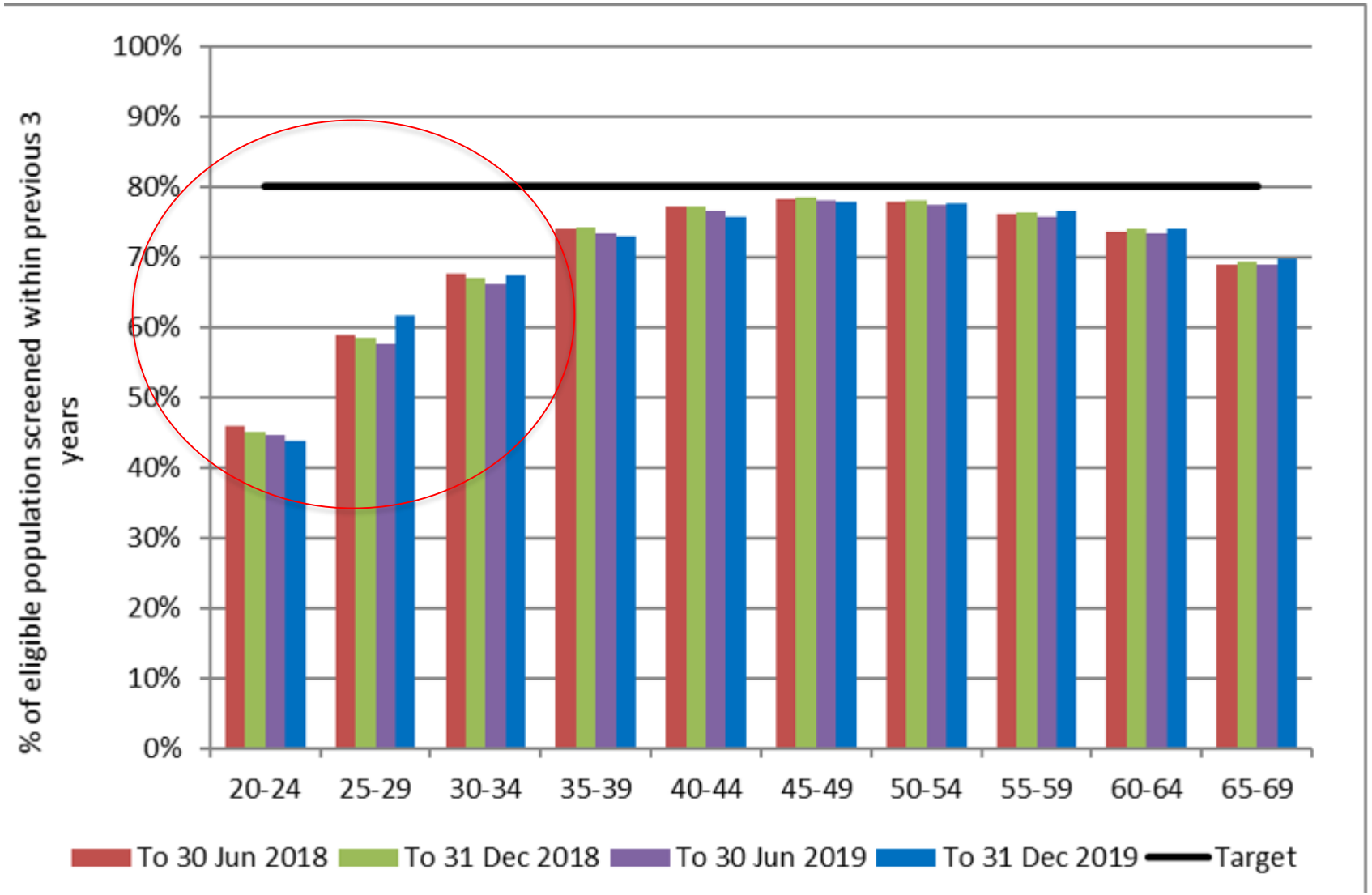


# NCSP Annual Reports 2012 and 2017

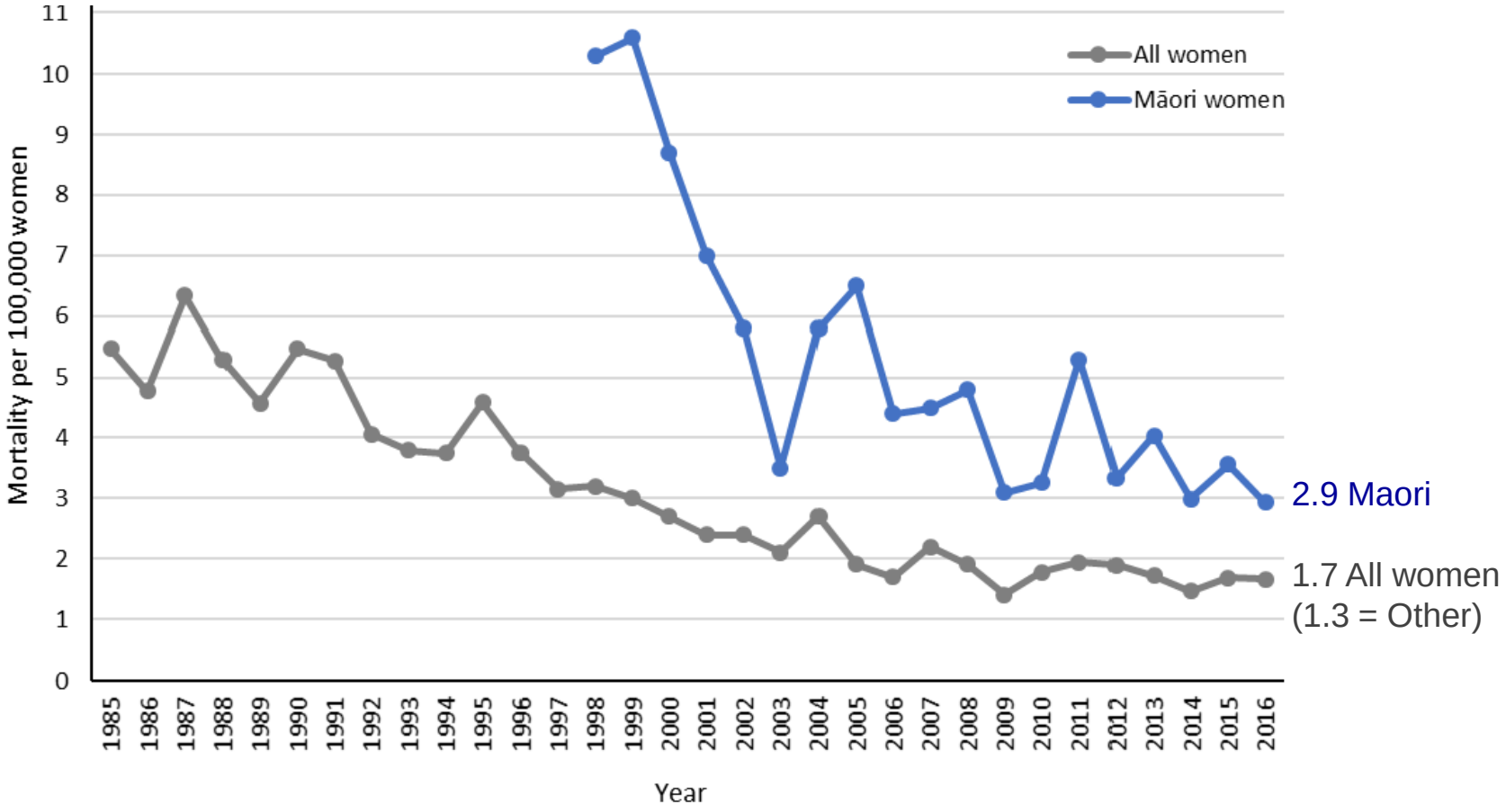
## Cervical Cancer Incidence Rates in 5 year periods, by age



# Trends in 3-year coverage by age (women