Cancer Prevention: the gap between what we know and what we do

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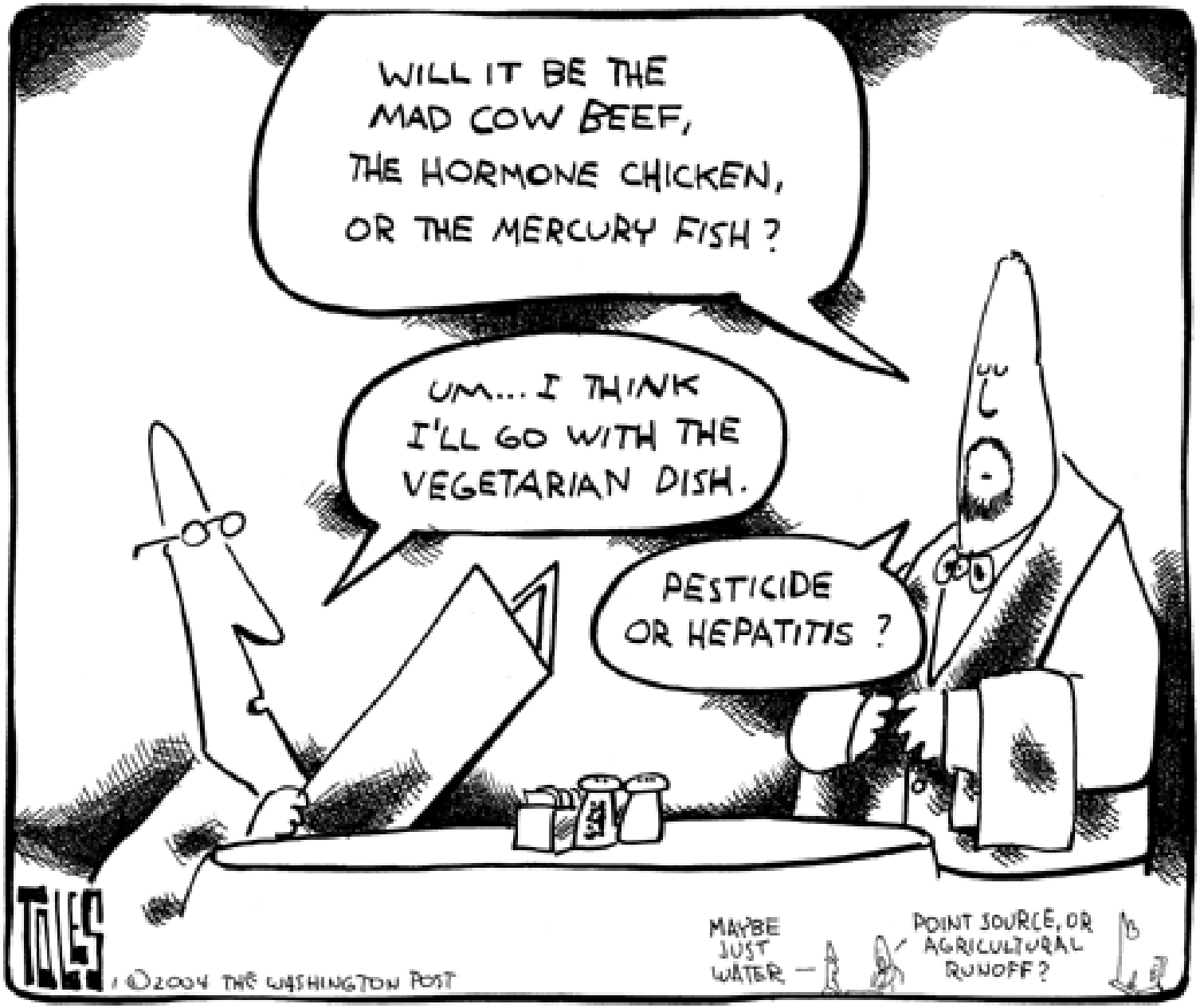
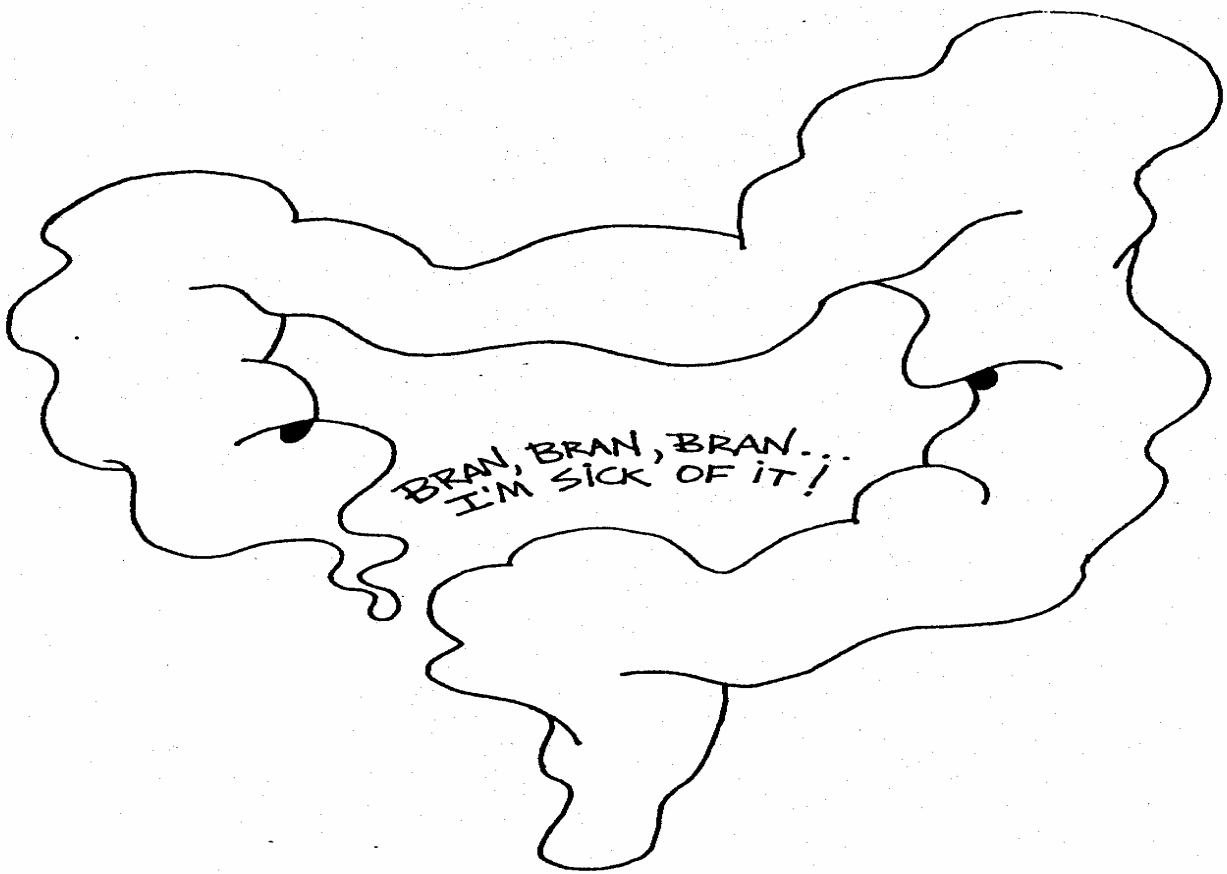

WILL IT BE THE MAD COW BEEF, THE HORMONE CHICKEN, OR THE MERCURY FISH?
UM... I THINK I'LL GO WITH THE VEGETARIAN DISH.
PESTICIDE OR HEPATITIS?
TOLES
©2004 THE WASHINGTON POST
MAYBE JUST WATER —
POINT SOURCE, OR AGRICULTURAL RUNOFF?



IRRITABLE BOWEL SYNDROME

Global Trends

Global Trends

- **Increasing population**
- **Aging**
- **Increasing incidence rates**
- **10.3 million cases in 1996 →14.7 million cases in 2020**

Cancer as a Cause of Death in the World: 1985 & 2015

Cause of Death as % of all deaths	Developing Countries		Developed World	
	1985(%)	2015(%)	1985(%)	2015(%)
Cancer	7	14	18	18
Total Deaths (millions):	37.9	47.8	12.0	14.5
Cancer Deaths (millions):	2.7	6.7	2.2	2.6

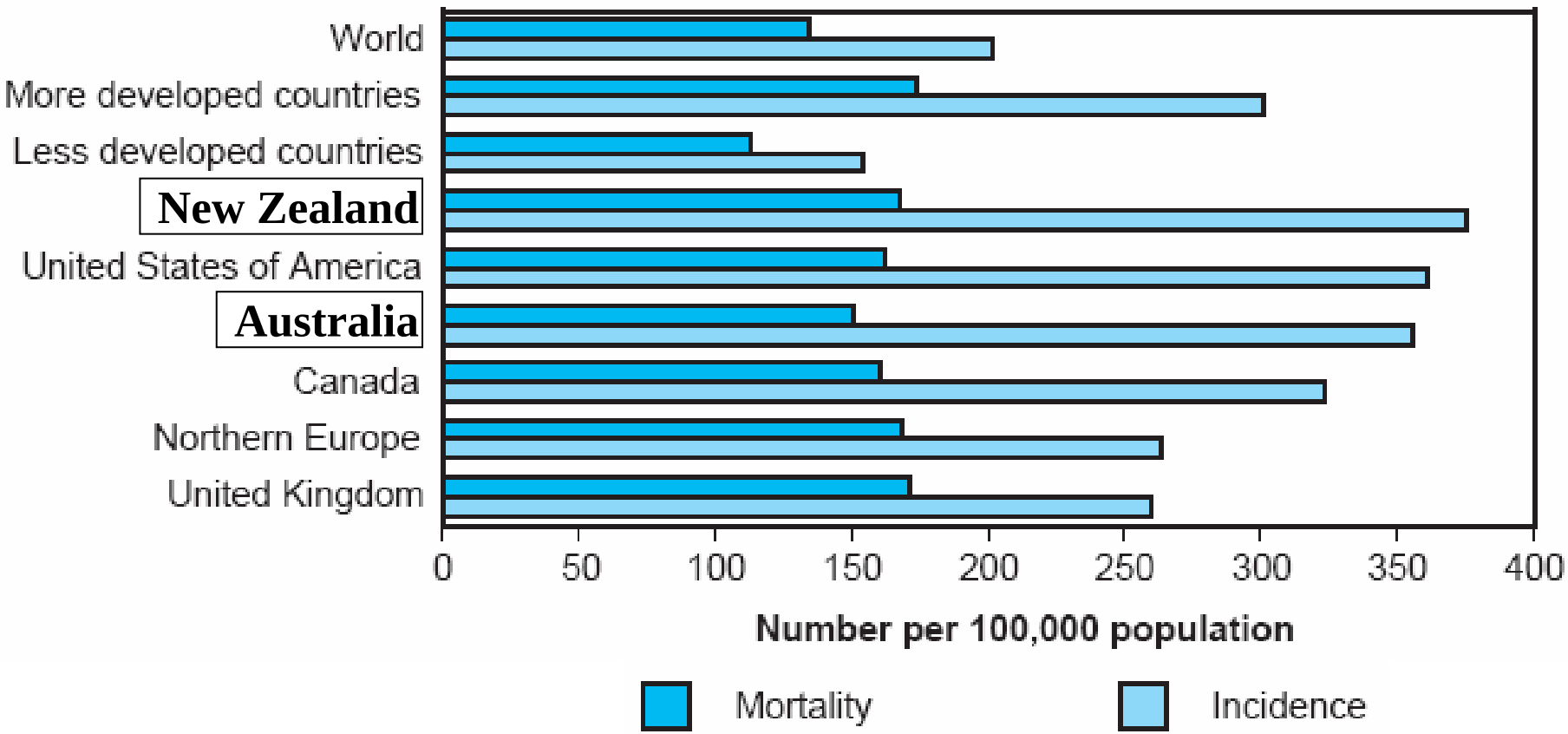
Adapted from Bulatao & Stephens, (1990); Mosley, et al. (1993)

Food, Nutrition and the Prevention of Cancer: a global perspective

World Cancer Research Fund

American Institute for Cancer Research

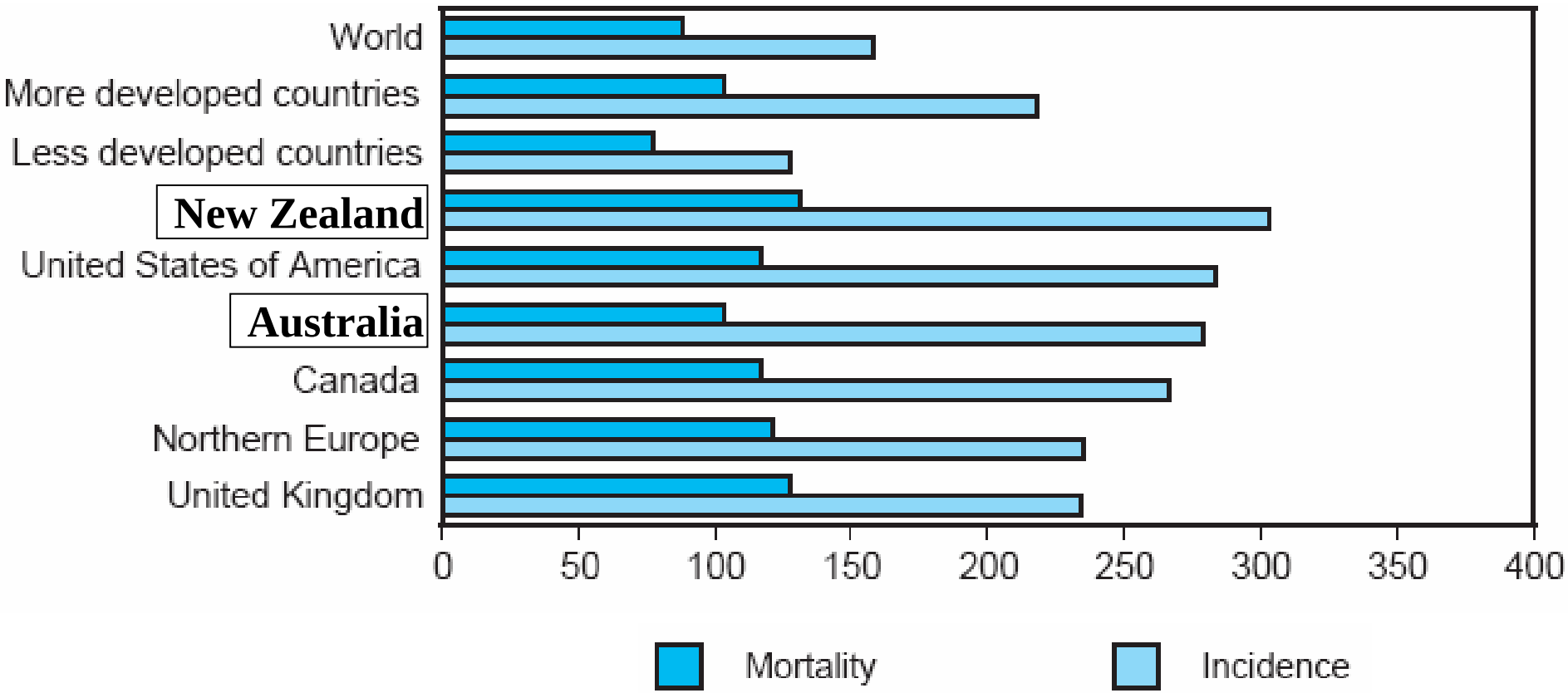
International Comparison for Incidence and Death Rates for All Cancers for Males, 2001



Note: Rates have been age-standardised to the World Standard Population.

Source: IARC 2001.

