

# **Cervical Screening in New Zealand**

A brief statistical review  
of the first decade



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## Executive Summary

This review summarises key statistics relating to the NCSP from its inception in 1991 to the early 2000s – approximately the first decade.

These statistics show that over the ‘first decade’ of the Programme:

- the incidence of invasive cervical cancer has decreased
- deaths from cervical cancer have decreased
- the rate of detection of cervical precancers (high grade squamous intraepithelial lesions – HSIL) has increased
- the level of screening coverage increased rapidly until 1996 but has since remained static.

The indicators listed above were selected for presentation because cervical screening works mainly by detecting and treating precancerous lesions (in particular HSIL), so decreasing the incidence of invasive cancer. Screening may also decrease the extent of disease at diagnosis, by detecting micro-invasive cancers.

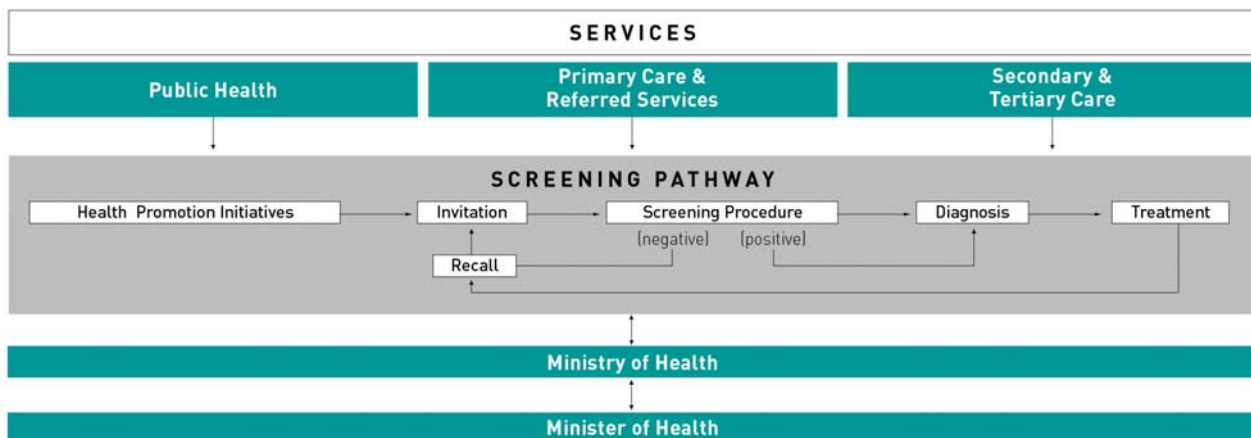
# 1 Introduction

This report brings together data from a number of sources to present a picture of cervical cancer incidence and mortality over time in New Zealand, set alongside data on coverage of women by the National Cervical Screening Programme (NCSP) and some data from overseas.

New Zealand's National Cervical Screening Programme (NCSP) was established in 1991 following the 1988 Inquiry Into *Allegations Concerning The Treatment Of Cervical Cancer At National Women's Hospital* (the Cartwright Inquiry). Prior to this, opportunistic screening took place in many general practices and family planning clinics but there was no organised programme and no national standards.

Success in cervical screening requires a high standard of quality at each step in the screening pathway from invitation and recall of women, through smear taking, laboratory testing, colposcopy and the management and information systems that support these processes (Figure 1).

**Figure 1: The screening pathway**



This review provides a brief statistical overview of key cervical screening indicators for approximately the first decade of the NCSP, from its inception in 1991 to 2002 (the most recent data available). All data have either been previously published in NCSP reports, such as annual statistical reports, annual monitoring reports or quarterly IMG reports (which are available on the NSU website [www.healthywomen.org.nz](http://www.healthywomen.org.nz)).

Cancer incidence and mortality data were provided by the NZHIS, while HSIL and coverage data were extracted from the National Cervical Screening Programme Register (NCSP-R). Rates have been calculated by Public Health Intelligence (PHI), using Statistics New Zealand (SNZ) population estimates for 1991 to 2002, as well as earlier years where relevant. The rates shown in this review have been age standardised to Segi's world population to account for differences in age distribution over time or between groups.