screened in the previous three years, as a proportion of the hysterectomy-adjusted population)



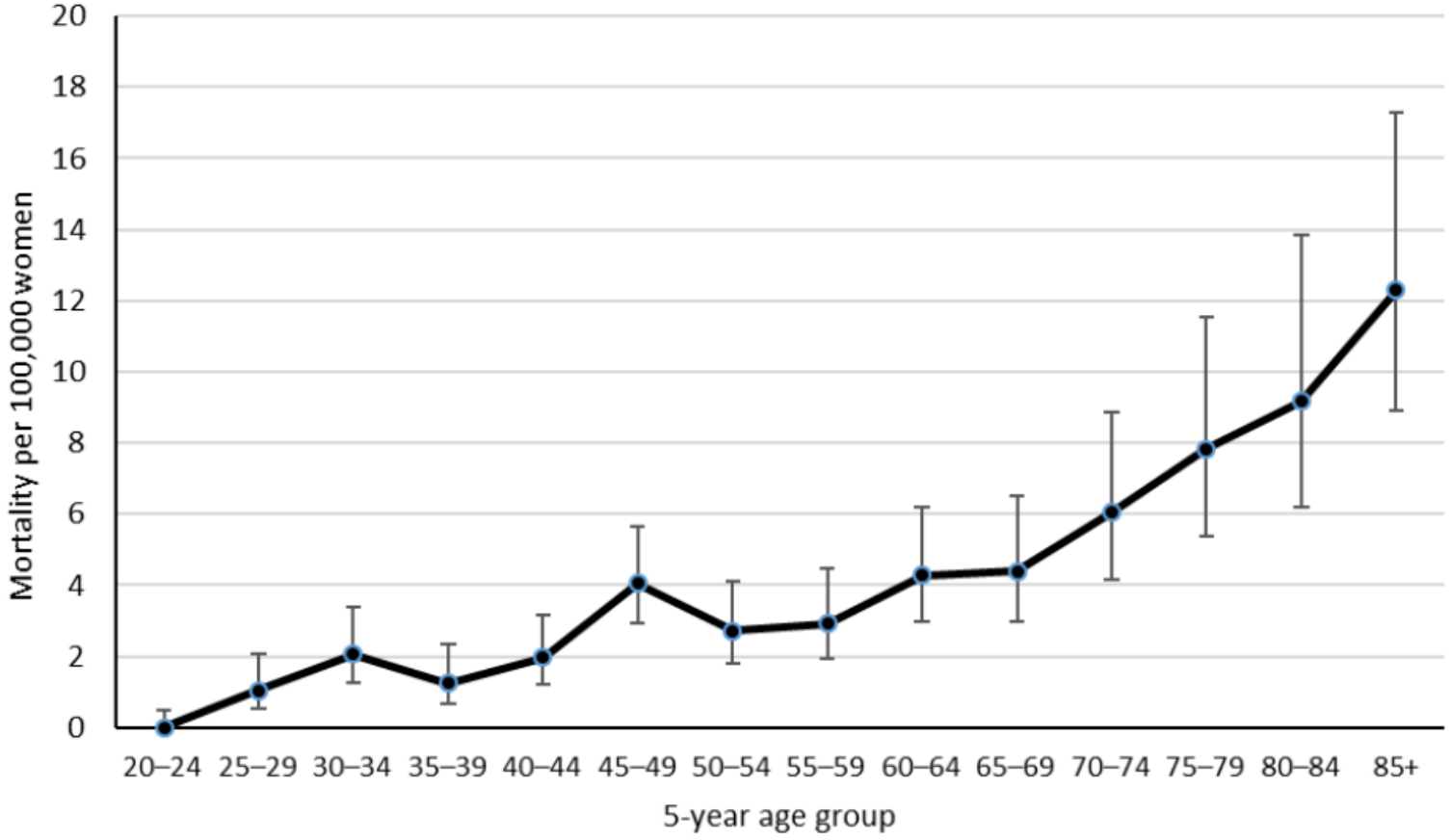
# NCSP Annual Report 2017
# Age-standardised (WHO) cervical cancer mortality rates