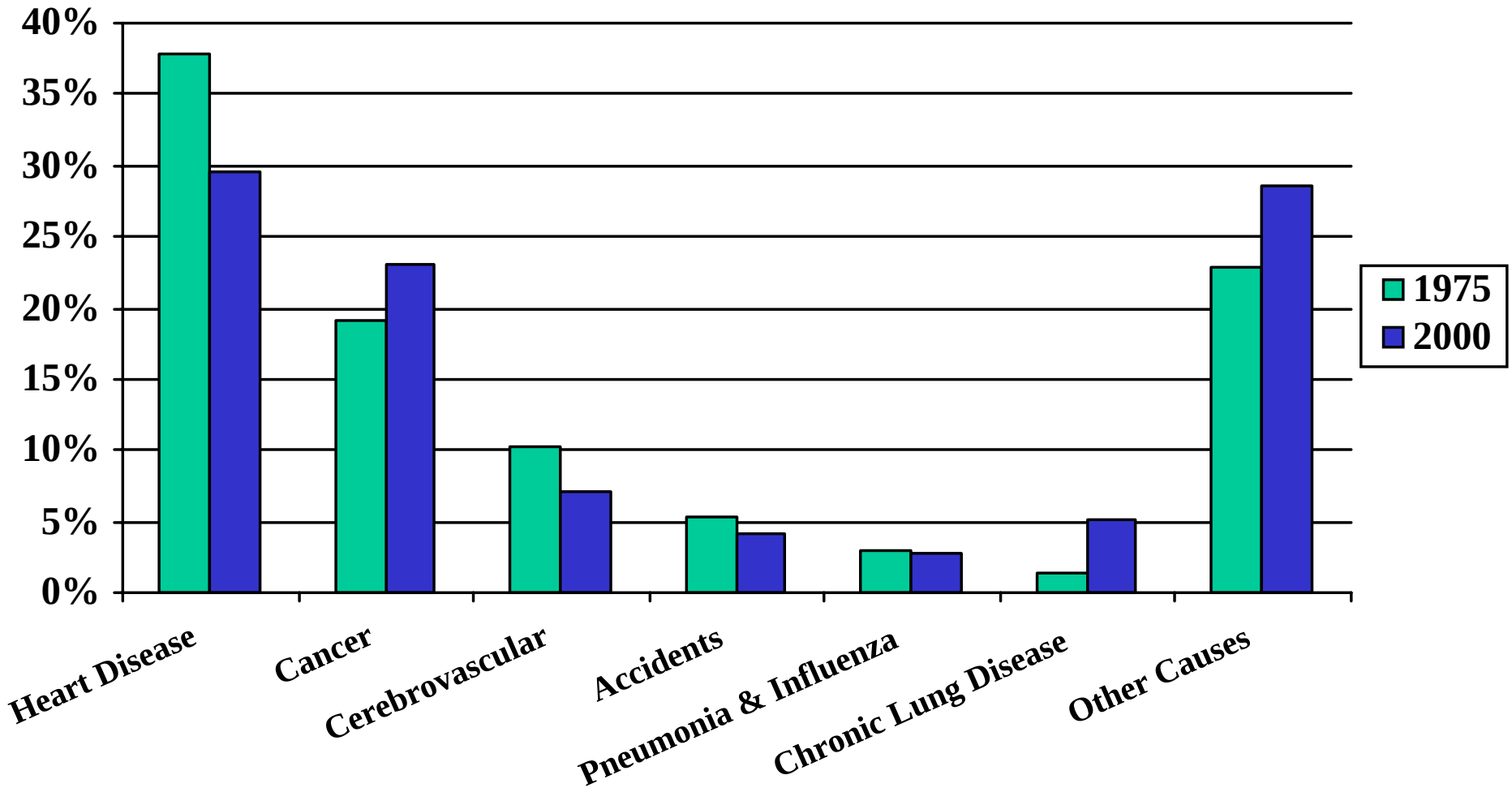
International Comparison for Incidence and Death Rates for All Cancers for Females, 2001



Note: Rates have been age-standardised to the World Standard Population.

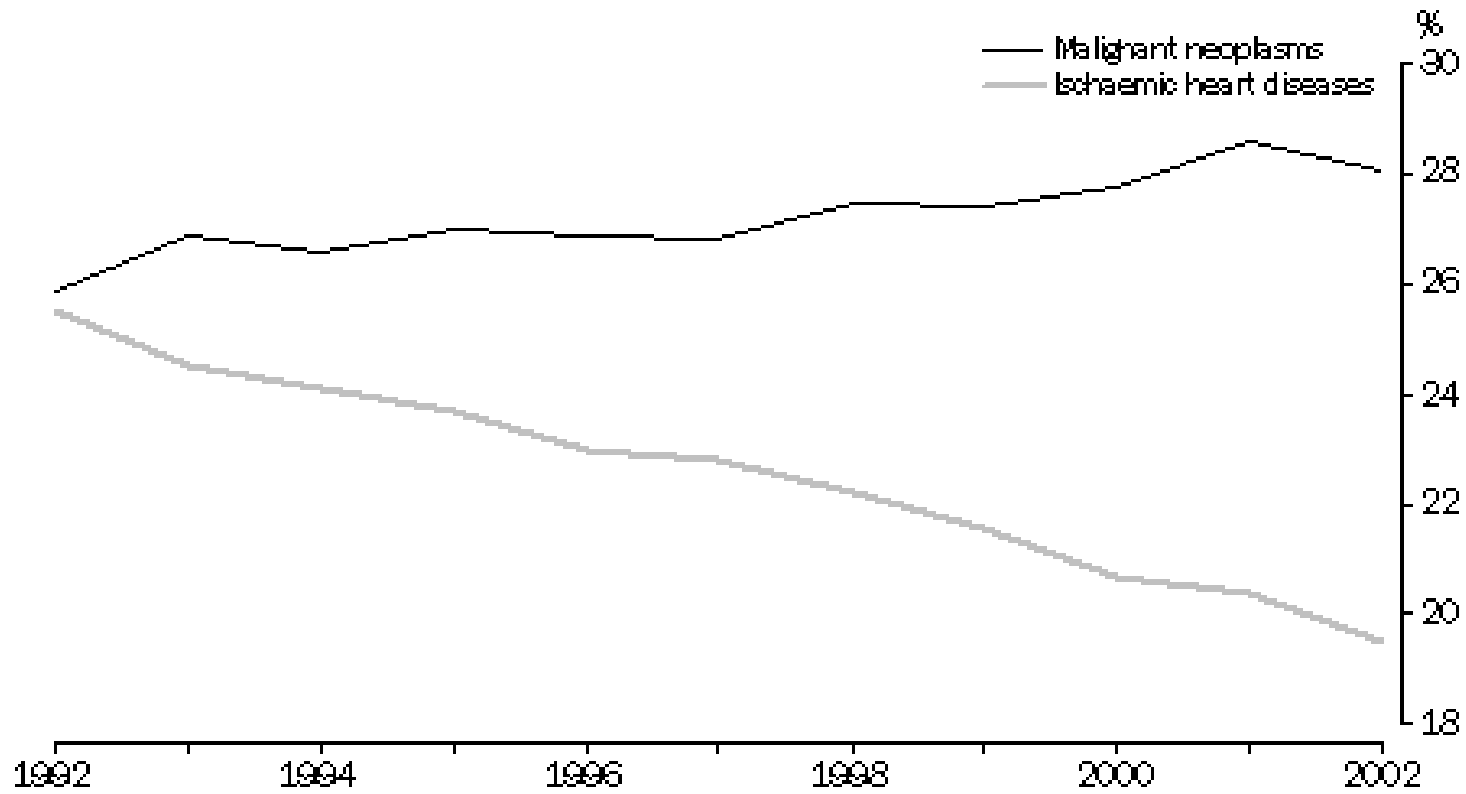
Source: IARC 2001.

Leading Causes of Death in the US
Percent of All Causes of Death, 1975 vs 2000



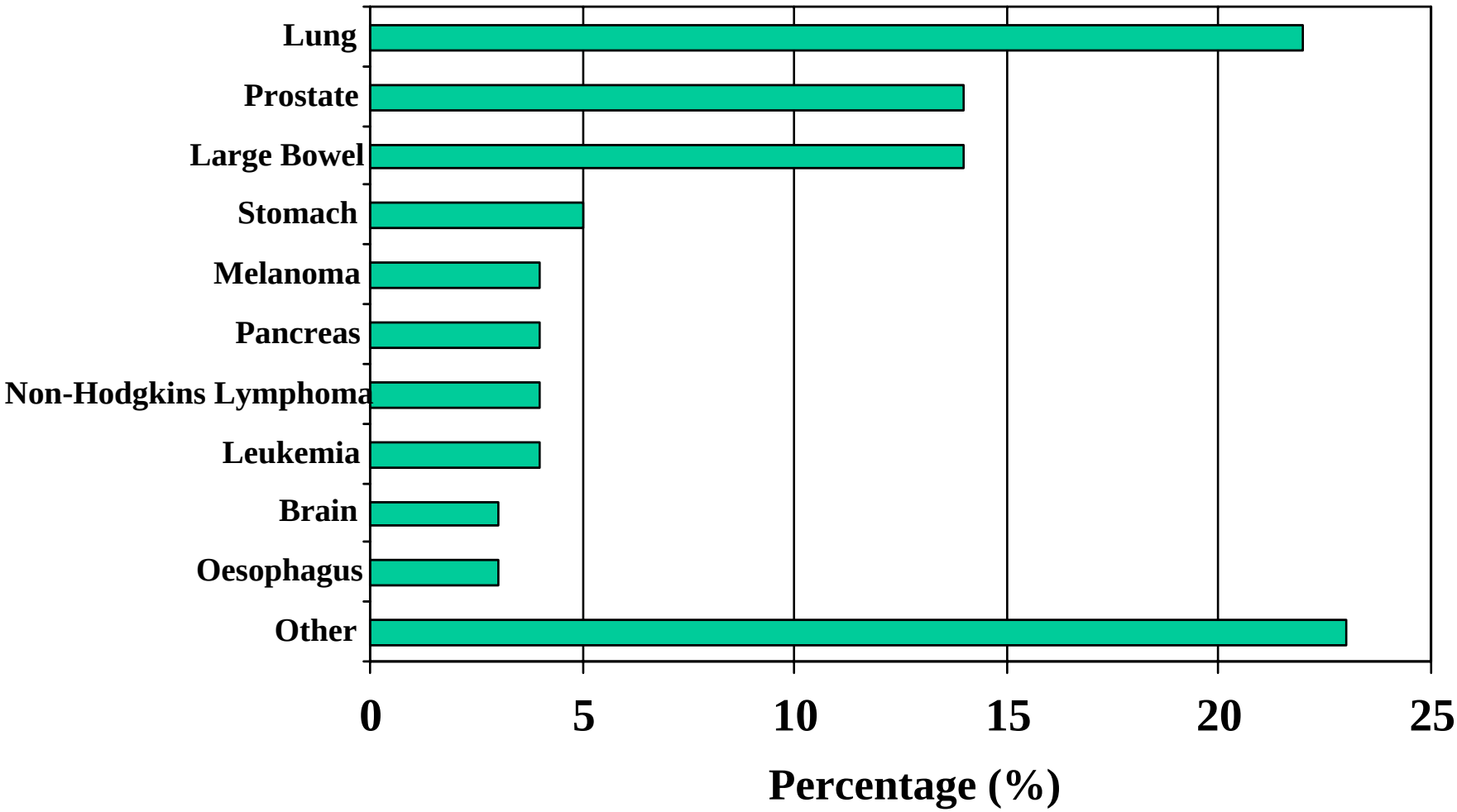
Source: SEER Cancer Statistics Review, 1975-2000, (NCI 2003); access at http://seer.cancer.gov/csr/1975_2000

Death by Cancer versus Heart Disease, Percent of All Causes of Death Australia, 1992-2002



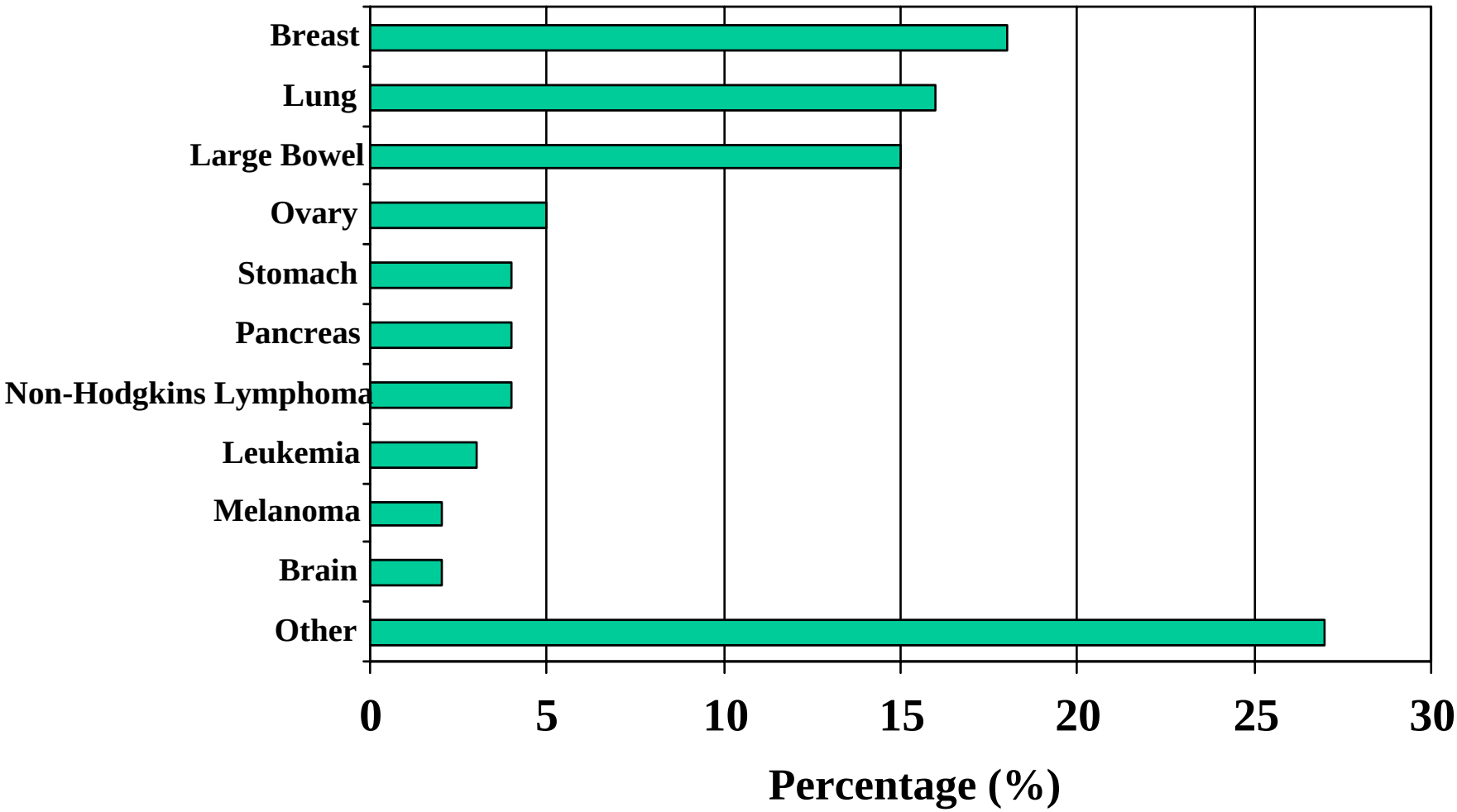
*Source: Australian Bureau of Statistics. 3303.0 Causes of Death, Australia, 2003.*accessed at http://www.abs.gov/ausstats