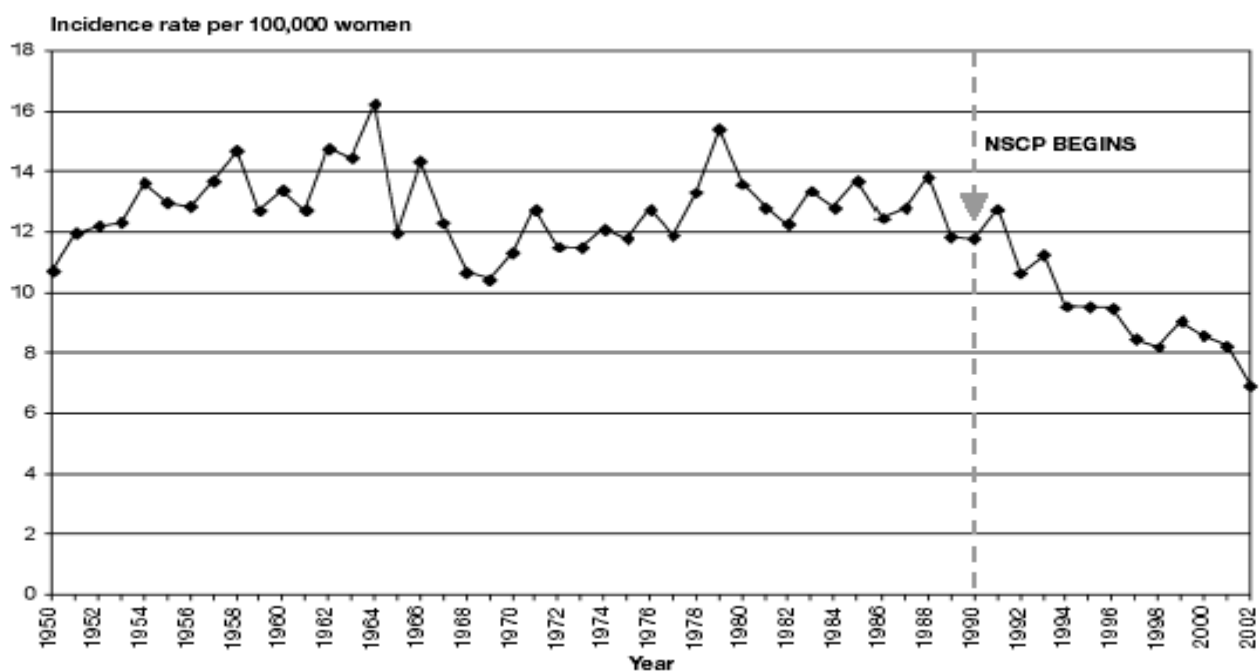
## 2 Invasive Cervical Cancer

### Incidence

#### Total population

The incidence of cervical cancer (adjusting for age) was relatively stable (except for brief fluctuations) from the 1950s, when records began, right through to the late 1980s. From the early 1990s – coinciding with the introduction of the NCSP – incidence decreased from about 12 per 100,000 in 1991 to below 7 per 100,000 in 2002, a steady fall of approximately 40% (Figure 2).

**Figure 2:** Cervical cancer incidence in New Zealand



Source: NZHIS

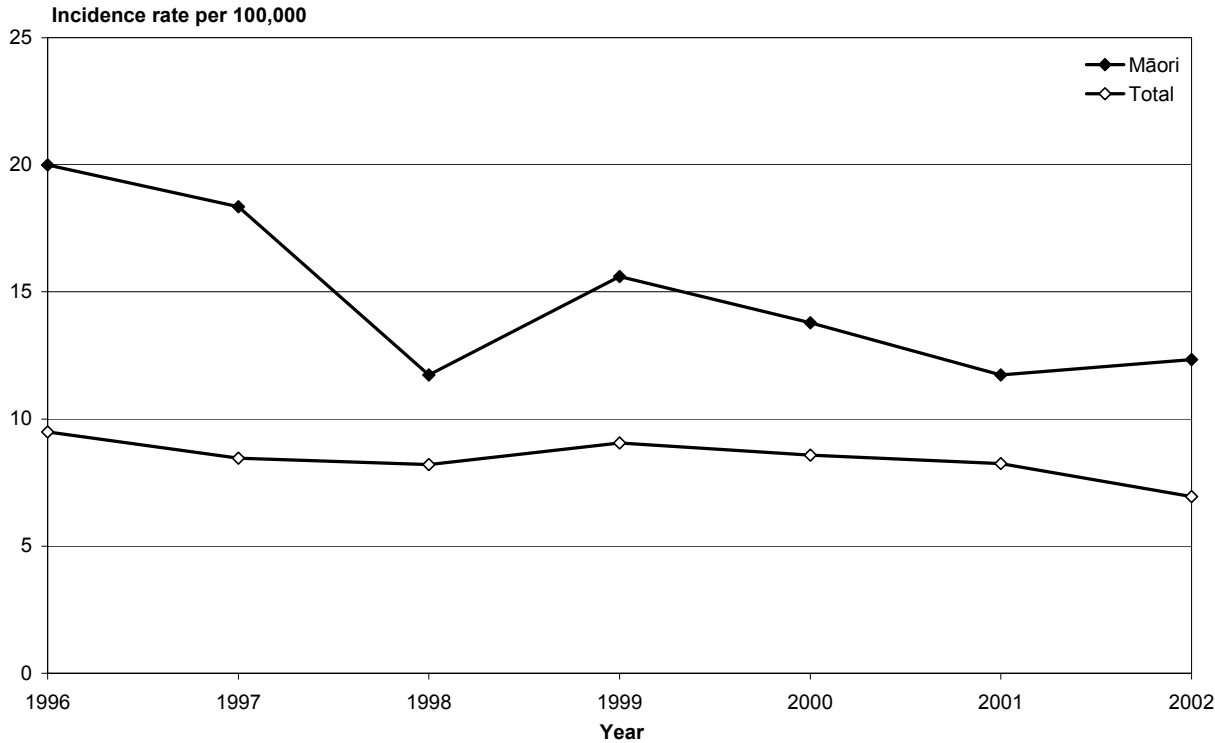
Note: Age-standardised rate (Segi) per 100,000 women.



### Māori population

The incidence of cervical cancer is higher among Māori women than the general population (Figure 3). However, NZHIS data indicates that the gap is closing. In 1996, the first year for which reliable ethnic data is available, the difference between Māori and total rates was 10.5 per 100,000 women (adjusting for age). By 2001, this difference had fallen to only 5.4 per 100,000, a 50 percent decrease in inequality.