Maori death rate is 1.7 times All women rate, and 2.2 times Euro/Pak women

# NCSP Annual Report 2017

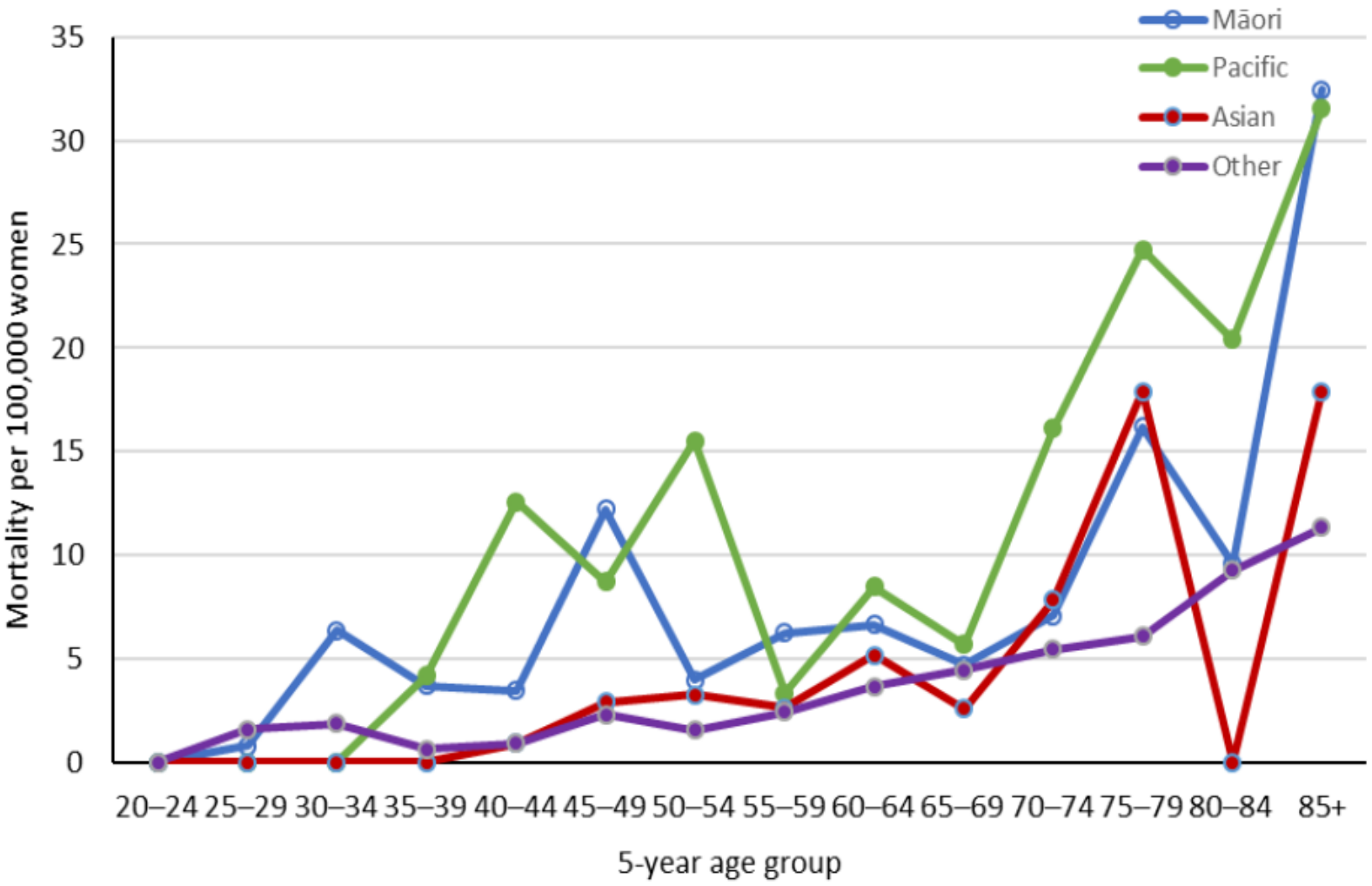
## Five-year average cervical cancer mortality rates (2011-2015) by age




Vertical bars represent 95 percent confidence intervals. See also Table 5.