Cause of Cancer Deaths -- Males
New Zealand, 1999



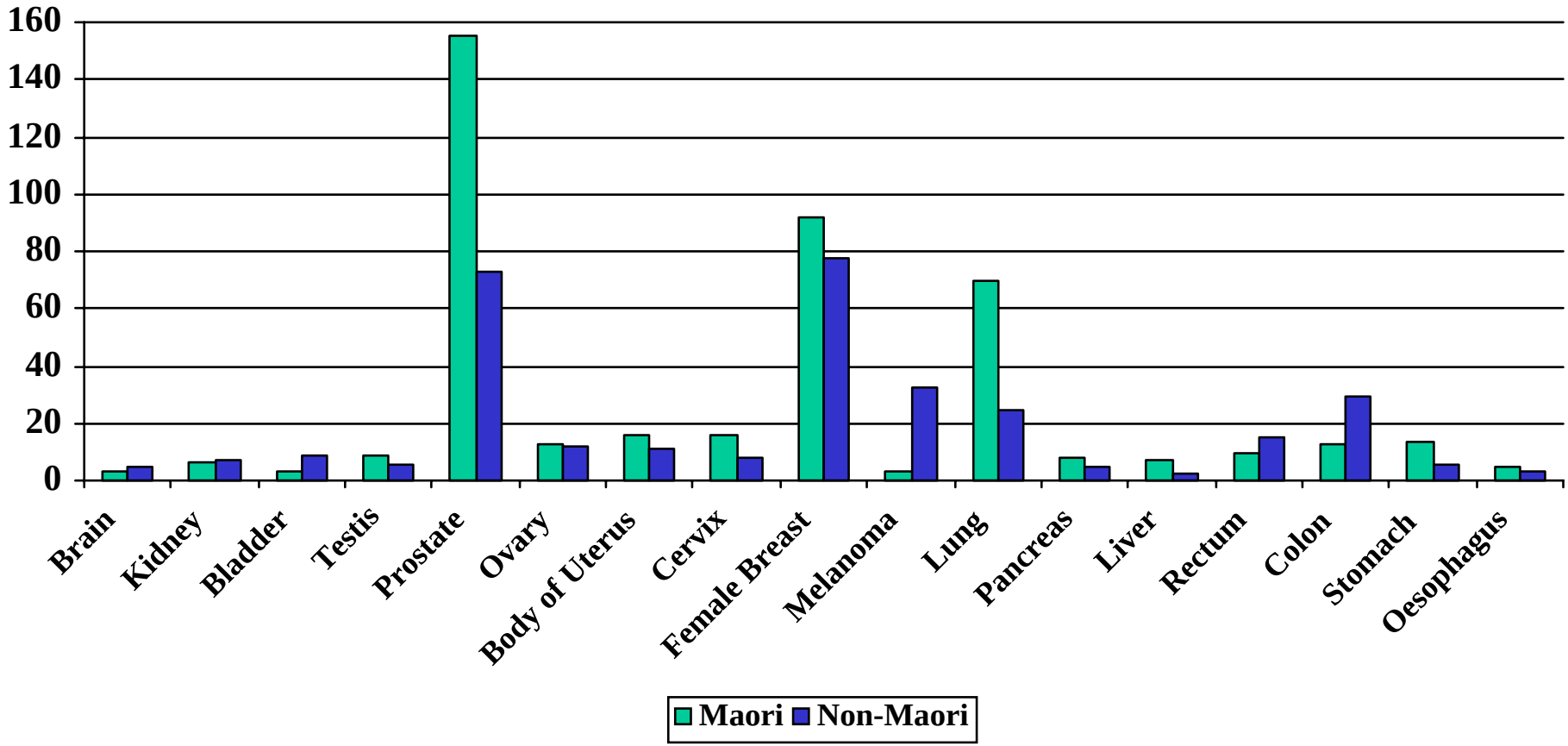
Source: *Cancer: New Registrations and Deaths 1999*. Health Statistical Services, Ministry of Health, Wellington, 2002.

Cause of Cancer Deaths -- Females New Zealand, 1999



Source: *Cancer: New Registrations and Deaths 1999*. Health Statistical Services, Ministry of Health, Wellington, 2002.

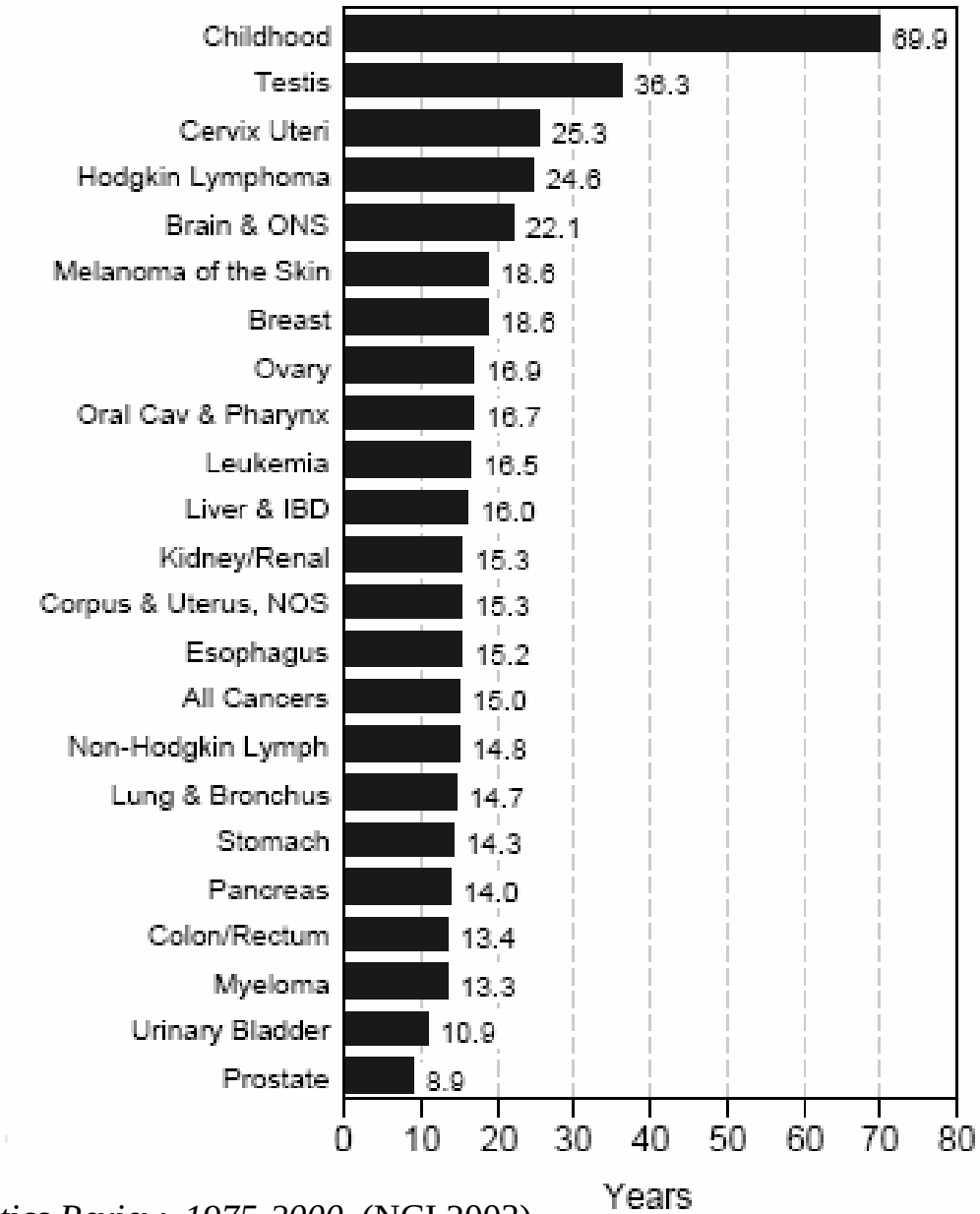
Maori and Non-Maori Cancer Rates New Zealand, 1999



* Rates per 100 000 and age-standardised to Segi's world population

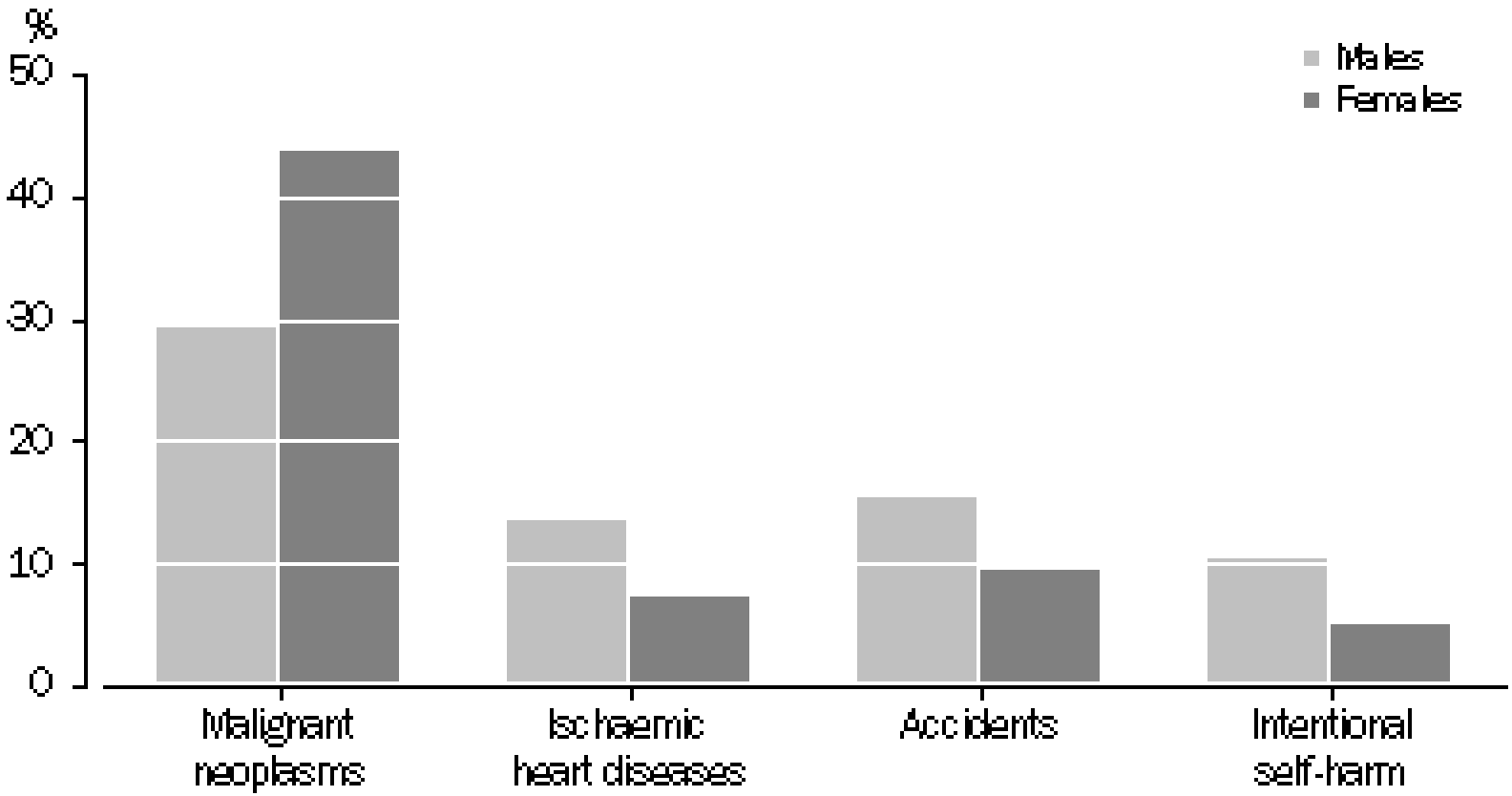
Source: *Cancer: New Registrations and Deaths 1999*. Health Statistical Services, Ministry of Health, Wellington, 2002

Average Years of Life Lost from Cancer, USA



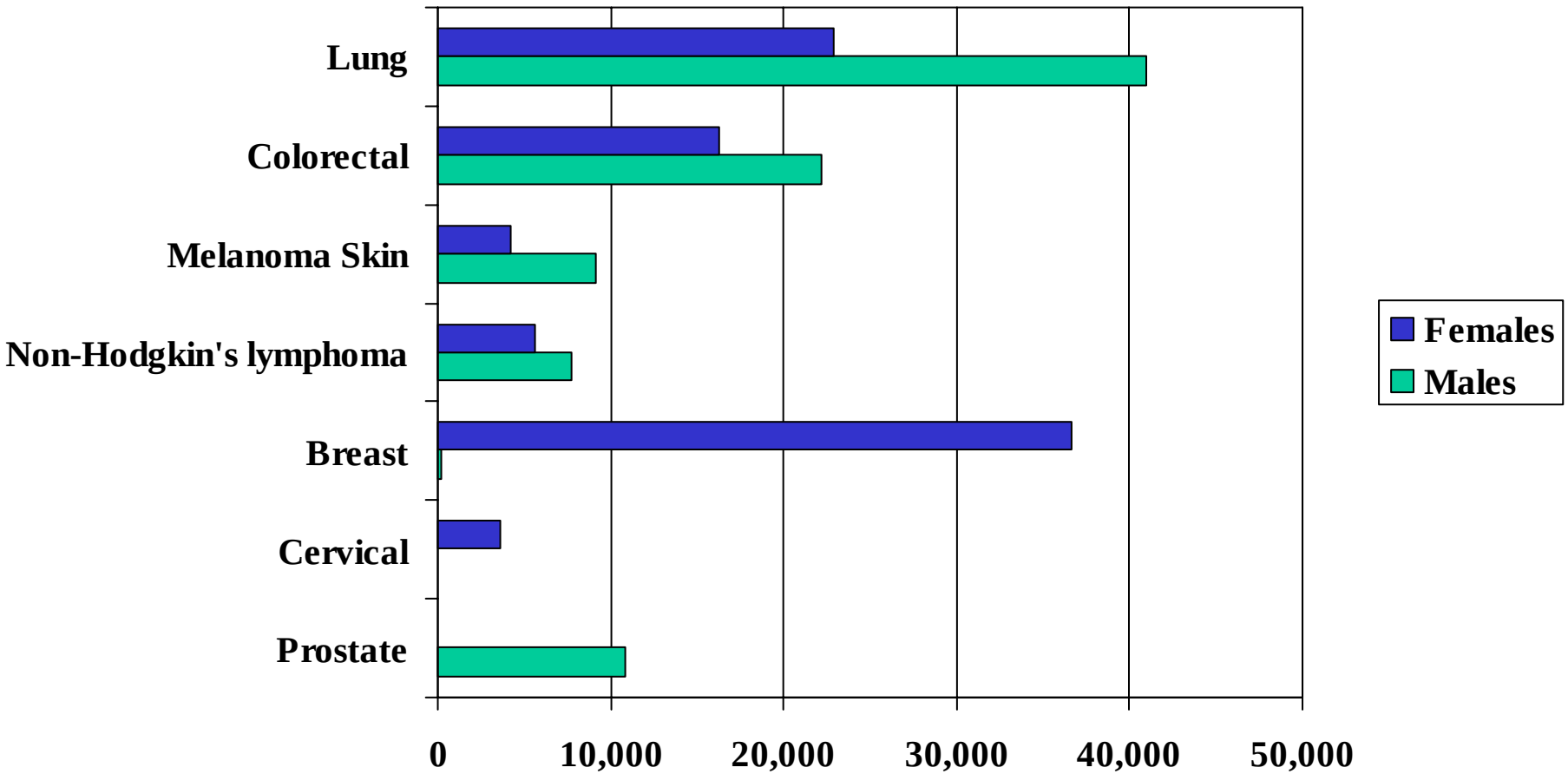
Source: SEER Cancer Statistics Review, 1975-2000, (NCI 2003)