**Figure 3:** Cervical cancer incidence, Māori and total population



Source: NZHIS

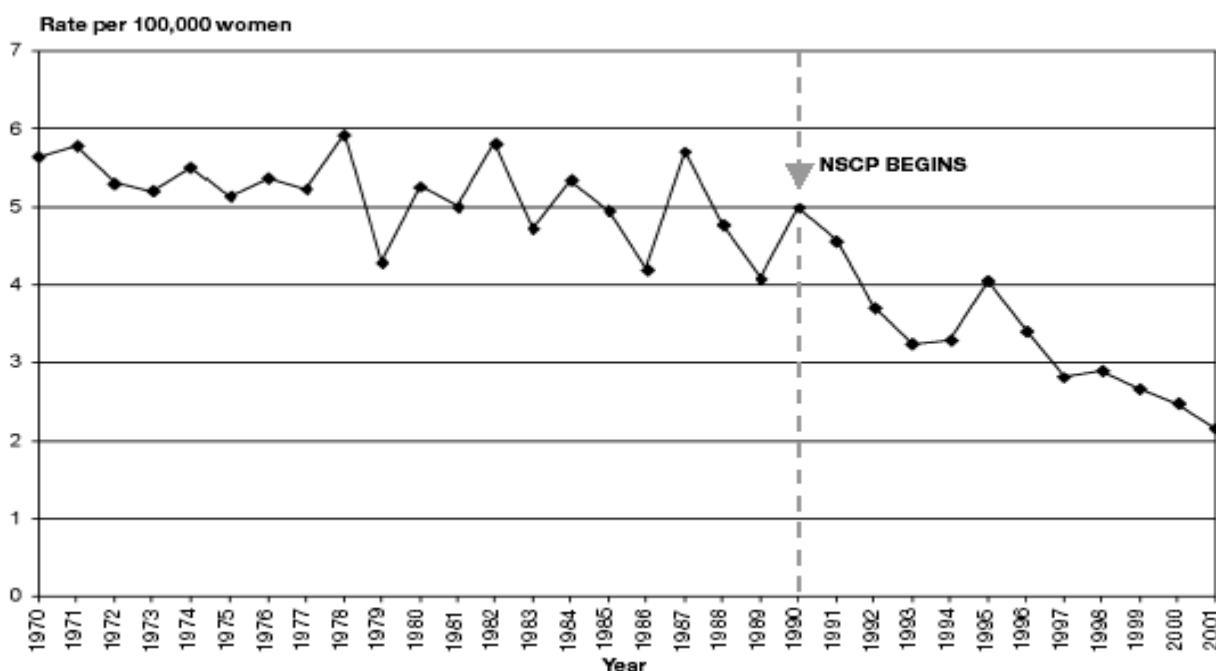
Note: Age-standardised rate (Segi) per 100,000 women.

## Mortality

### Total population

Like incidence, mortality from cervical cancer has also been declining in New Zealand, but over a longer period of time – since the late 1970s. However the rate of mortality decline accelerated sharply from the early 1990s, again coinciding with the introduction of the NCSP (Figure 4). Between 1990 and 2001, mortality fell from 5 per 100,000 to 2 per 100,000, a decline of 60 percent.

**Figure 4:** Cervical cancer mortality in New Zealand



Source: NZHIS

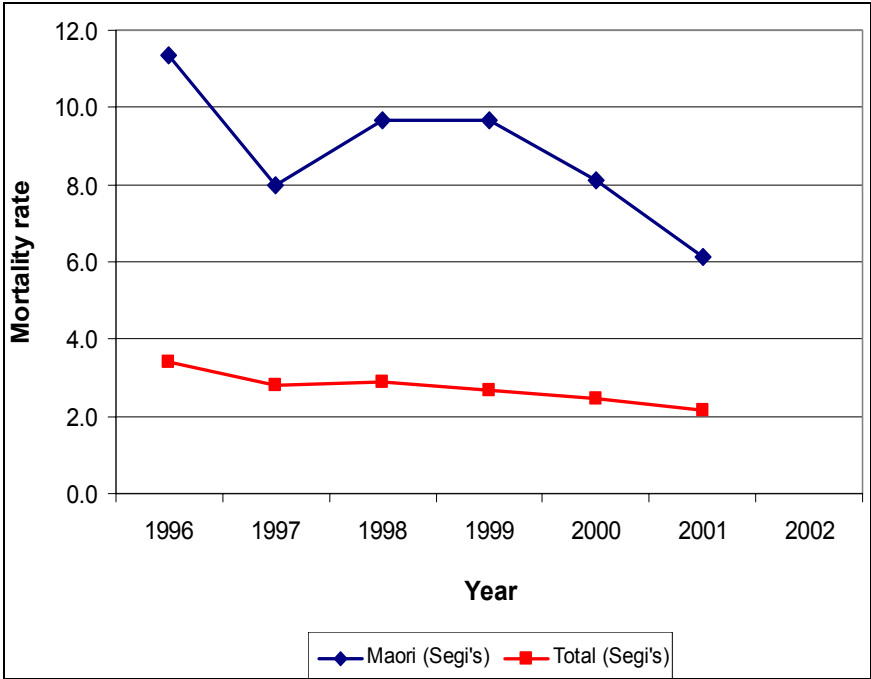
Note: Age-standardised (Segi) per 100,000 women.

The greater relative decrease in mortality (60%) than incidence (40%) over the 1990s, indicates that survival with cervical cancer also improved over this time period. This improvement may indicate better treatment, detection of cervical cancer at an earlier stage as a result of screening, or both. Note that not all of the mortality decline can be attributed to screening, whether opportunistic or organised (after 1991).

### Māori population

Māori have higher mortality from cervical cancer than the general population. As with incidence, however, the gap is closing. From 1996 to 2001 mortality among Māori women fell from 11 per 100,000 to 6 per 100,000 (a 46% decrease), whereas over the same period mortality among all women fell by 35% (adjusting for age) (Figure 5). Not all of the fall in Māori mortality could be attributed to screening (organised or opportunistic).

**Figure 5:** Cervical cancer mortality, Māori and total population



Source: NZHIS

Note: Age-standardised (Segi) per 100,000 women.