# NCSP Annual Report

## Five-year average cervical cancer mortality rates, 2012-16, by age and ethnicity



# Topic 2. HPV Immunisation in NZ


HPV immunisation programme using Gardasil-4 commenced in 2008, was free for women up to 20 years of age

The school–based programme for girls began in 2011 and was much more successful in achieving coverage.

Since 1 Jan 2017:

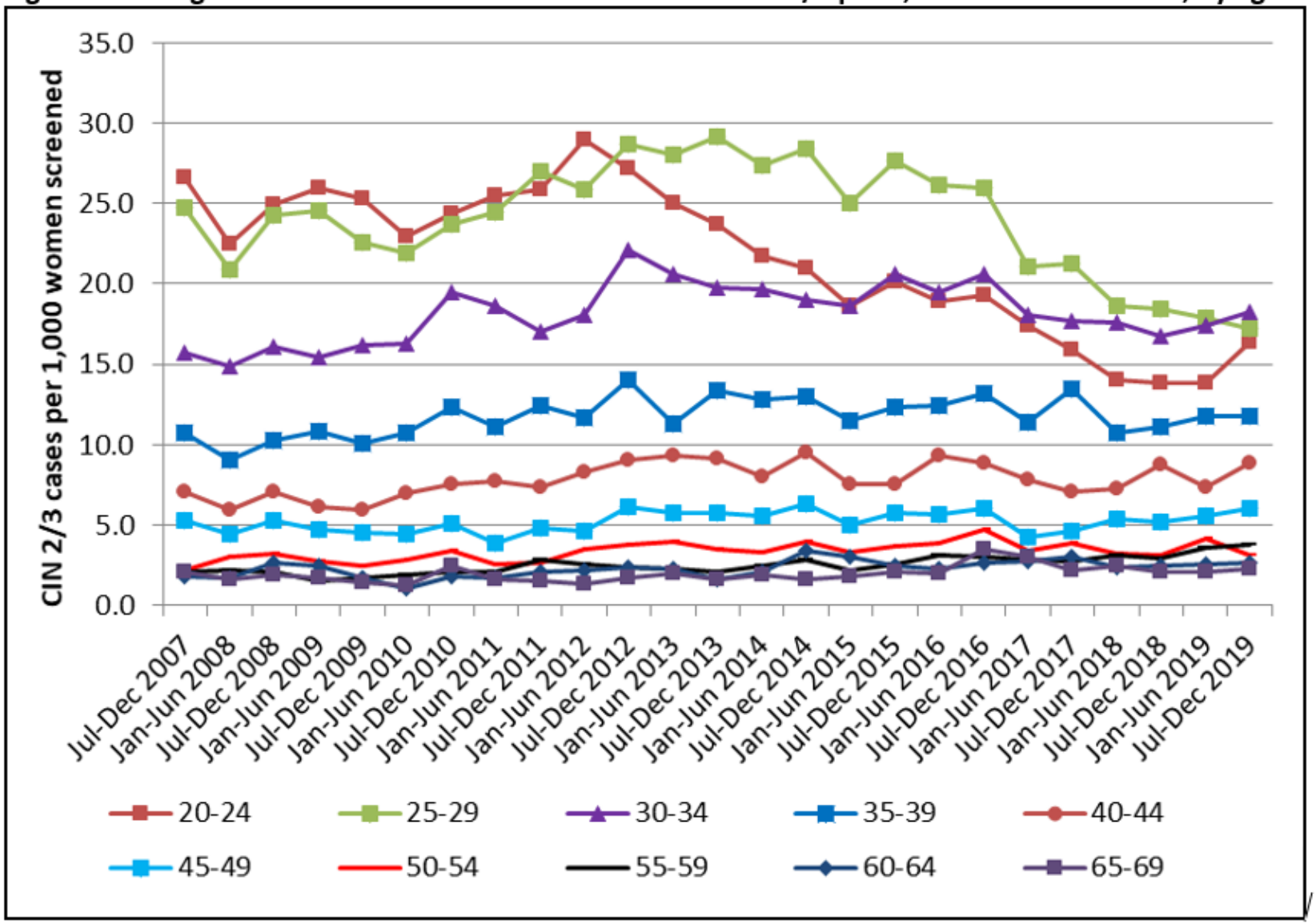
Gardasil-9 is funded for both boys and girls aged 9-26 years (inclusive) with two-doses @9-14 years and three doses@15+ years of age

- Vaccination sometimes used after treatment of a high-grade lesion because it can still protect against other HPV types