Percentage of Years of Potential Life Lost from Selected Causes, Australia, 2002



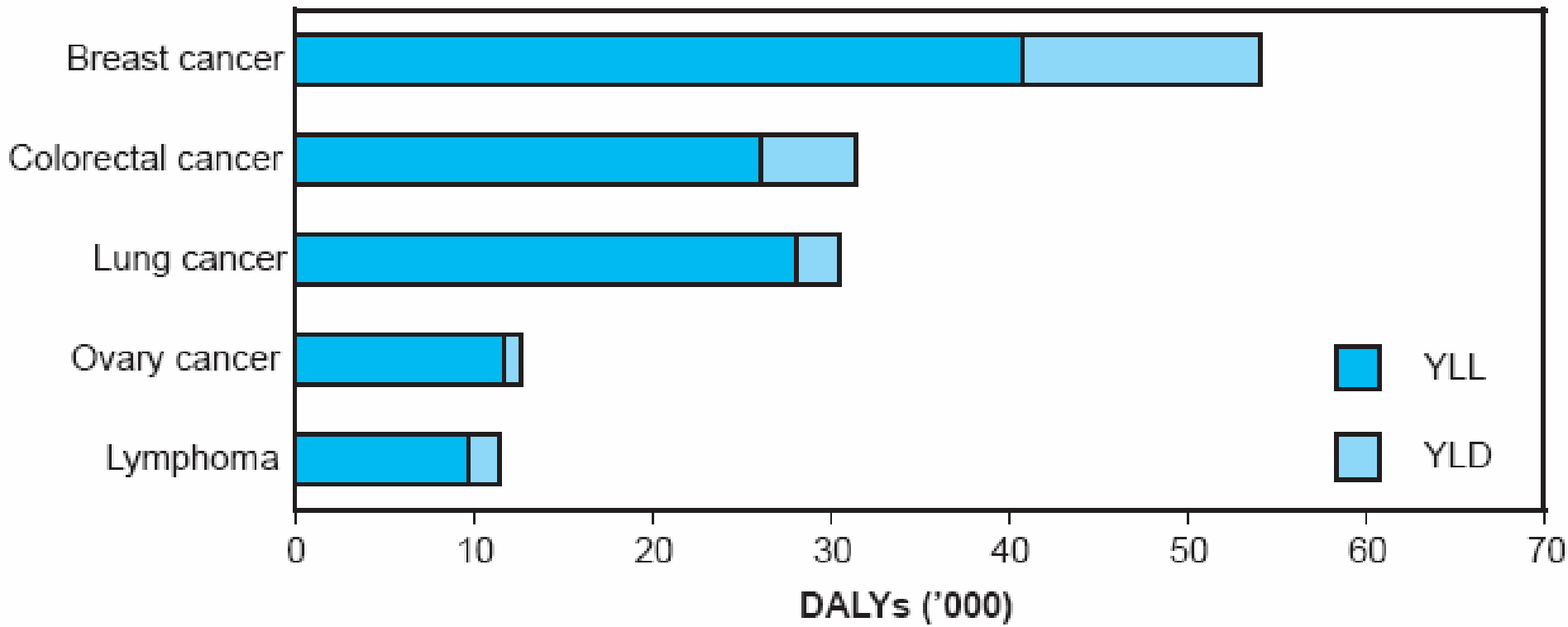
*Source: Australian Bureau of Statistics. 3303.0 Causes of Death, Australia, 2003.*accessed at http://www.abs.gov/ausstats

Years of Potential Life Lost from Cancer Australia, 2002



Source: Australian Bureau of Statistics. Australia Now, 2004: 2. Australian Social Trends, Health Cancer Trends; accessed at http://www.abs.gov/ausstats.

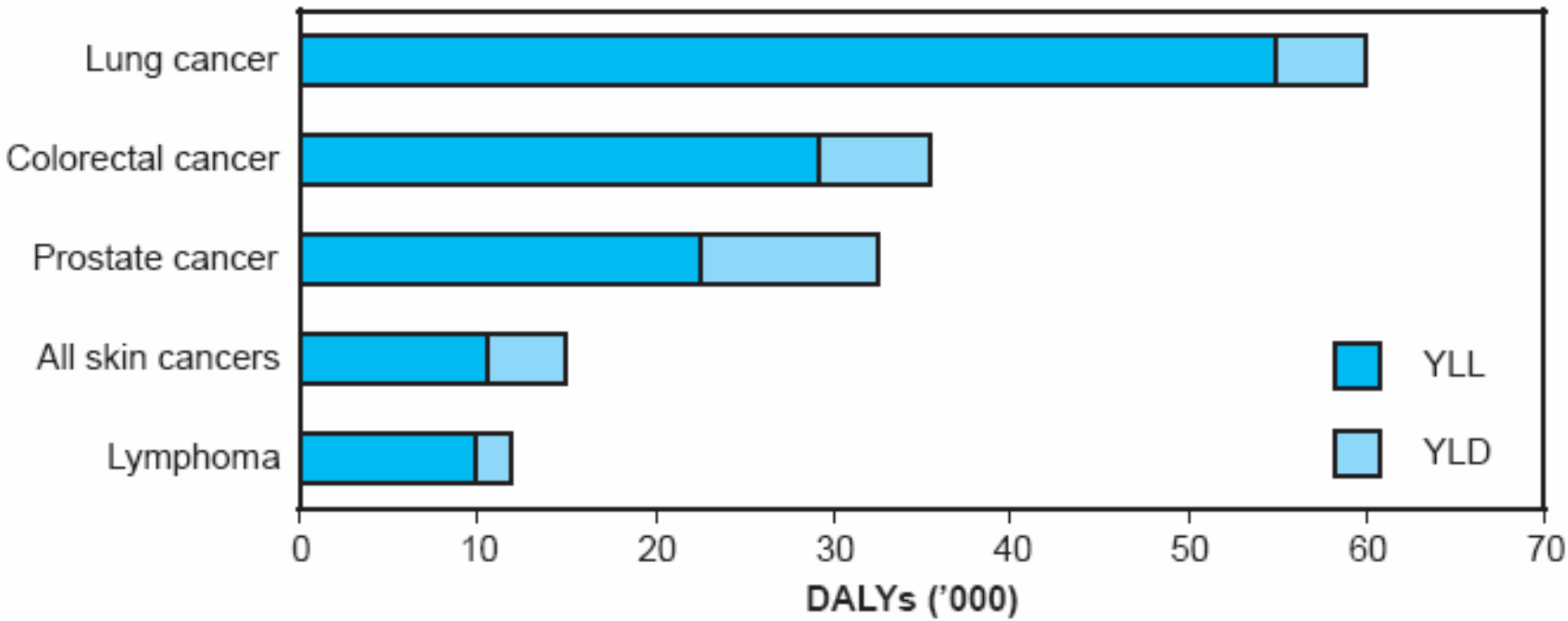
Disease Burden Associated with Cancer For Females Australia, 1996



Note: YLL is years of life lost due to premature mortality; YLD is years of 'healthy' life lost due to disability.

Source: AIHW: Mathers et al. 1999.

Disease Burden Associated with Cancer For Males Australia, 1996

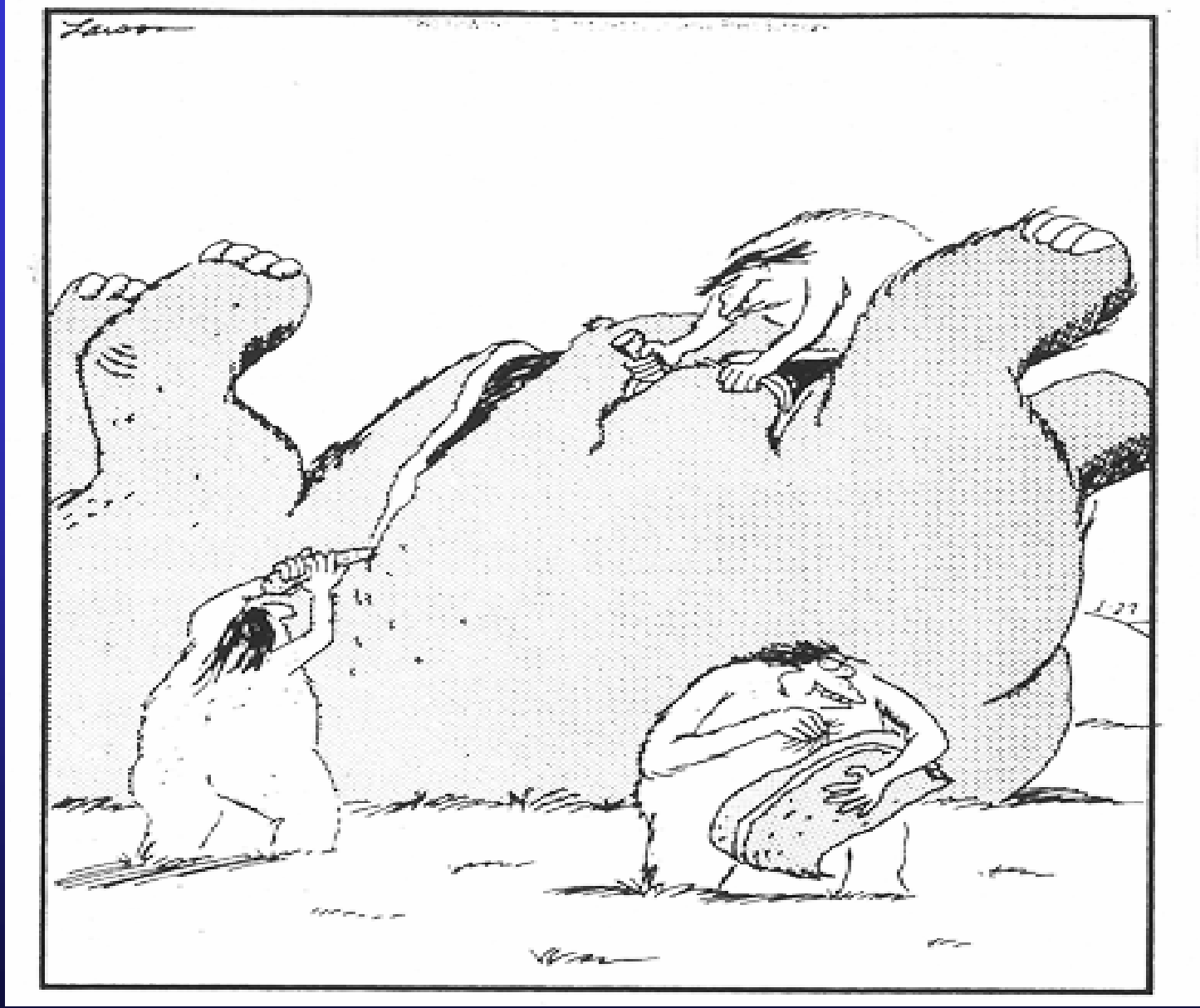


Note: YLL is years of life lost due to premature mortality; YLD is years of 'healthy' life lost due to disability.

Source: AIHW: Mathers et al. 1999.

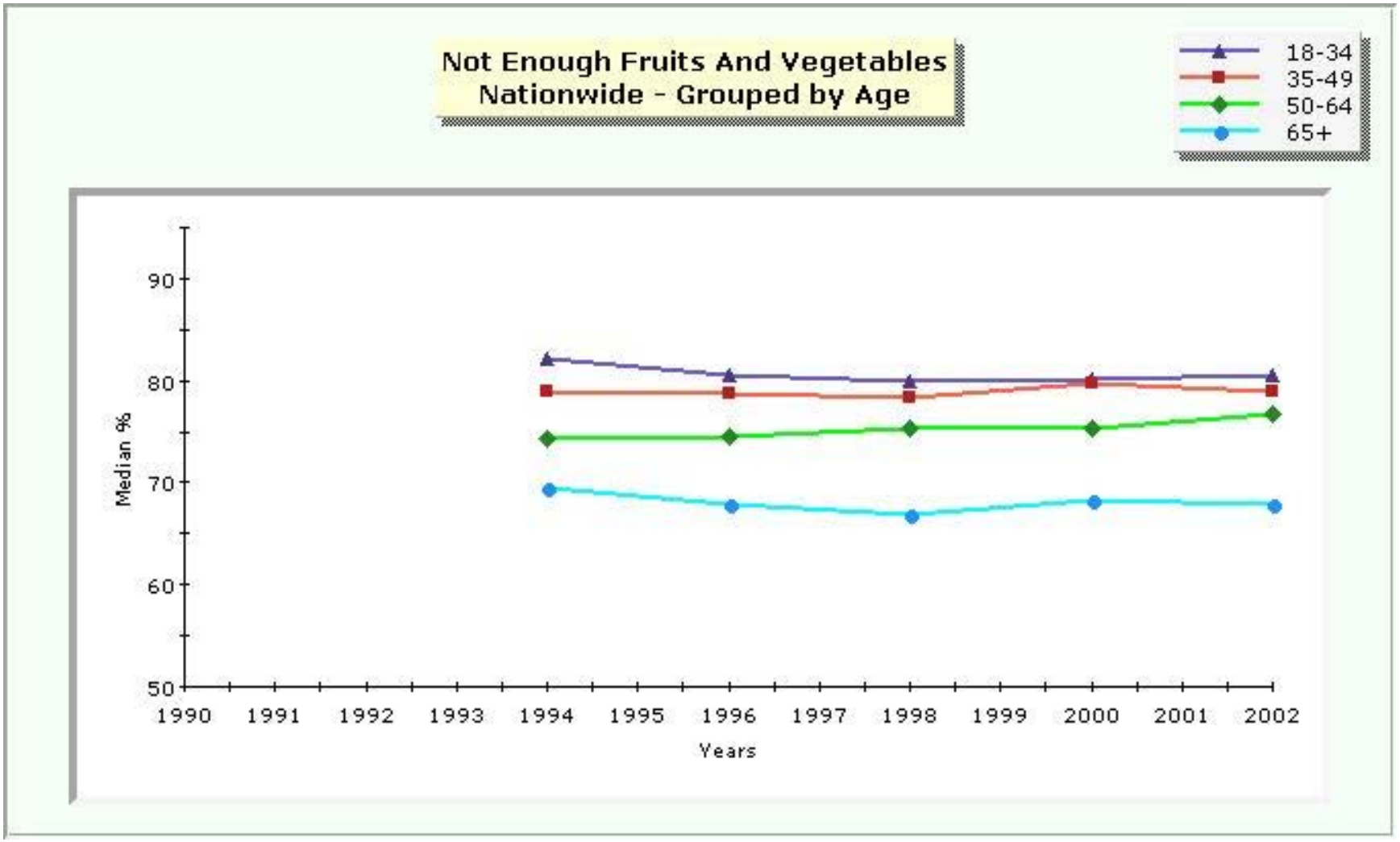

THEY'VE FINALLY MADE NUTRITION LABELS THAT EVERYONE CAN UNDERSTAND.
"EAT TOO MUCH OF THIS STUFF AND YOU'LL DIE."
DUFFY

We know that a diet higher in vegetables and fruit is associated with a reduced risk of cancer - as well as CHD