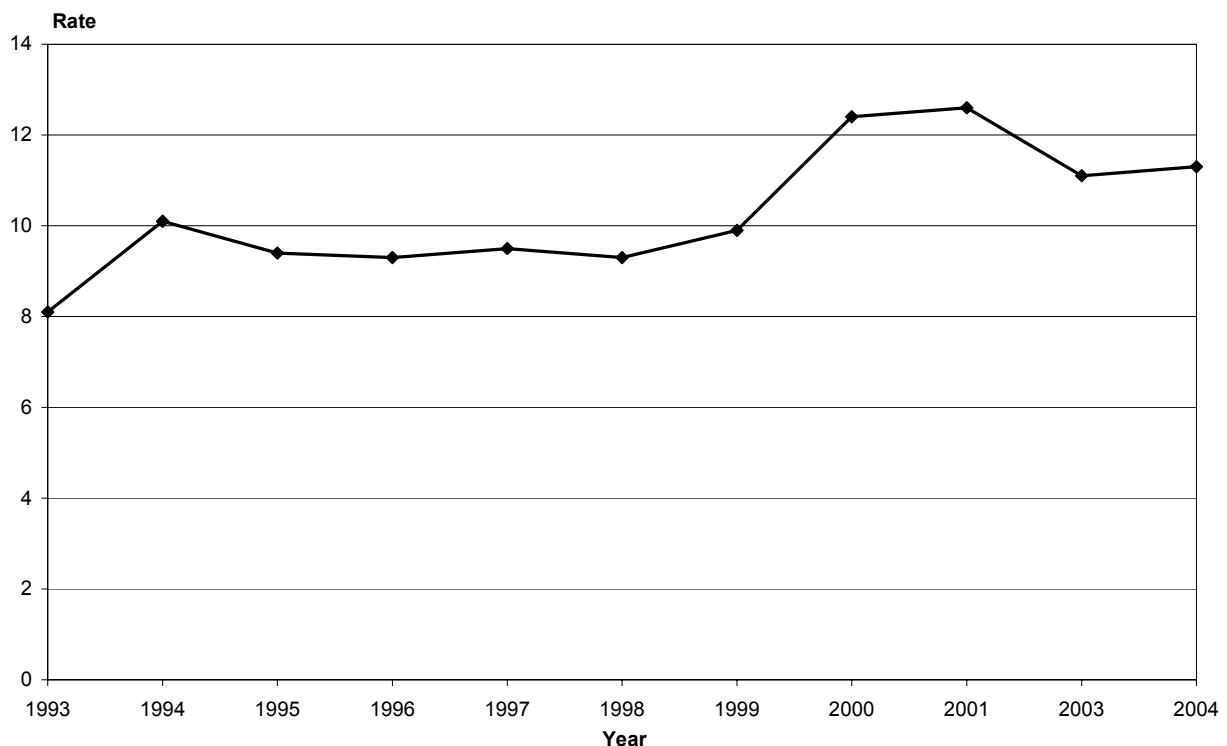
In summary, cervical cancer incidence and mortality fell dramatically over the 1990s for both Māori and non Māori women, coinciding with the introduction of the NCSP. Although Māori rates remain higher than those of the general population, the decline has been steeper for Māori, so narrowing the gap.

Much of the steep fall in incidence after 1991 and some, but not all, of the fall in mortality is likely to be due to organised screening (ie, the NCSP).

### 3 Cervical Precancer (High grade abnormalities - HSIL)

Cervical screening works mainly by detecting precancerous high grade lesions. Figure 6 shows a steep increase in HSIL from 1993 (first year for which data is available) to 1994. The rate then remains reasonably stable until 1998 and then increases slightly to 1999 when a second step increase occurs – possibly reflecting the impact of the Gisborne Inquiry.

**Figure 6:** HSIL incidence rate in New Zealand



Source: PHI, Ministry of Health (data from NCSP-R)

Note: Age-standardised rate (Segi) per 100,000 women.

The overall trend over the decade has been a 40 percent increase in the HSIL detection rate from 8.1 per 1000 women screened in 1993 to 11.3 per 1,000 screened in 2003. This almost exactly mirrors the 40 percent decrease in invasive cervical cancer incidence that has occurred over approximately the same time period – that is, since the NCSP began (see Figure 2).

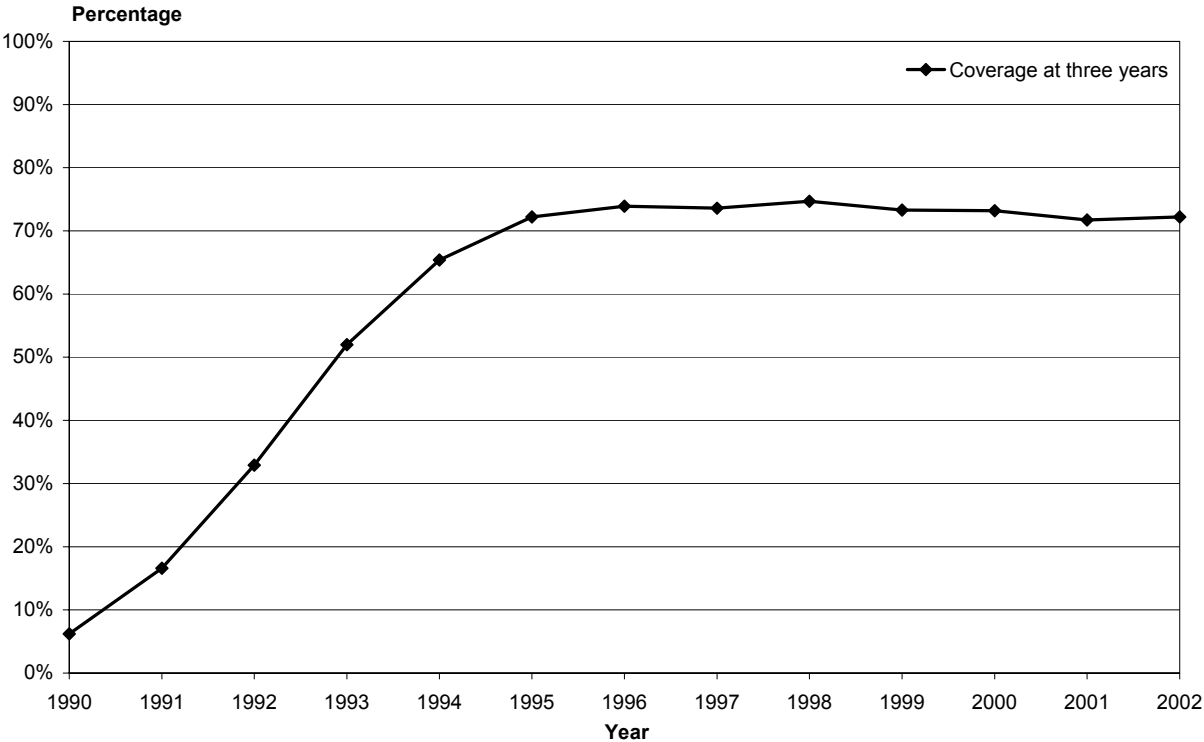
# 4 Coverage

Coverage refers to women who have enrolled in the Programme and have had a smear in the past three years. Coverage is related to protection: a woman who is covered has her risk of cervical cancer reduced by about 90 percent.