In 2017, approximately 70% of both boys and girls aged 10-11 years were immunised against HPV

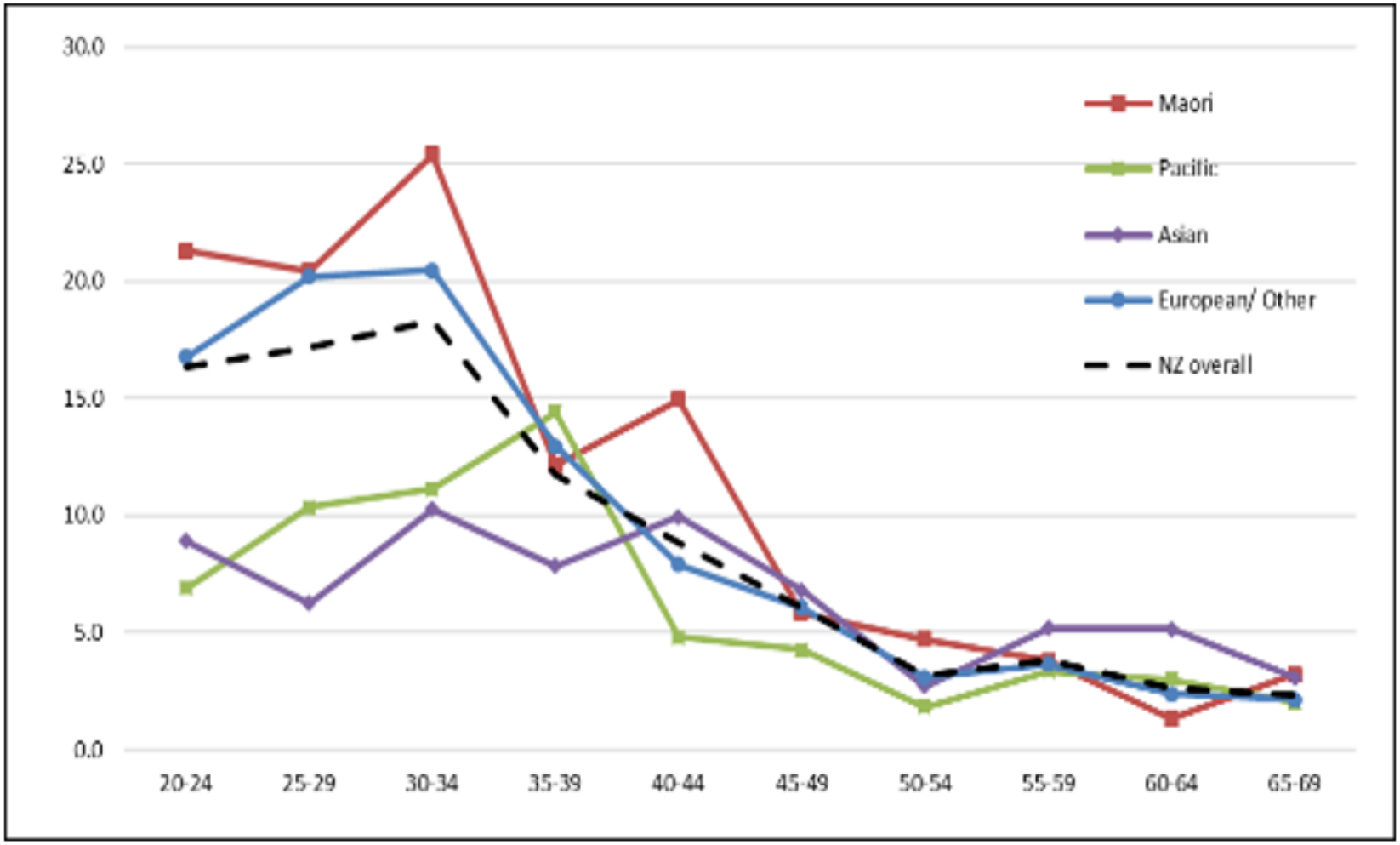
# Effect of immunisation to date

**Figure 65 - Longer term trends in the rate of women with CIN 2/3 per 1,000 women screened, by age**



# High rates of CIN2/3 occur in women <35 years

Rate of women with CIN2/3 per 1,000 women screened, by age and ethnicity for July-Dec 2019



Type distribution of HPV among adult women diagnosed with invasive cervical cancer (stage 1b or higher) in New Zealand

Peter Sykes, Kusuma Gopala, Ai Ling Tan, Diane Kenwright, Simone Petrich, Arico Molijn, and Jing Chen

*BMC Infectious Diseases* 2014,14:374

HPV genotyping was performed on cervical tissue for 227 cases of cervical cancer diagnosed 2004 - 2010

HPV was detected in 201 cases (88.5%) with multiple infections present in 11 cases (5.5%).