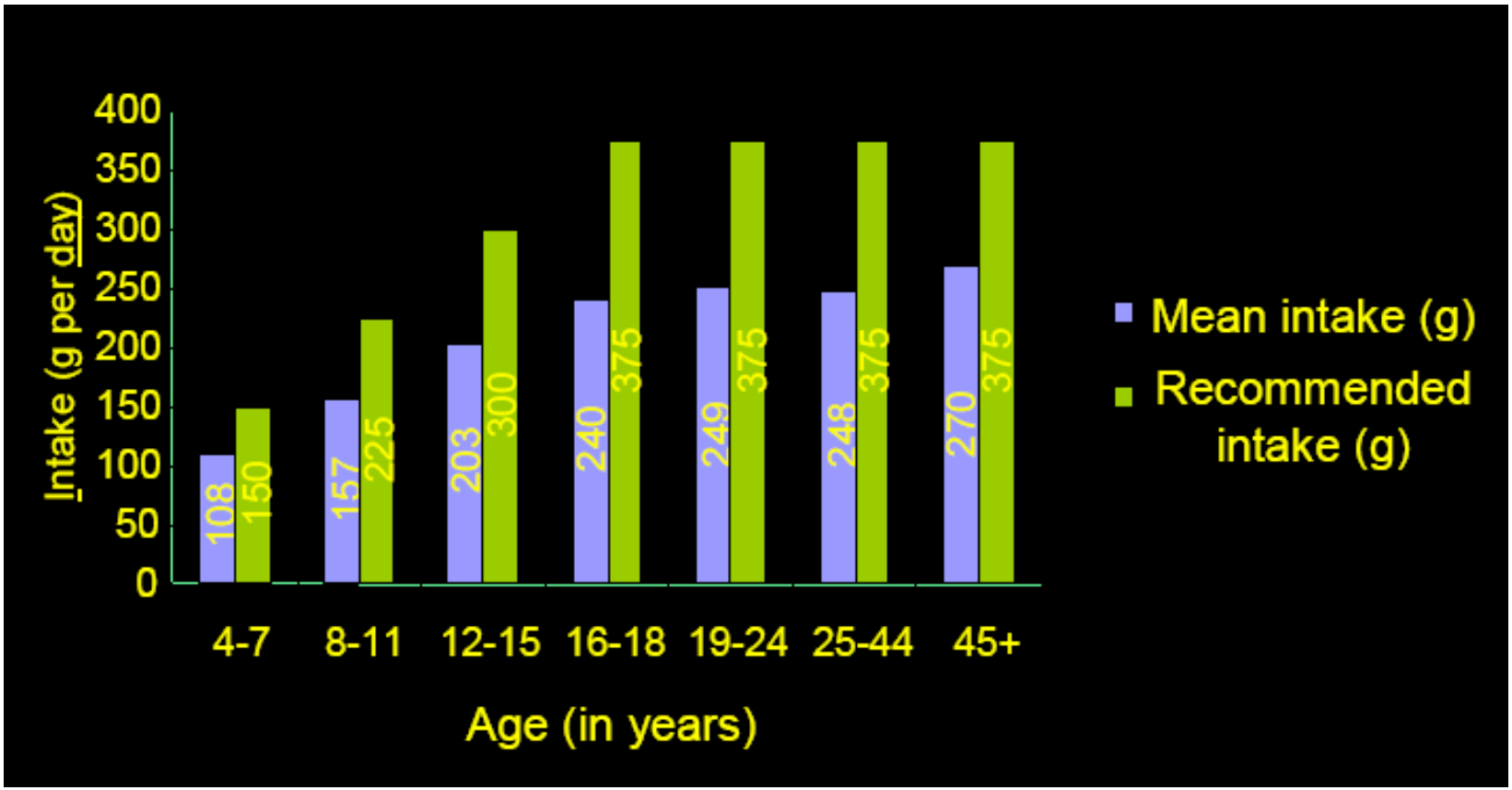
When no one was looking, Konor would secretly sprinkle on a few sprouts

Vegetable and Fruit Consumption - US



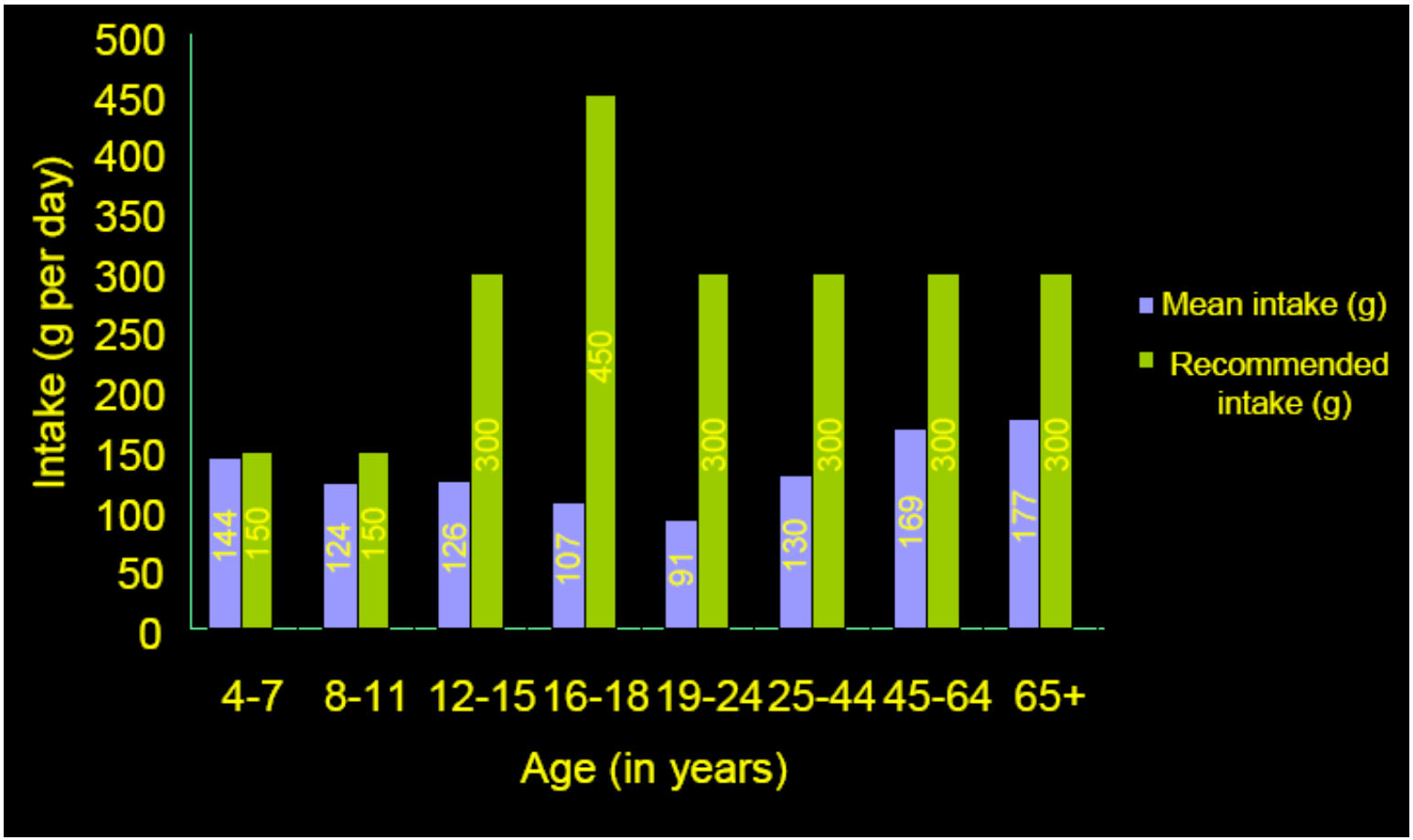
*Includes all respondents 18 and older who report they are not consuming five or more servings of fruits and vegetables a day.
**No data for nationwide - 1990, 1991, 1992, 1993, 1995, 1997, 1999, 2001
Source: Behavioral Risk Factor Surveillance System, Centers for Disease Control and Prevention, access at: http://www.cdc.gov/nccdphp/brfss/index.htm

Vegetable Intake Per Day by Age
New Zealand, 1995



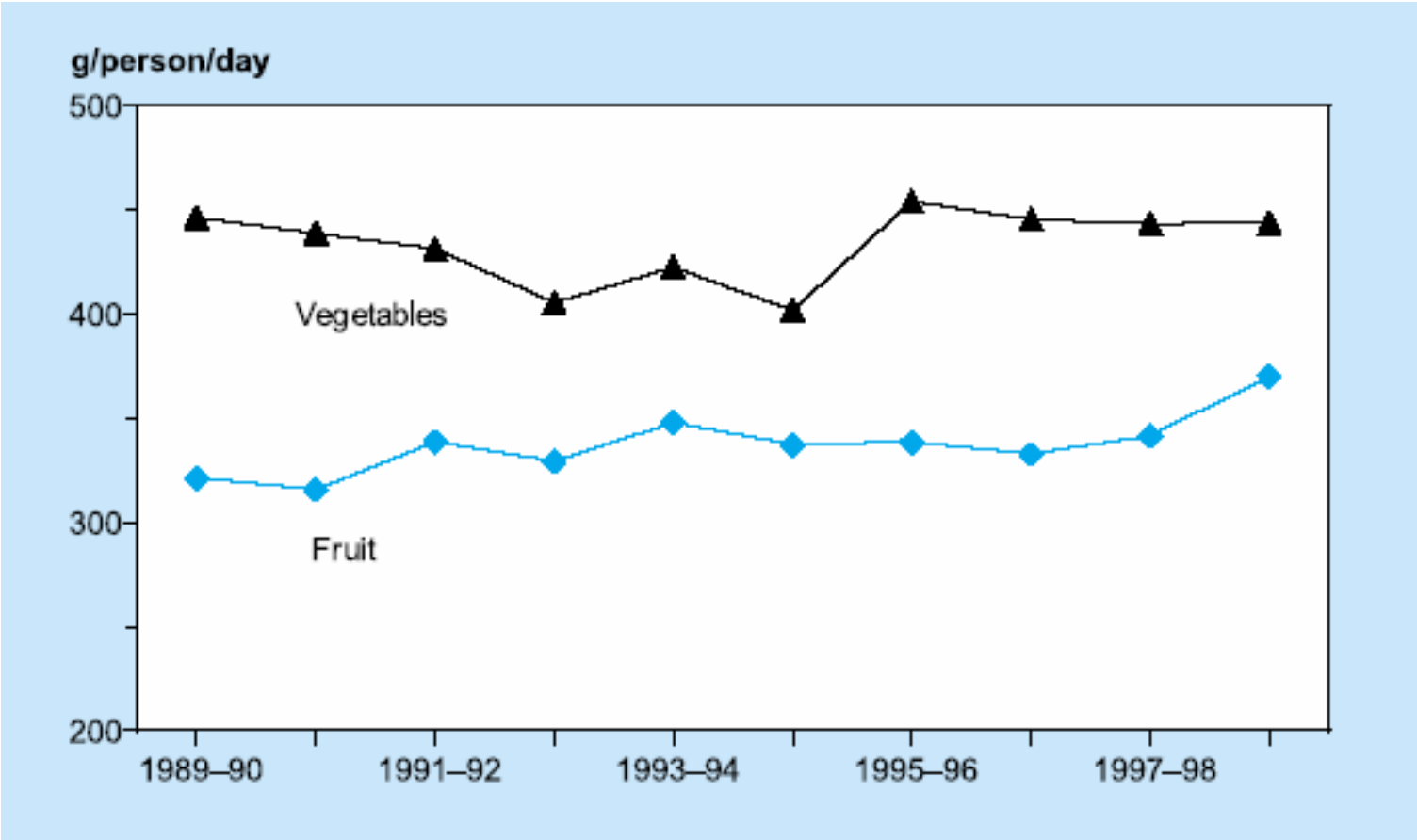
Source: Warnock, F. "Building a National Partnership …the Australian Experience." Presented at New Zealand Fruit and Vegetables in Health Seminar Series, 8-10 October 2002.

Fruit Intake Per Day by Age
New Zealand, 1995



Source: Warnock, F. "Building a National Partnership …the Australian Experience." Presented at New Zealand Fruit and Vegetables in Health Seminar Series, 8-10 October 2002.

Vegetable and Fruit Consumption Per Day Australia, 1989-1999



Note: The data given are for fresh fruit and vegetables plus the fresh equivalent weight of produce used in processing, such as canning and juice. The data include allowances for non-commercial production, such as fruit and vegetables grown at home.

Source: ABS Cat. No. 4306.0 (various years).

Transport

Food in the US travels 1300 miles and changes hands six times before being consumed

Hendrickson, USDOE, 1969

The Packer, 1992

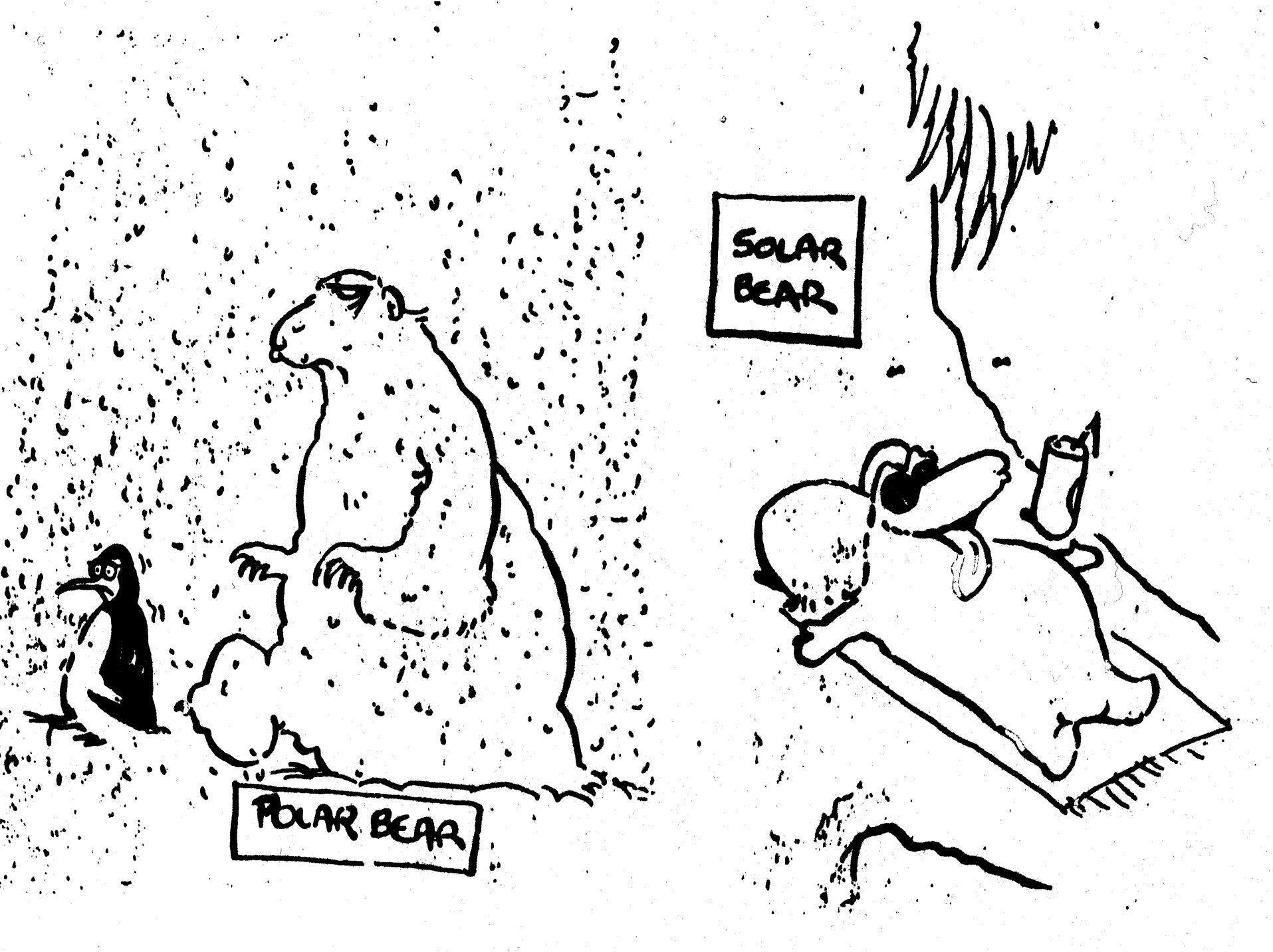
Increased durability means reduced palatability and nutritional value