Data on coverage in the NCSP is routinely collected and analysed by the National Screening Unit (NSU).

Coverage increased markedly between 1991 and 1996 but has since levelled off (Figure 7). Currently, we estimate that about 73 percent of eligible women (women aged 20–69 years who have not had a hysterectomy) have had a cervical smear in the last three years.

Figure 7: NCSP coverage

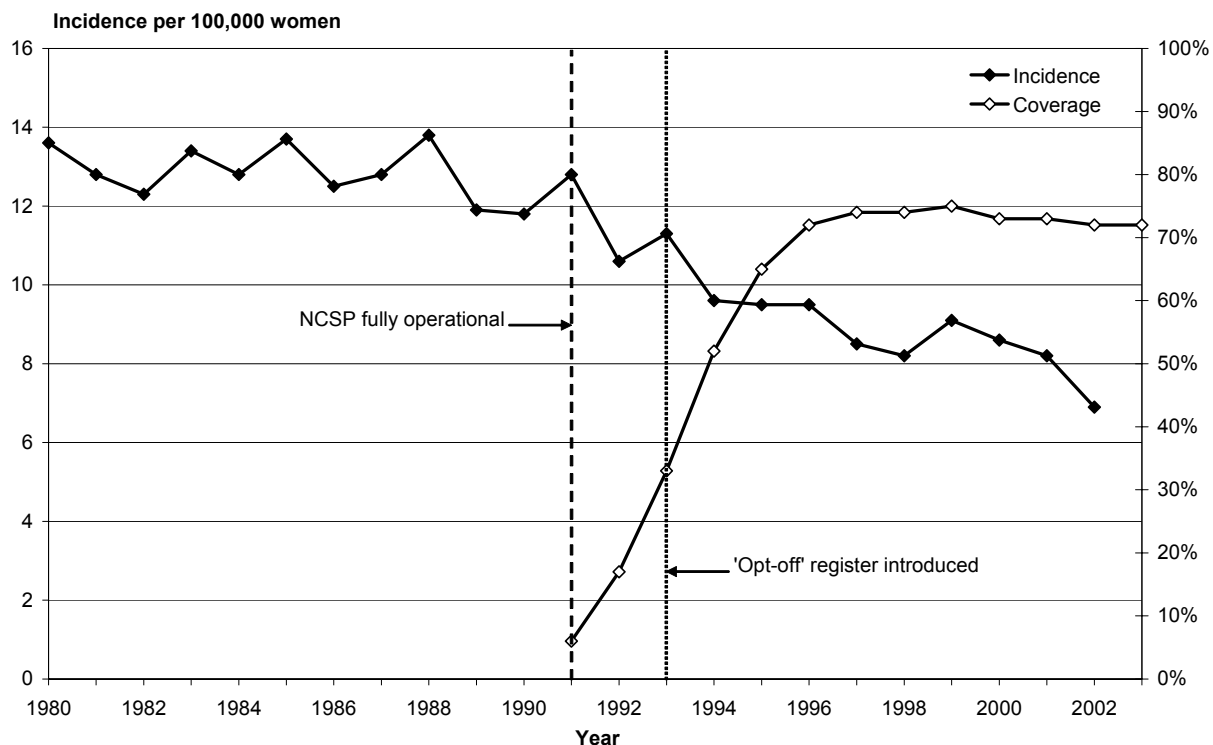


Source: NCSP-R

Coverage began to increase when the NCSP became fully operational in 1991, then increased markedly after the register was made 'opt off' in 1993 (Figure 8).

The steep increase in coverage in the early 1990s coincided with the beginning of the decline in incidence of cervical cancer described above. However, it should be noted that this decline in incidence may partly reflect opportunistic screening in the late 1980s. The continuing decrease in incidence in the late 1990s may reflect the steep increase and sustained high coverage of the NCSP that occurred in the 1990s.