Red HPV types: Gardasil-9 (191/212 infections)

| HPV type | No. of infections |
|---|---|
| HPV-16 | 116 |
| HPV-18 | 47 |
| HPV-31 | 9 |
| HPV-45 | 7 |
| HPV-52 | 7 |
| HPV-59 | 5 |
| HPV-33 | 4 |
| HPV-35 | 3 |
| HPV-39 | 3 |
| HPV-51 | 2 |
| HPV-56 | 3 |
| HPV-66 | 1 |
| HPV-68 | 3 |
| Un-identified | 2 |
| Low-risk HPV-11, 70 | 2 (1) |

# Topic 3: Primary screening with HPV tests

## NCSP in NZ: what we do now

Cytology-based screening from 25-69 years of age with a 3-yearly screening interval

- hrHPV testing is used as a second test for

  1. Triage of low-grade cytology for women 30+years with no cyto/histo abnormality in the last 5 years
  2. Test of cure after treatment of high-grade squamous lesions
  3. Specialist-ordered testing for managing women with discordant histo/cyto/colposcopy results

# Changing cervical screening in NZ

March 2016: Minister of Health announced that the NCSP will move to HPV primary screening with partial genotyping and cytology triage, with screening commencing at 25 years of age

June 2018

1. Implementation of HPV primary screening was delayed until 2021 (later delayed again to 2023)
2. The recommenced age to commence screening would still rise to 25 years in 2019 (which it did)

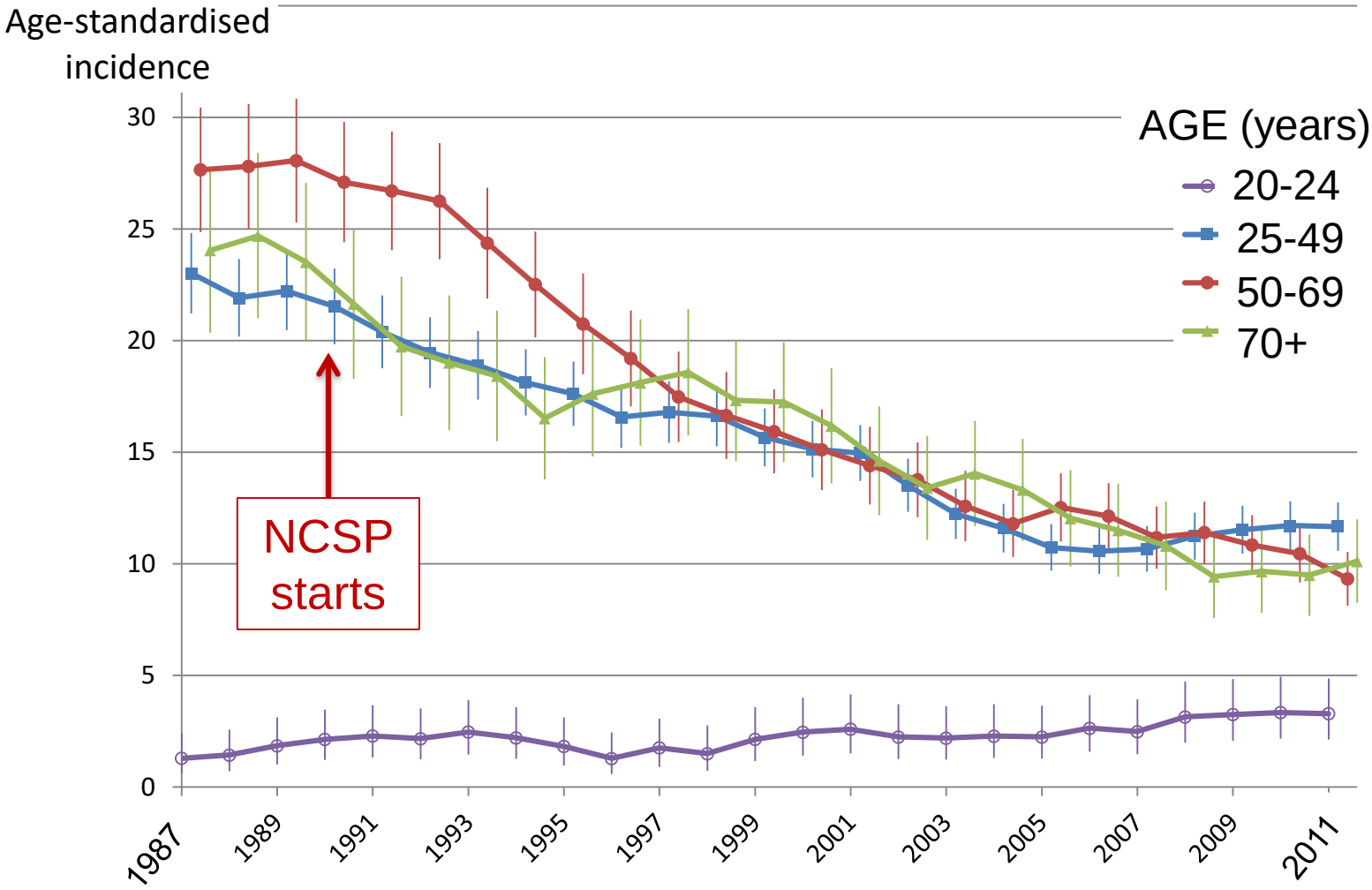
# The NCSP raised the recommended age to commence cervical screening to 25 years of age in November 2019

- This remained cytology-based screening
- Women commencing screening continue to have two screens 12 months apart before moving to regular three-yearly screening

Recommendations are:

1. Women who have *not commenced screening*: Start at 25
2. Women who have *already been screened and have had an abnormality*: Continue with current management pathway
3. Women who have *commenced screening and have normal results*: Continue with the current screening pathway

# Five-year average cervical cancer incidence in New Zealand, by age (age-standardised, per 100,000)



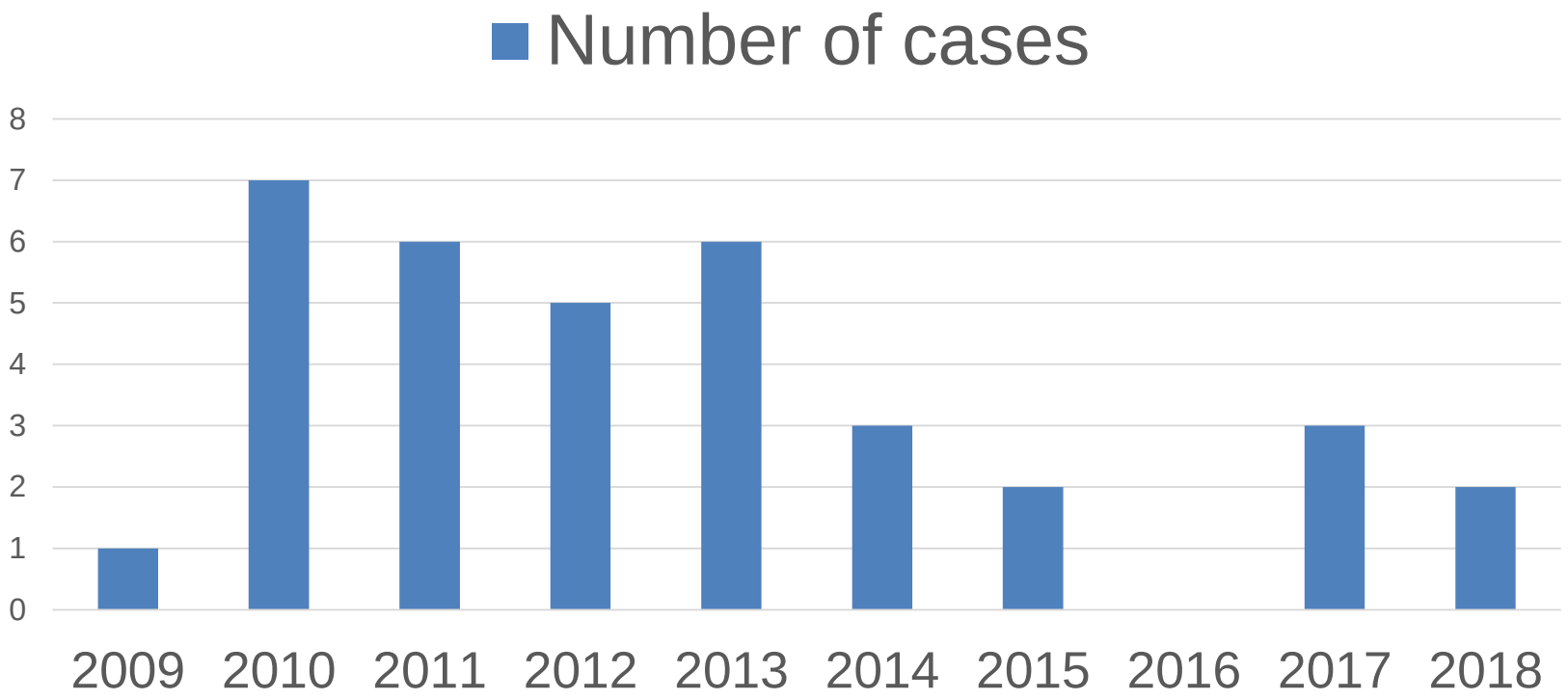

***Cancer Council of NSW***

*A/Prof Karen Canfell, Dr Megan Smith*

# Invasive cervical cancers under 25 years: 2009-18 New Zealand Cancer Registry data

2009-2013: 25 cases

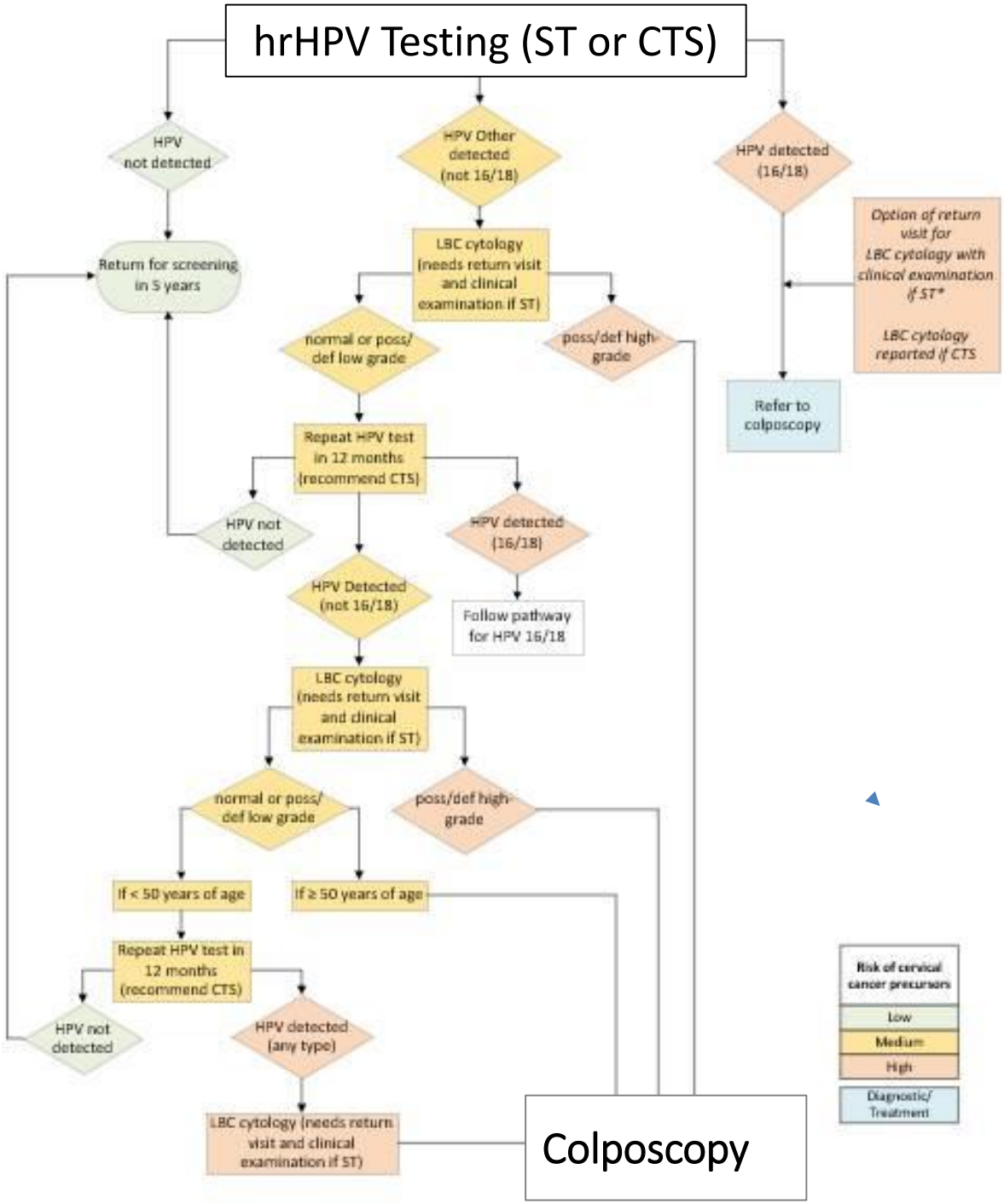
2014-2018: 9 cases (excluding one sarcoma in 2015)



# NCSP: what we will do from mid-2023

HPV-based screening from 25-69 years of age with a 5-yearly screening interval

- Cytology will be used as a second test for those who are HPV positive


hrHPV Testing (ST or CTS)
HPV not detected
HPV Other detected (not 16/18)
HPV detected (16/18)
Option of return visit for LBC cytology with clinical examination if ST*
LBC cytology reported if CTS
Return for screening in 5 years
LBC cytology (needs return visit and clinical examination if ST)
normal or poss/ def low grade
poss/def high grade
Refer to colposcopy
Repeat HPV test in 12 months (recommend CTS)
HPV not detected
HPV detected (16/18)
HPV Detected (not 16/18)
Follow pathway for HPV 16/18
LBC cytology (needs return visit and clinical examination if ST)
normal or poss/ def low grade
poss/def high grade
If < 50 years of age
If ≥ 50 years of age
Repeat HPV test in 12 months (recommend CTS)
HPV not detected
HPV detected (any type)
LBC cytology (needs return visit and clinical examination if ST)