Kloppenberg et al. 1996

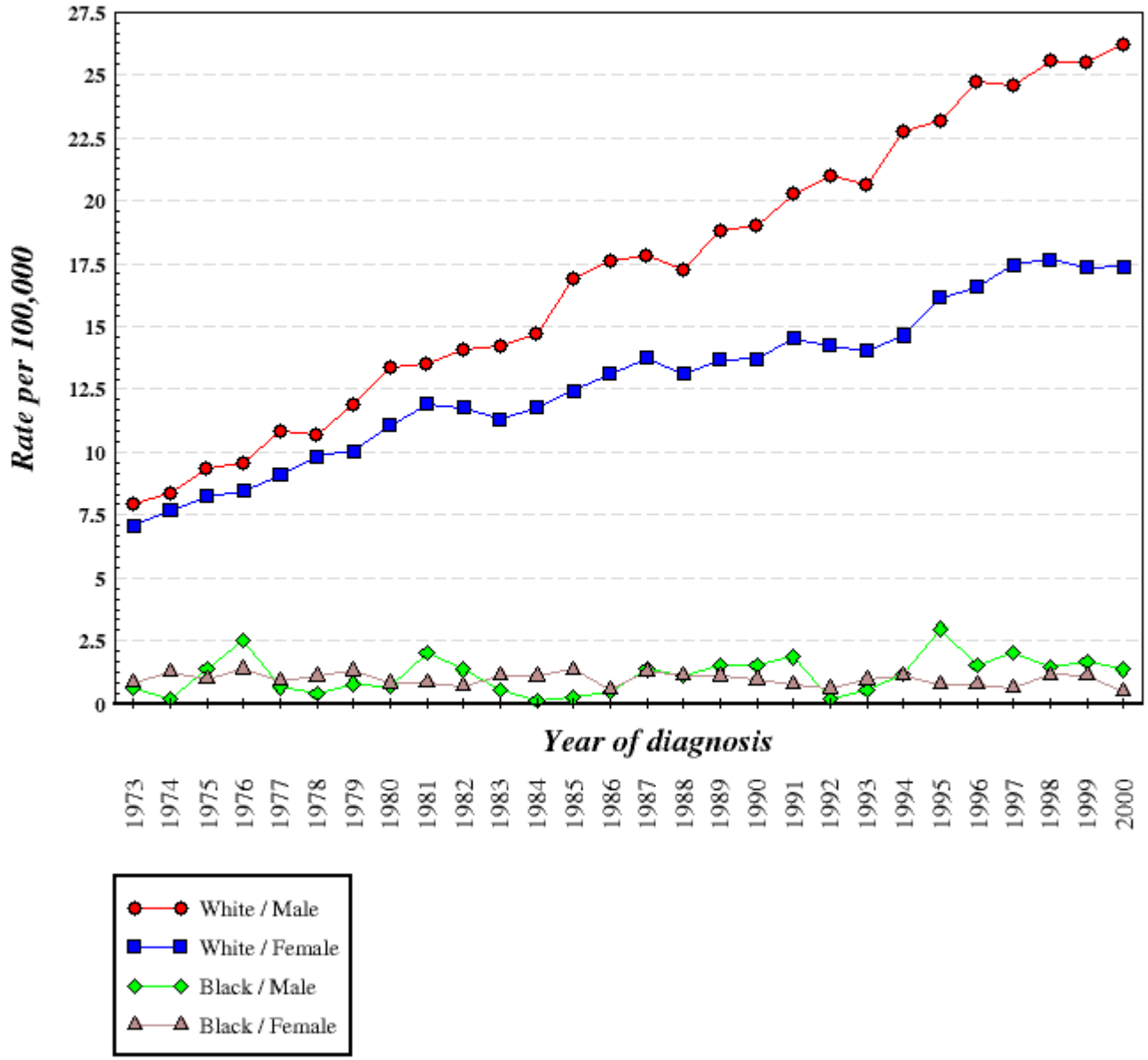
Nutrient losses are important, even with excellent storage, particularly Vitamin C, carotenoids, riboflavin, Vitamin E

Bender and Bender, 1997

We know that avoiding excessive sun exposure reduces the risk of melanoma and other skin cancers

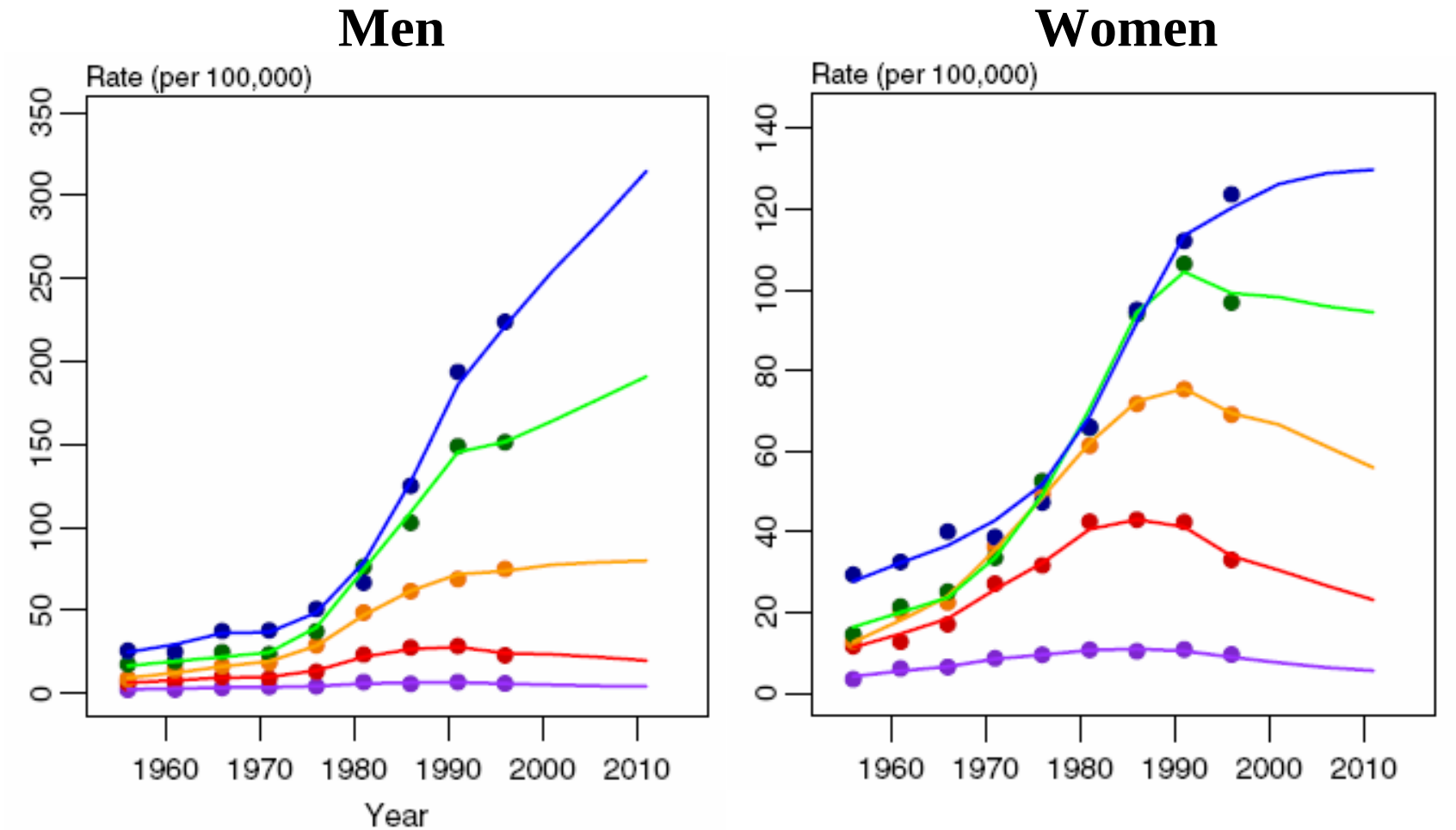

POLAR BEAR
SOLAR BEAR

Melanoma Incidence in the US, 1973-2000



Source: SEER*Stat Database: Incidence - SEER 9 Regs Public-Use, Nov 2002 Sub (1973-2000).

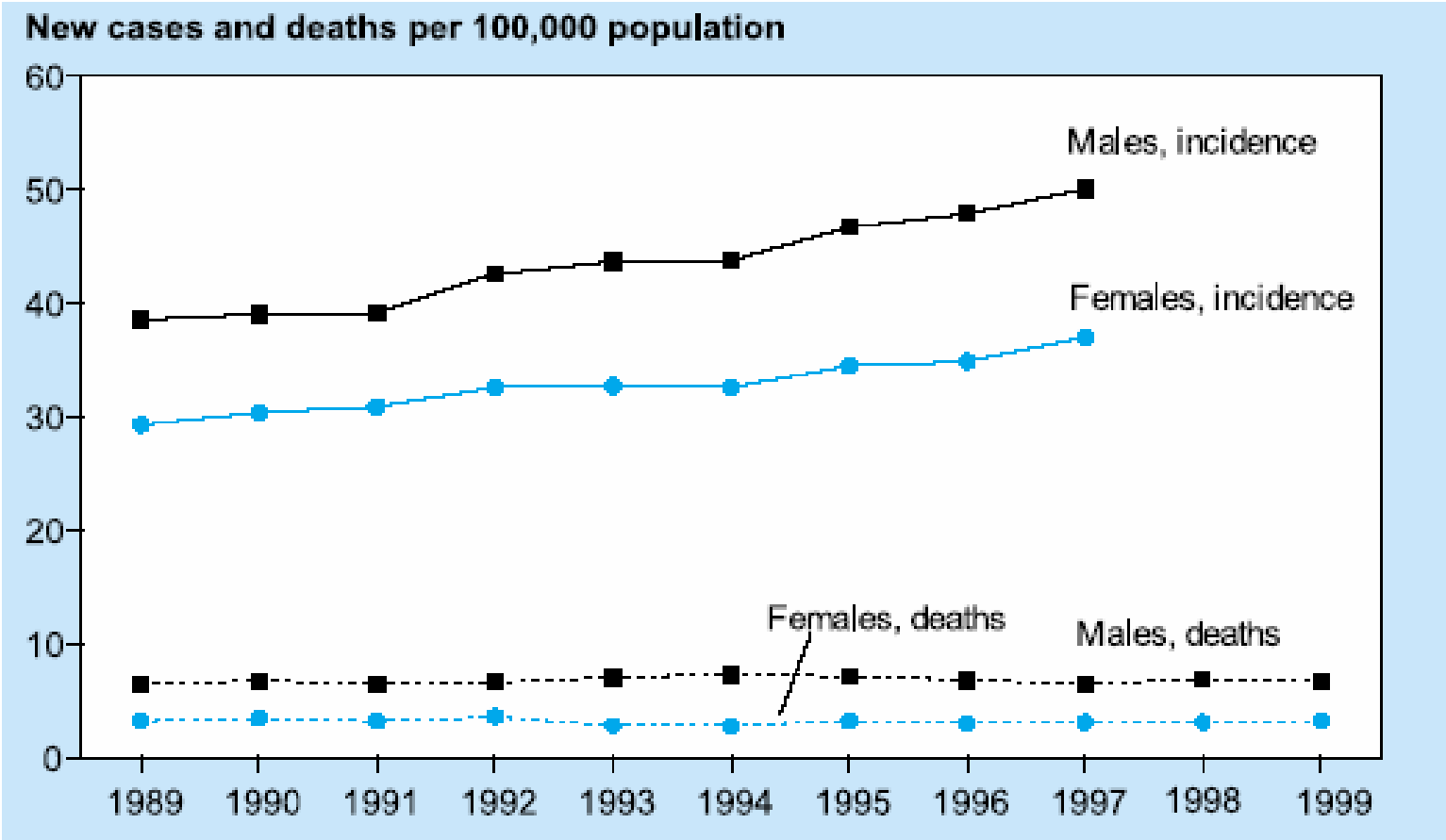
Trends and Predictions for Melanoma Incidence Rates, New Zealand



Key: 15-24 year olds; 25-44 year olds; 45-64 year olds; 65-74 year olds; 75 years & older

Source: New Zealand Ministry of Health. *Cancer in New Zealand: Trends and Projections*, 2002.

Incidence and Death Rates for Melanoma Australia, 1989-1999



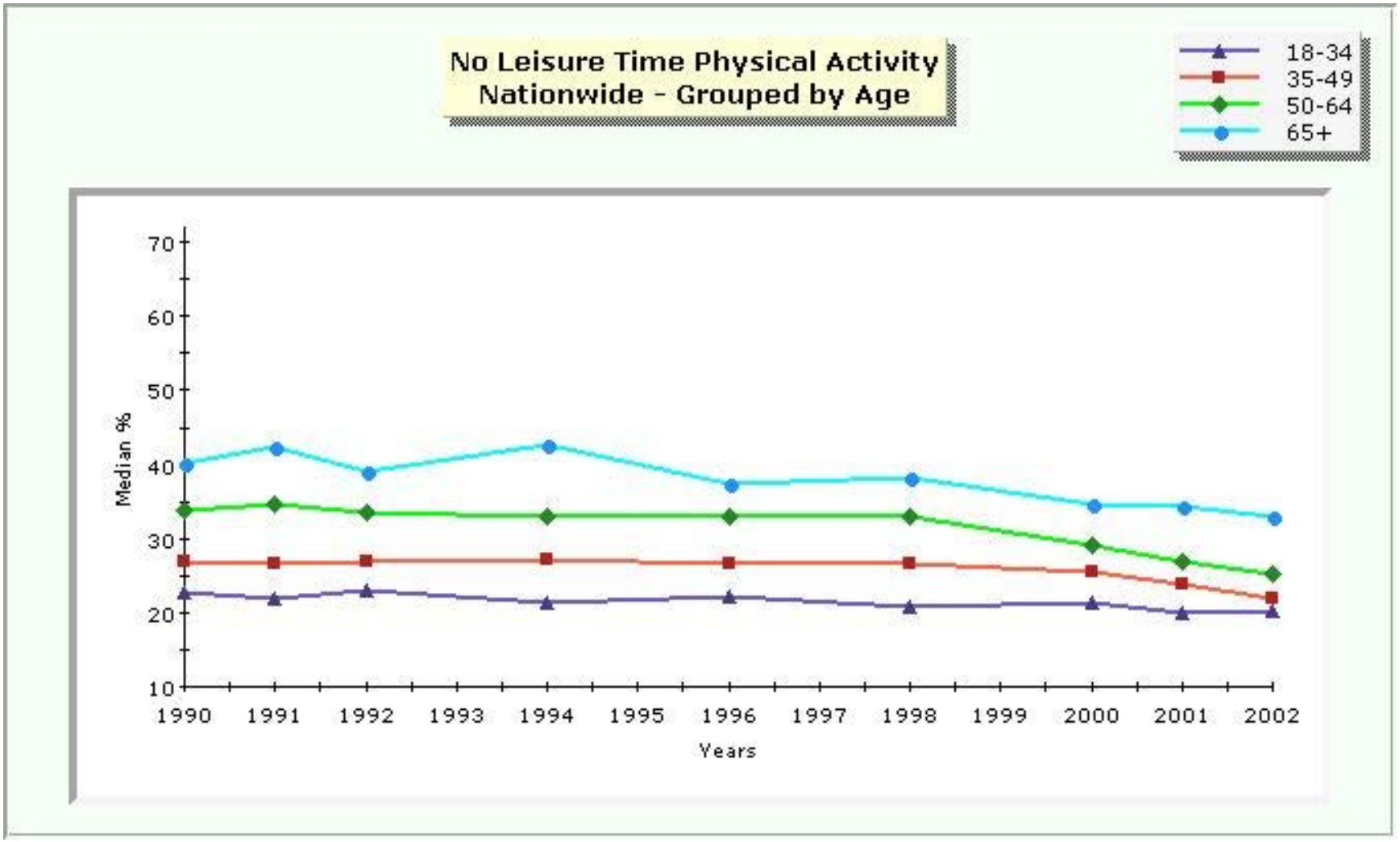
Notes

1. Melanoma is classified according to the ICD-10 code: C43.
2. The incidence and death rates were age-adjusted using the total Australian population as at 30 June 1991.