**Figure 8:** Incidence of cervical cancer and NCSP coverage in New Zealand

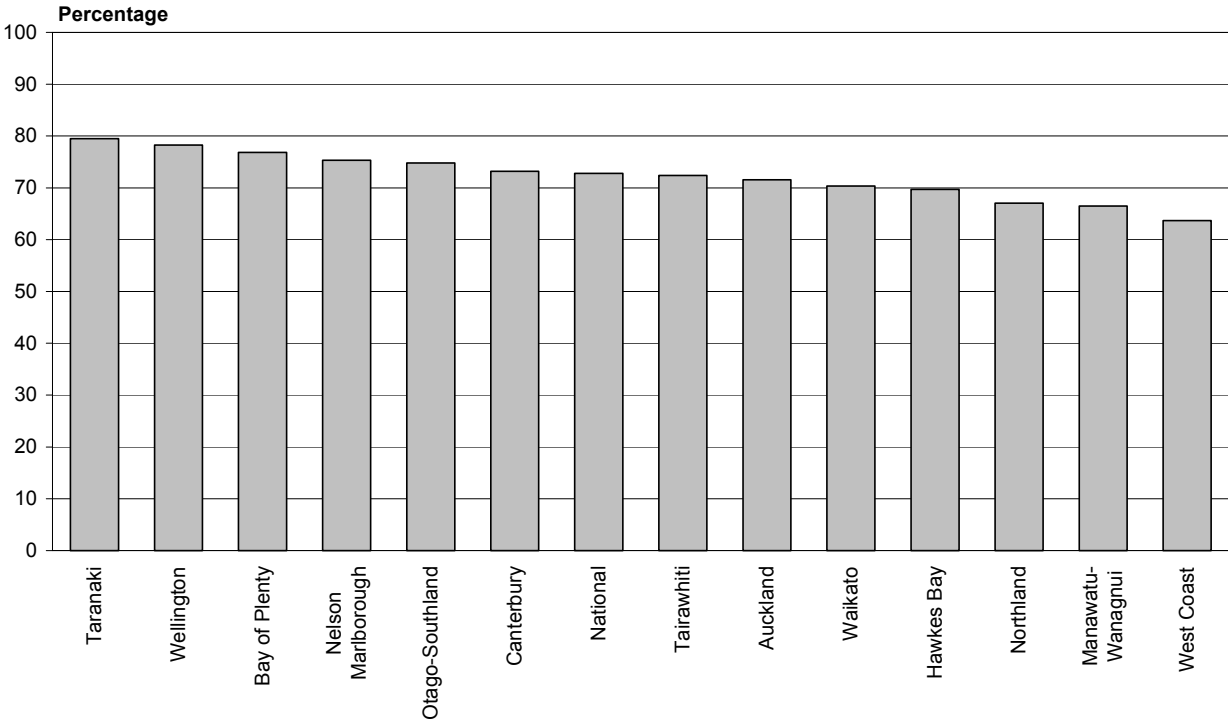


Source: NZHIS and NCSP-R

# Region

In 2003 coverage varied moderately across New Zealand, from a low of 64 percent on the West Coast, to a high of 80 percent in Taranaki (Figure 9).

**Figure 9:** NCSP coverage by region

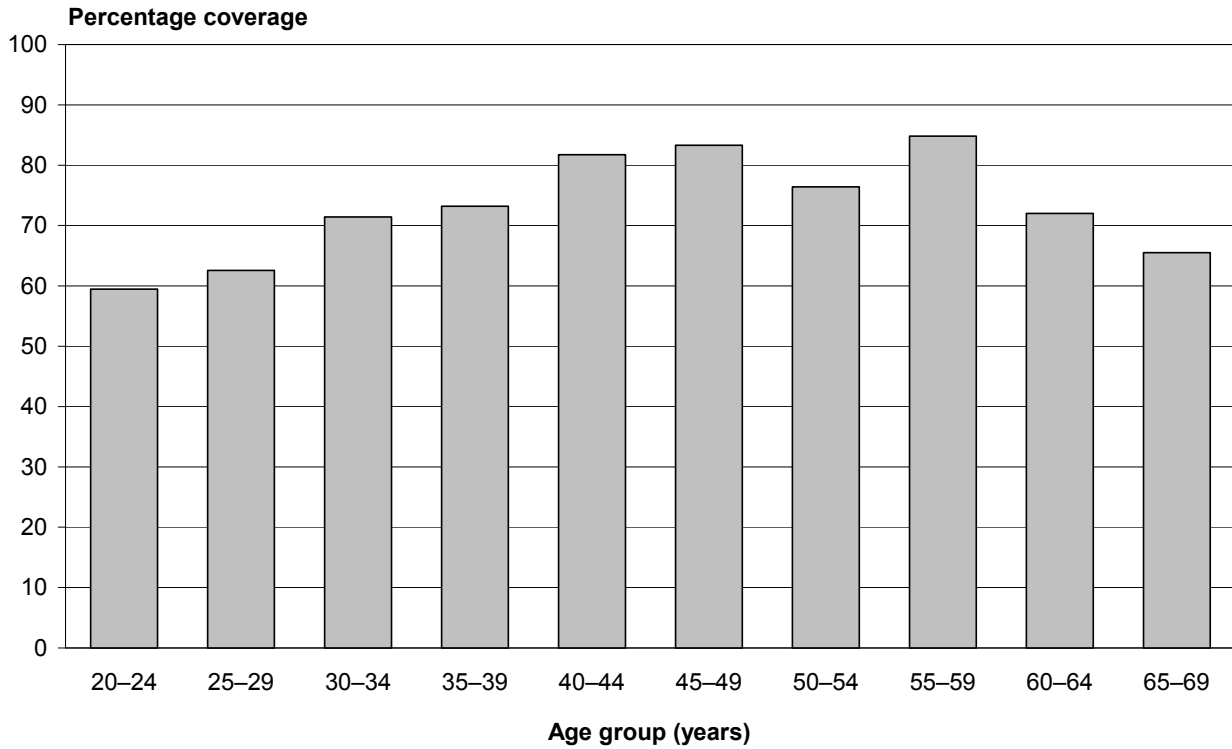


Source: NCSP-R

## Age

Coverage in 2003 varied by age, from a low of 60 percent among women aged 20–24 years, to a high of 85 percent amongst women aged 55–59 years, then declined again to 65 percent among women aged 65–69 years (Figure 10).