Colposcopy
Risk of cervical cancer precursors
Low
Medium
High
Diagnostic/ Treatment

# Predicted reductions in cervical cancer rates by using HPV testing for primary screening (vaccinated-unvaccinated scenarios)

Incidence reduction: 11.7 – 15.7%

Mortality reduction: 11.9 – 16.5%

If 170 new cases annually, HPV screening strategy prevents 20 - 27 cases

If 60 deaths annually, HPV screening strategy prevents 7 – 10 deaths

These predictions to not include the impact of self-testing to increase coverage so the gains are likely to be quite a bit higher than this

Type distribution of HPV among adult women diagnosed with invasive cervical cancer (stage 1b or higher) in New Zealand

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Red HPV types: Gardasil-9 (191/212 infections)

Green types: HPV Testing covers the red HPV types plus the green HPV types

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# 4. Self-Testing (= self-sampling or self-collection)

Self-testing can assist women who are reluctant or unable to be screened currently, to have a cervical screening test. This could result in a significant reduction in cervical cancer rates.

Trials in New Zealand have shown significant acceptability and impact on improving coverage rates particularly for Maori women and underscreened women

Robust evidence has established that HPV testing on a self-collected sample is as accurate as a clinician-taken sample as long PCR DNA-based HPV test technology is used. All NZ HPV test technologies comply with this

- Sampling will still be based in primary health care, with a variety of outreach initiatives to improve coverage.

# The future is bright for cervical cancer prevention