Sources: AIHW National Cancer Statistics Clearing House Database and State and Territory cancer registries.

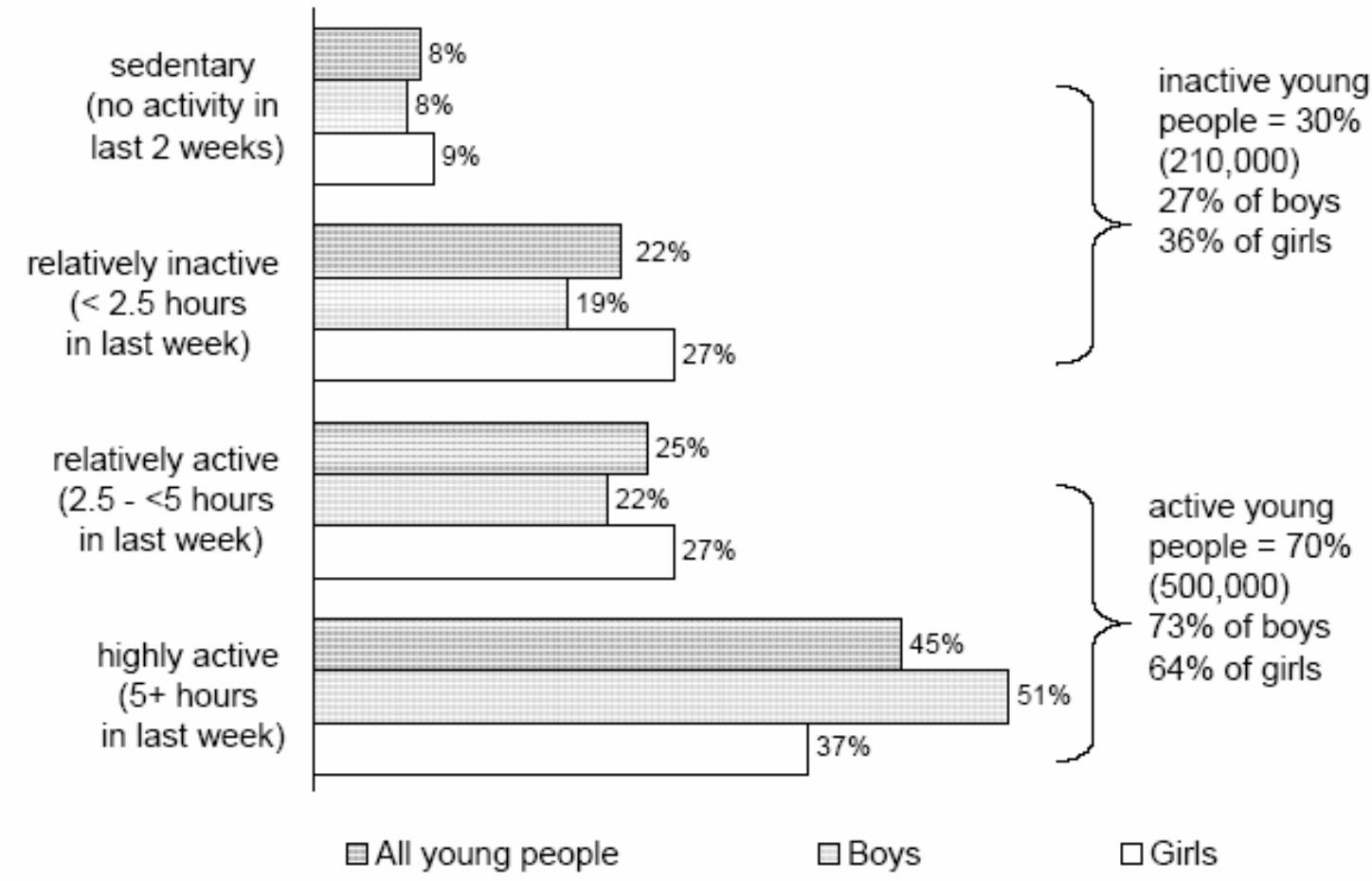
We know that physical activity reduces risk of several cancers, particularly colon cancer, as well as obesity and heart disease

Lack of Participation in Physical Activity, USA



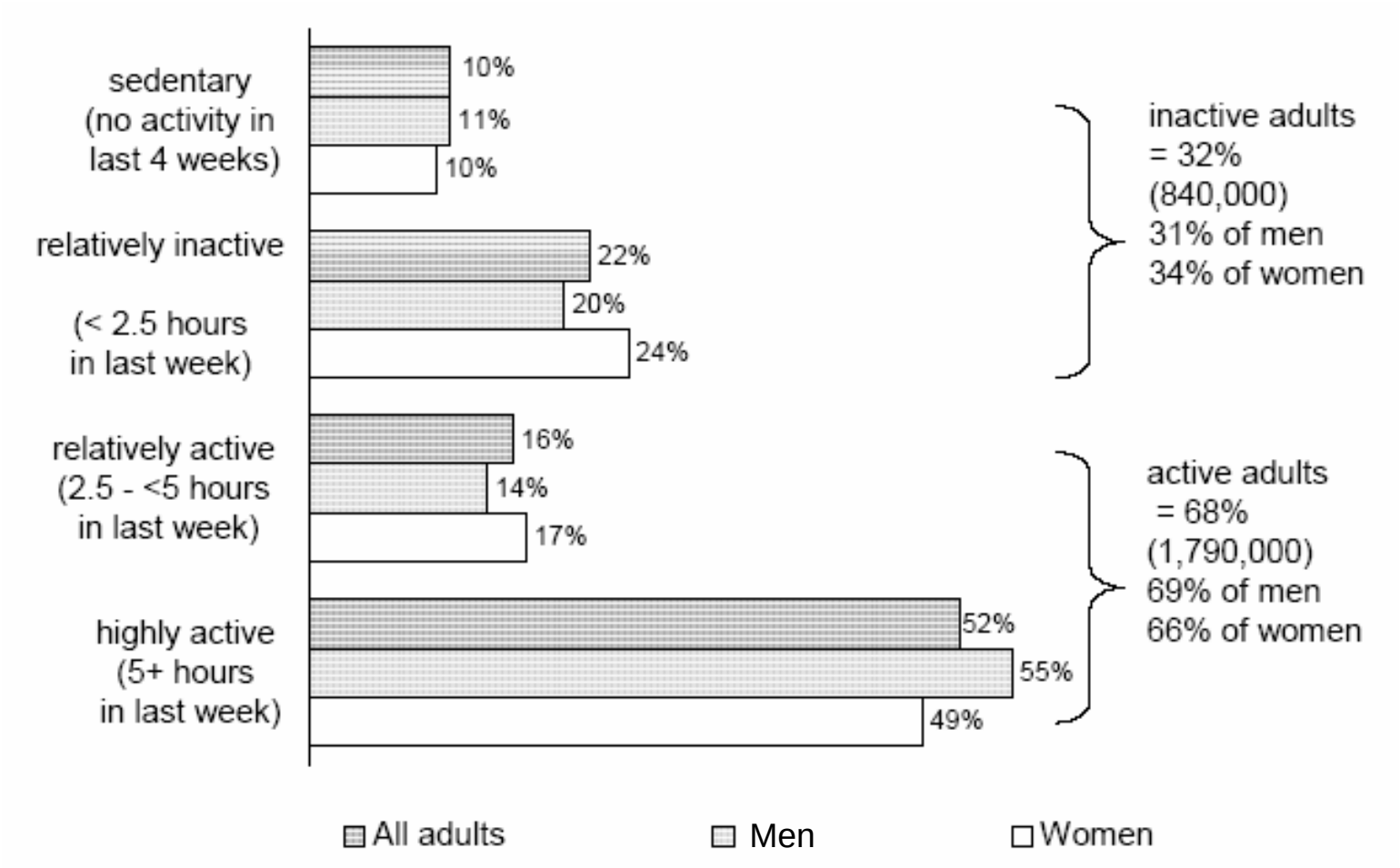
*Includes all respondents 18 and older who report no leisure-time physical activity during the past month.
**No data for nationwide - 1993, 1995, 1997, 1999
Source: Behavioral Risk Factor Surveillance System, Centers for Disease Control and Prevention, access at: http://www.cdc.gov/nccdphp/brfss/index.htm

Level of Physical Activity among Young People in New Zealand, 1997-2000



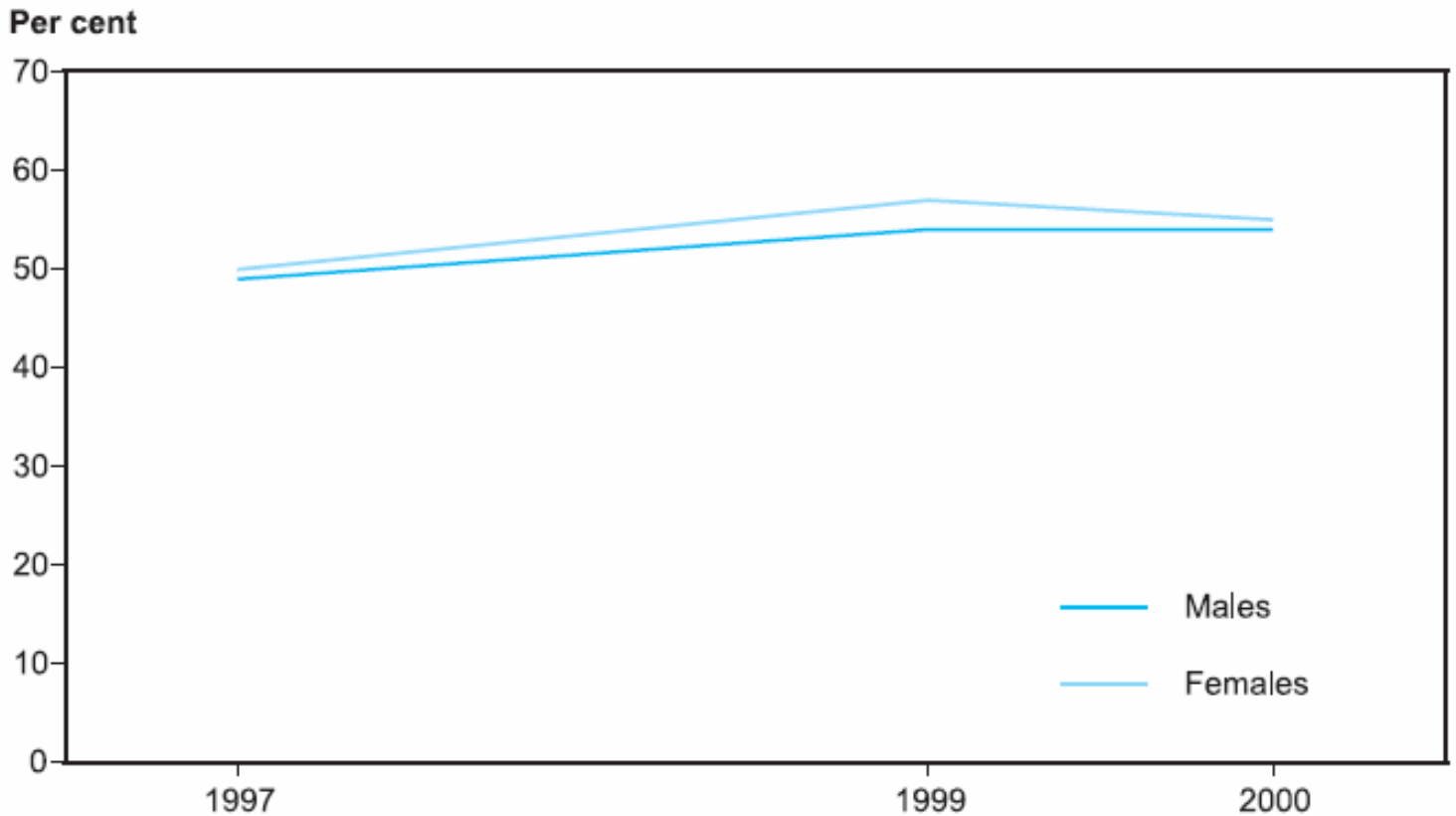
Note: Young people refers to persons age 5-17 years old.
Source: SPARC Facts/Push Play Facts (1997/99). Accessed at: http://www.sparc.org.nz/research/sparcfacts_2.php

Level of Physical Activity among Adults New Zealand, 1997-2000



Note: Adults refers to persons age 18 years and older.
Source: SPARC Facts/Push Play Facts (1997/99). Accessed at: http://www.sparc.org.nz/research/sparcfacts_2.php

Proportion of Adults with Insufficient or No Physical Activity, Australia 1997, 1999, 2000



Notes

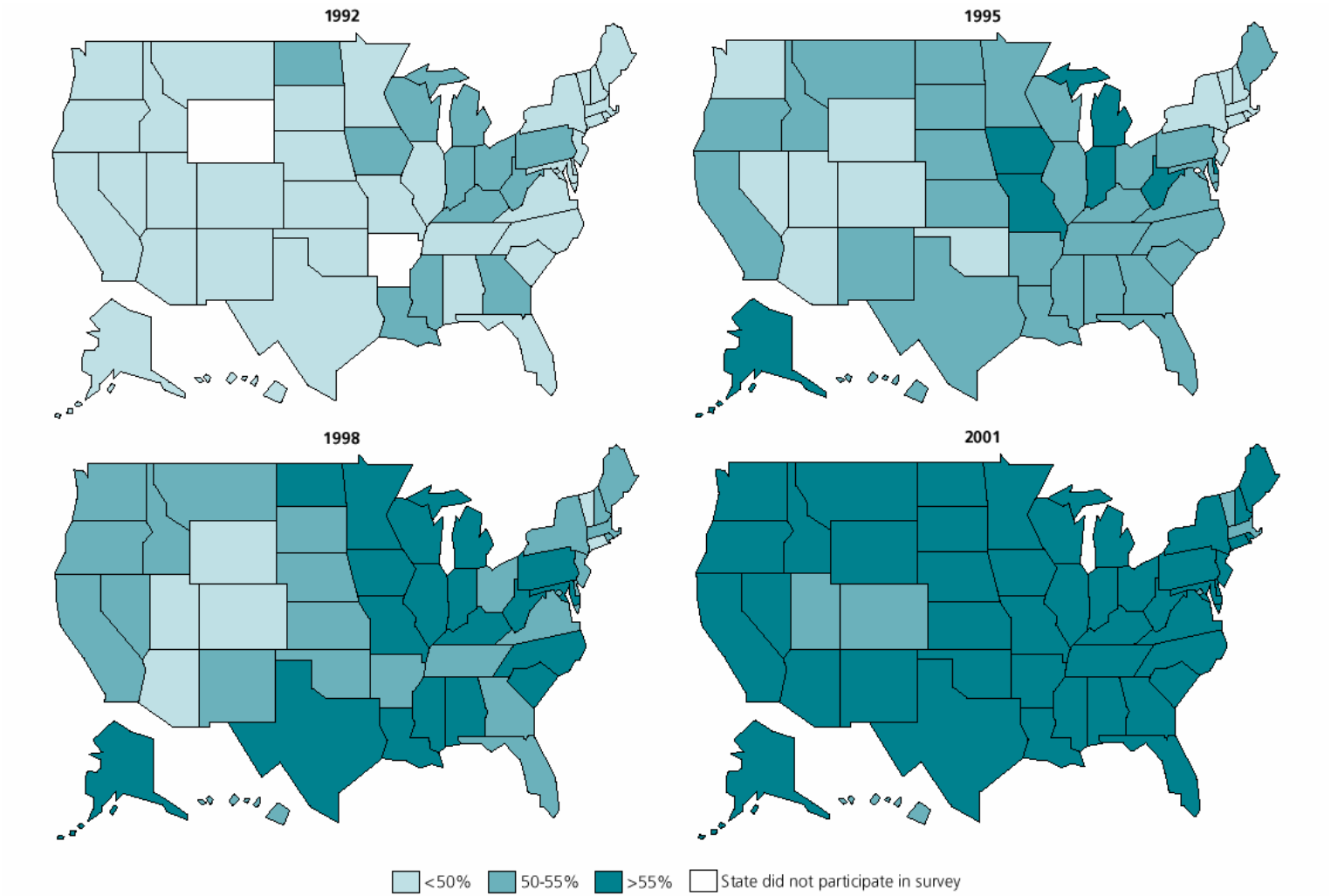
1. Age-standardised to the 2001 Australian population.
2. People aged 18–75 years.
3. 'Insufficient physical activity' is less than 150 minutes or less than five sessions of physical activity in the previous week.