**Figure 10:** Coverage by age group



Source: NCSP-R



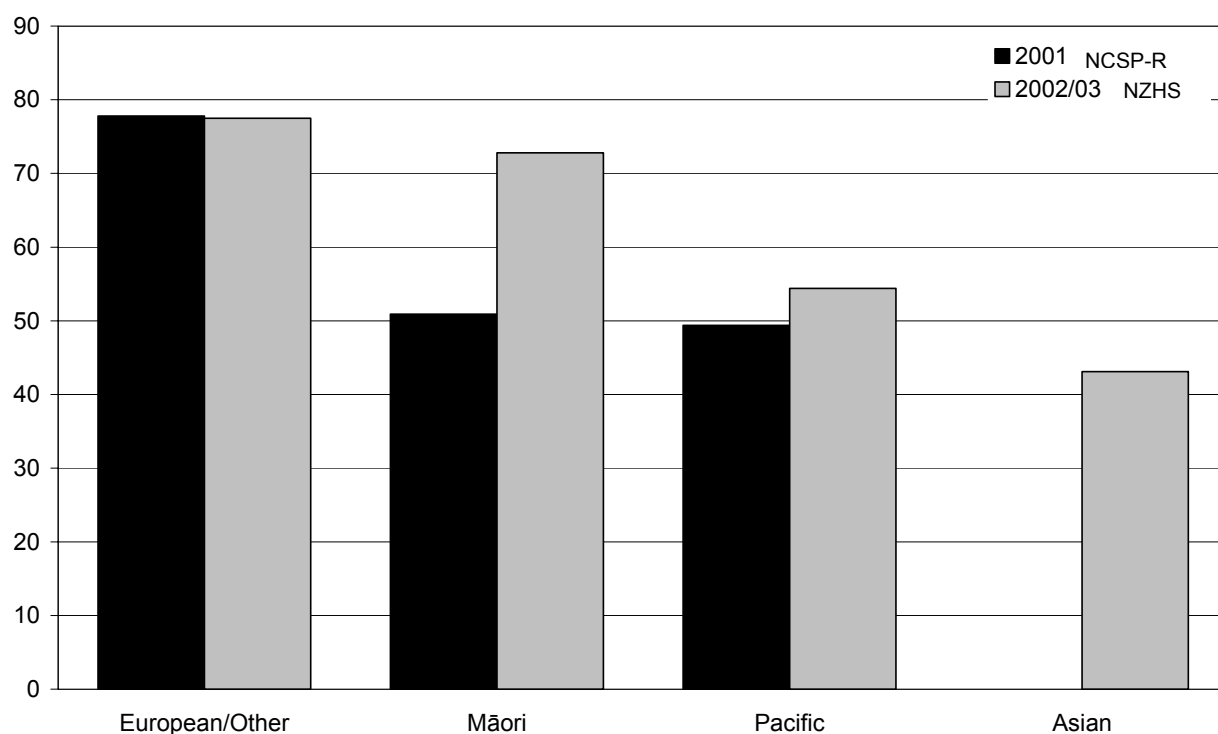
## Ethnicity

Coverage data is collected by ethnicity on the NCSP-R and is shown in Figure 11 for 2001. However, there is evidence that the coding of ethnicity data on the NCSP-R underestimates coverage for Māori (CCA report, November 2004).

*Self reported* coverage is available by ethnicity for 2002/03 from the New Zealand Health Survey (NZHS 2002/03). This source estimates a higher coverage for Māori than does the NCSP-R, but a lower coverage for Pacific and Asian women (Figure 11).

Both estimates (the NCSP-R and the NZHS) are provided in Figure 11 as it is not clear which is more accurate.

**Figure 11:** Coverage by ethnicity (hysterectomy adjusted)



**Table 1**

Source: NCSP-R, NZHS

The estimates for Pacific and Asian woman are statistically significantly lower than for European and Māori women. There was no significant difference in the estimates for European and Māori women.

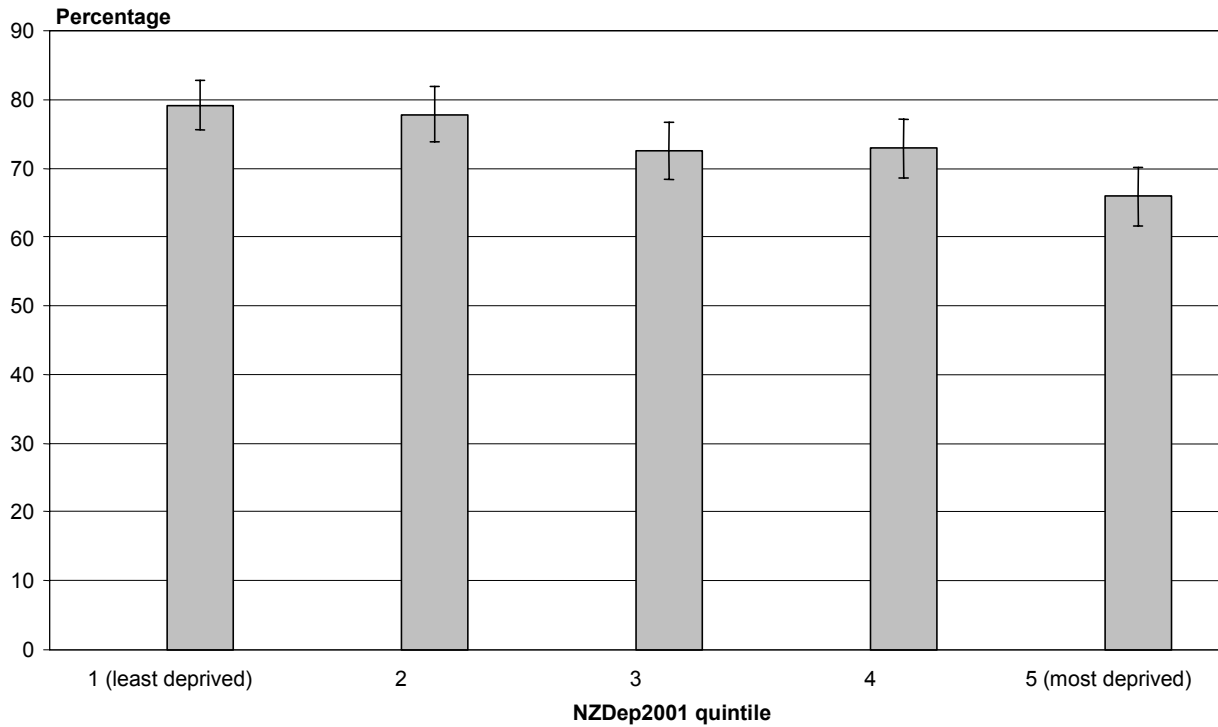
## Socioeconomic position

The New Zealand Deprivation index 2001 (NZDep2001) can be applied to population data, allocating each individual to a socioeconomic group based on place of residence.

A population can then be divided into five groups – or quintiles – with quintile 1 containing the least deprived, and quintile 5 containing the most deprived women.

Self reported coverage by NZDep2001 is available from the New Zealand Health Survey 2002/03 (Figure 12).

**Figure 12:** Coverage by deprivation quintile



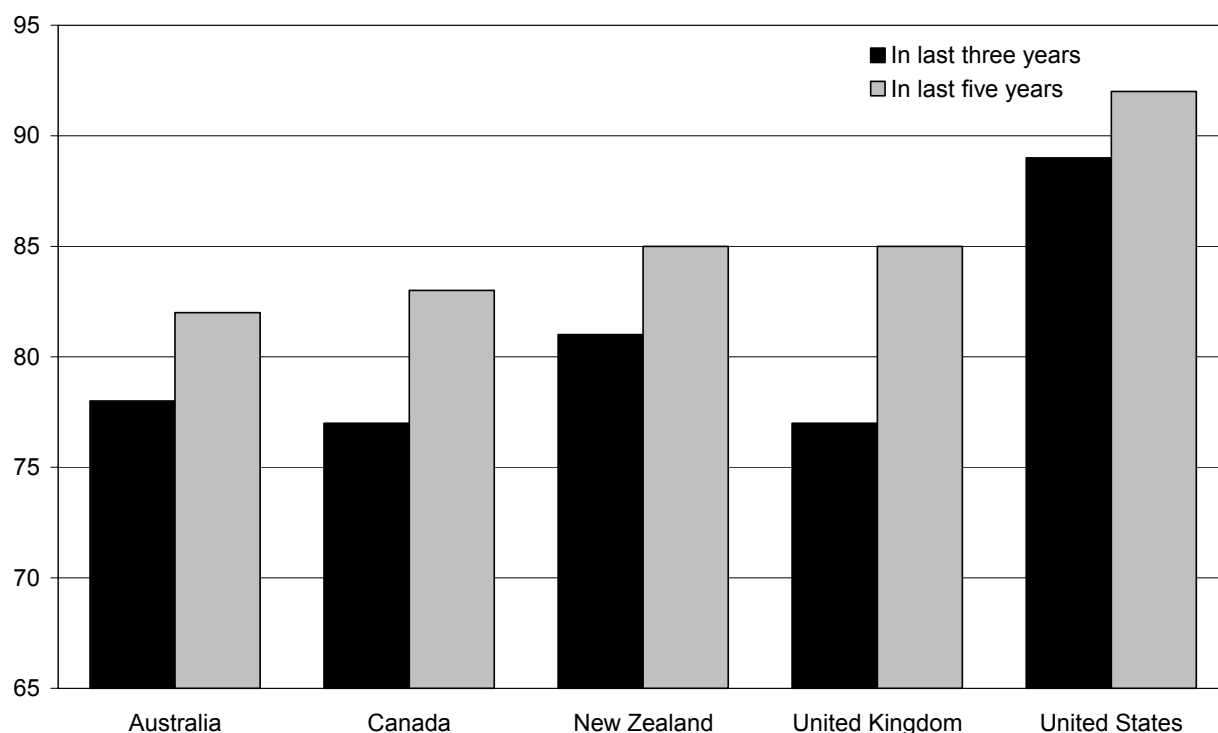
Source: NZHS

Eligible women living in NZDep2001 quintile 1 (least deprived) small areas were approximately 20 percent more likely than eligible women living in quintile 5 (most deprived) small areas to have had a cervical smear in the last three years. This difference is statistically significant.

## International comparisons in coverage

In 2004 the Commonwealth Fund carried out a well designed, standardised health survey in five countries including New Zealand, that included questions about cervical smears (Figure 13).

**Figure 13:** Percentage of women aged 25–64 years self-reporting a cervical smear within the previous three and five years, by country



New Zealand's reported 81 percent three-year coverage is less than that of the US (89%), but better than that of Australia (78%), Canada (77%) and the UK (77%). Note that the estimate for New Zealand (81%) is higher than that found in the NCSP-R for 2002/03 and the New Zealand Health Survey (73% in both).

## 4 Discussion

Cervical cancer incidence and mortality fell steadily in New Zealand during the 1990s and early 2000s. The decline in incidence probably began during the late 1980s. The decline in mortality has been apparent since the 1970s. These trends are likely to be partly due to the introduction and subsequent increase in coverage of the NCSP, partly due to opportunistic screening prior to the introduction of the NCSP and partly due to other factors, unrelated to screening.

Incidence and mortality are higher among Māori than among the general population, although in recent years (since 1996) the Māori – non Māori inequality has steadily narrowed.

While the overall findings are very encouraging, recent age/period/cohort modelling work carried out by PHI for the NCSP (PHI 2004) found that it will become harder to achieve similar gains in incidence and mortality in the future. This is because of a strong cohort effect (women born during the 1940s and 1950s seem to be at higher risk of cervical cancer than earlier and later cohorts).

The PHI model provides a better estimate of the impact of the NCSP to date than is apparent from the incidence and mortality rates alone. It shows that incidence rates would have risen rapidly over the 1990s and 2000s (because of the cohort effect) had it not been for screening. This was also found to be the case in a recent study by Peto et al for the United Kingdom (Peto J et al). These studies show that cervical screening seems to have prevented a major epidemic of cervical cancer in New Zealand, as it has in the United Kingdom.

Coverage of the NCSP has stabilised at about 73 percent overall for the last five years. That is, since the late 1990s about 73 percent of eligible women in New Zealand have had a cervical smear in the preceding three years. Coverage varies, however, by region, age group, ethnicity and degree of deprivation. Coverage is lowest among Pacific and Asian women (at approximately 50%), intermediate among Māori women (at about 60–70% in different datasets) and highest among European women (at close to 80%).

Coverage of cervical screening is high in New Zealand compared with the other countries included in the Commonwealth Fund Survey (although cross country comparisons should be treated with caution). On the other hand, inequalities still exist in the cervical cancer burden – between age groups, ethnic groups, social classes and regions. While considerable progress has been made since the NCSP was established over a decade ago, coverage among Māori and ethnic minority women in particular is the key challenge for the next decade.

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## Glossary

Age standardisation	Rates in which there is an adjustment for differences in age distribution of populations.
Coverage	Enrolled women who have a smear recorded on the register during the previous three years.
HSIL:	High grade squamous intraepithelial lesion. A cytological diagnosis encompassing CIN 2 and CIN 3 (carcinoma in situ).
Incidence of cervical cancer	The number of new cases of cervical cancer which are diagnosed or reported during a defined period of time in a specified population.
Invasive cancer of the cervix	Cancerous cells have spread beyond the surface epithelium into underlying tissue.
Mortality from cervical cancer	The number of deaths from cervical cancer during a defined period of time in a defined population.
NZDep	A generic term used to refer to the NZDep91, NZDep 96 and NZDep 2001 indexes of socioeconomic deprivation. The index provides a deprivation score from 1–10 for small areas where 1 represents the least deprived 10 percent of areas and 10 represents the most deprived ten percent of areas.