Source: AIHW analysis of the 1997, 1999, 2000 National Physical Activity surveys.

In primitive times, lack of food gave languishing bodies to death; now, on the other hand, it is abundance that buries them

Lucretius: De Rerum Natura V., 1097: (50BC)

Trends in Overweight* Prevalence (%), Adults 18 and Older, US, 1992-2001

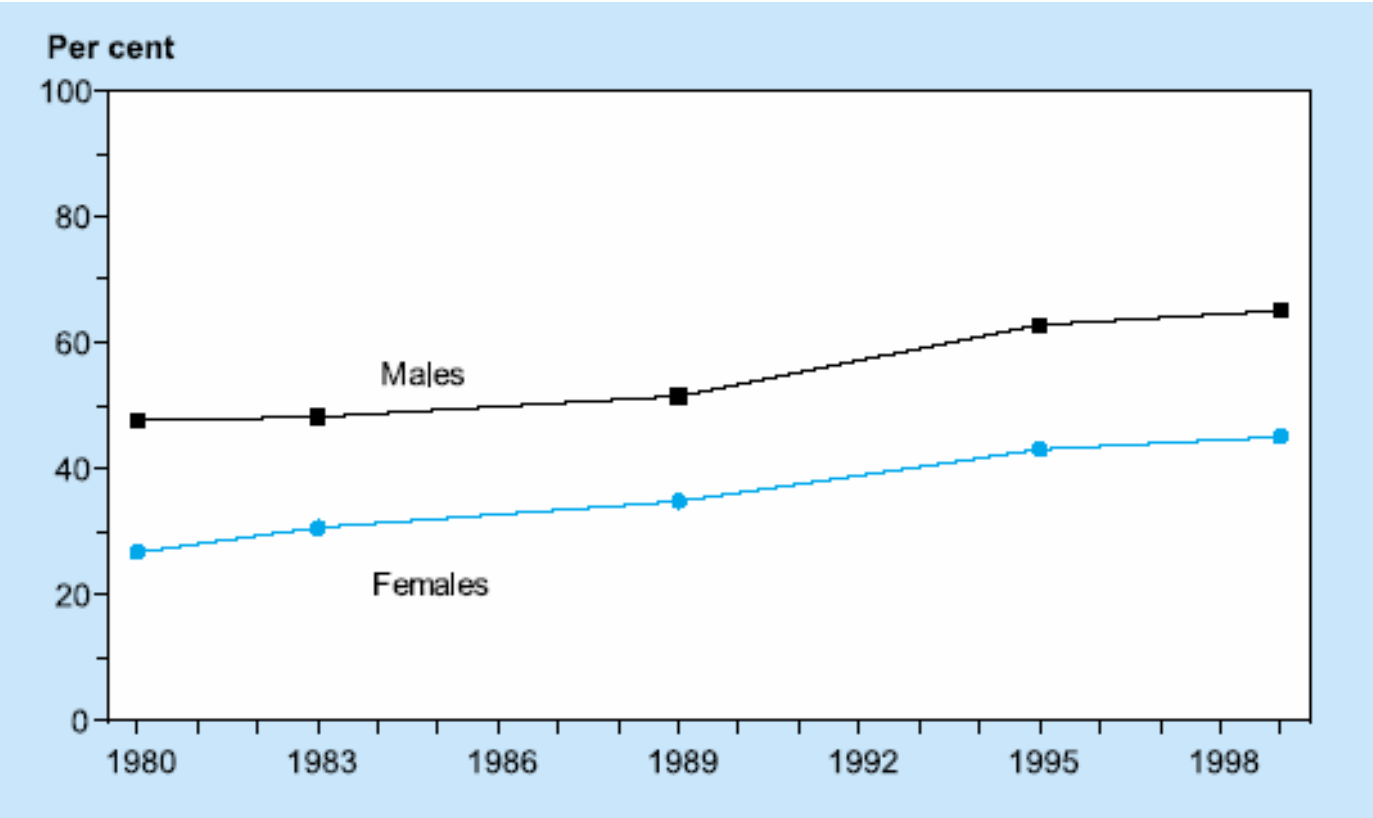


*Body mass index of 25.0 kg/m² or greater.

Source: Behavioral Risk Factor Surveillance System, CD-ROM (1984-1995, 1998) and Public Use Data Tape (2001), National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, 1997, 2000, 2002.

American Cancer Society, Surveillance Research

Proportion of 25-64 year-olds who are considered overweight, Australia, 1980-1999



Notes

1. Persons were classified overweight if they had a body mass index (BMI) ≥ 25; BMI is calculated as weight/height^2.
2. Includes only persons living in capital cities or urban areas.
3. The proportions were age-adjusted using the total Australian population as at 30 June 1991.

Sources: AIHW analysis of the 1980, 1983, 1989 NHF Risk Factor Prevalence Study surveys; 1995 ABS National Nutrition Survey; 1999–00 Australian Diabetes, Obesity and Lifestyle Study (AusDiab).

Physical Activity in Adults, USA

- Approximately **15% of U.S. adults** engage regularly (3 times a week for at least 20 minutes) in **vigorous physical activity** during leisure time
- Approximately **22%** of adults engage regularly (5 times a week for at least 30 minutes) in sustained **physical activity of any intensity** during leisure time
- About **25%** of adults report **no physical activity** in their leisure time
- Physical inactivity is more prevalent among women, among Blacks and Hispanics, among older adults, and among the less affluent

Physical Activity in Adults, New Zealand

- Between 10 and 15% of adults are sedentary
- The highest levels of physical activity are among those aged 15-24 years (65%) and those aged 65-74 years (68%)
- Maori women are as active as Maori men (68% active).
- A lower level of education was associated with lower participation in physical activity. Those who had no educational qualifications were more likely to be sedentary than those with school and post-school qualifications

Physical Activity in Adults, Australia

- About 1/3rd of Australians are at increased risk due to their sedentary lifestyle. Physical inactivity is more prevalent among older persons, those belonging to lower socio-economic groups, and persons from non-English speaking backgrounds.
- Data from the 1999 National Physical Activity Survey indicate that 60% of males and 54% of females exercise at a 'sufficient' level, i.e. they obtain some of the health benefits attributed to physical activity.

Physical Activity in Adolescents & Young Adults, USA

- Only about 50% of U.S. young people (ages 12-21 years) regularly participate in vigorous physical activity
- 25% report no vigorous physical activity
- About 14% of young people report no recent vigorous or light to moderate physical activity. This indicator of inactivity is higher among females and particularly among African-American females
- Participation in all types of physical activity declines strikingly as age or grade in school increases

Physical Activity in Children & Adolescents, New Zealand

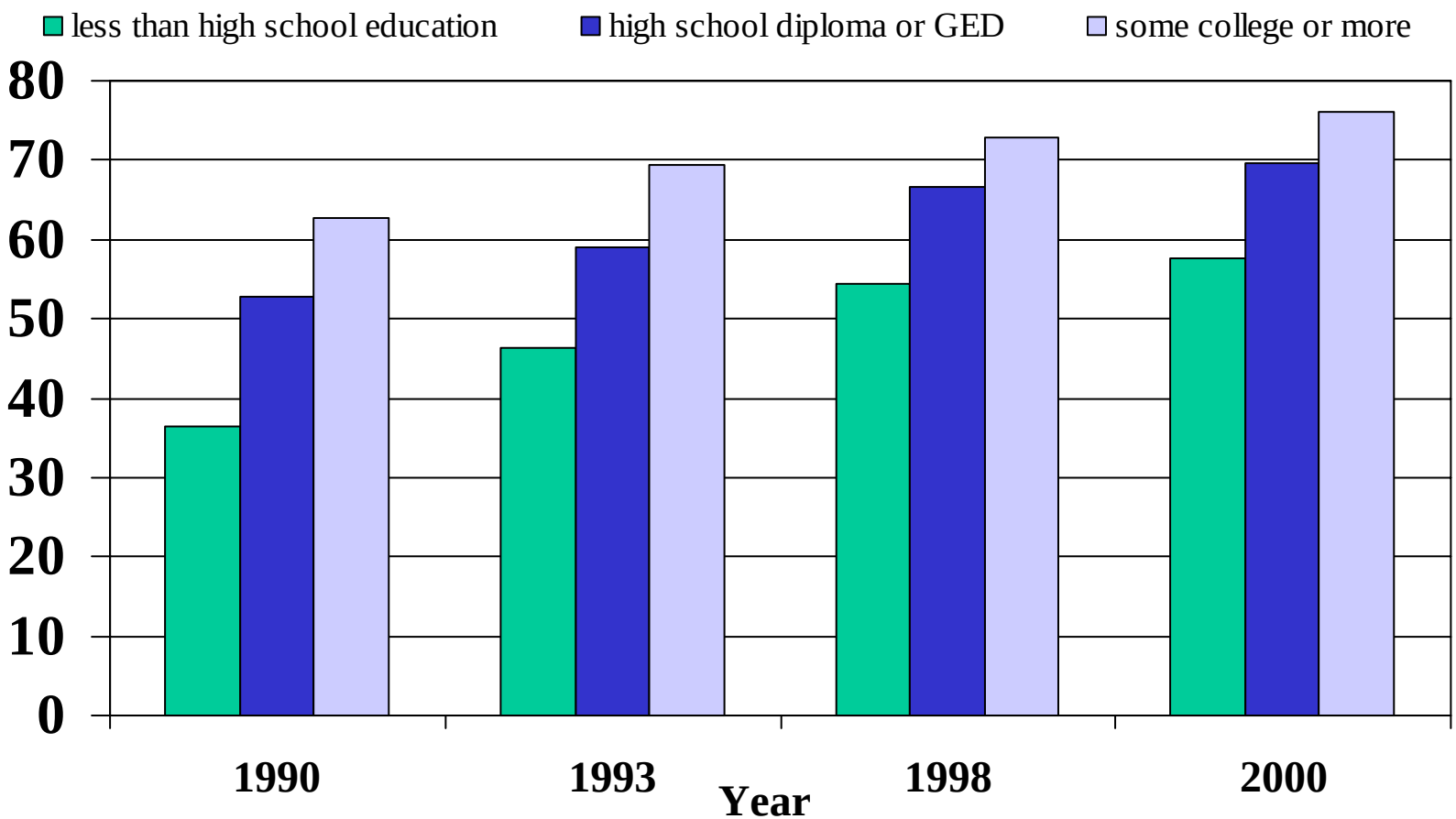
- **66%** of young people are active (2.5 hours physical activity per week)

- Almost all young people (**92%**) take part in some **sport or physical activity** (but not necessarily more than 2.5 hours per week). Participation is high for both boys (93%) and girls (91%).

We know that screening and early detection reduce markedly the risk of dying from cancer

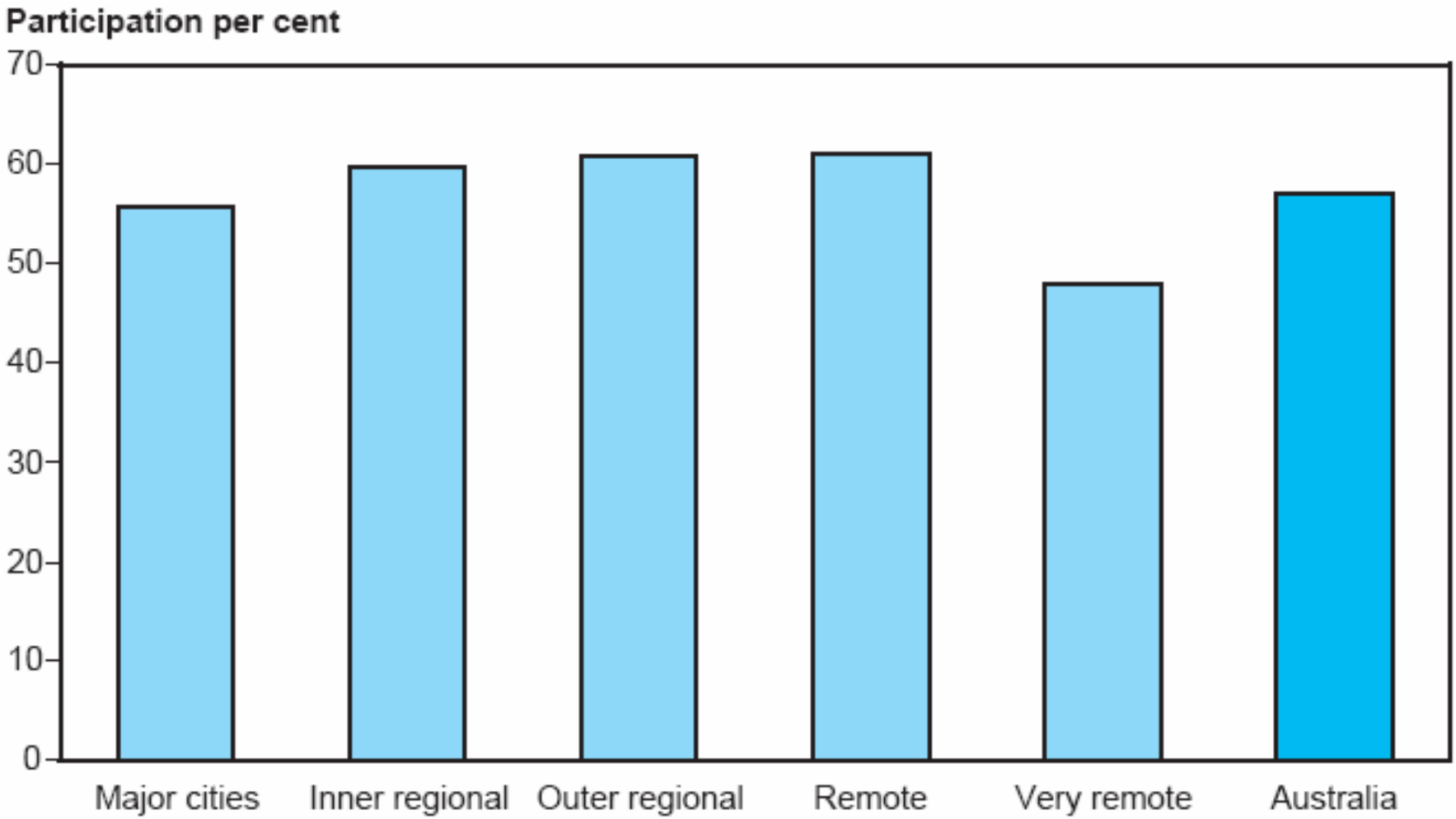
Mammography and Education, US - 1990-2000

Percentage of women 40 years of age and older who report having a mammogram within the past 2 years



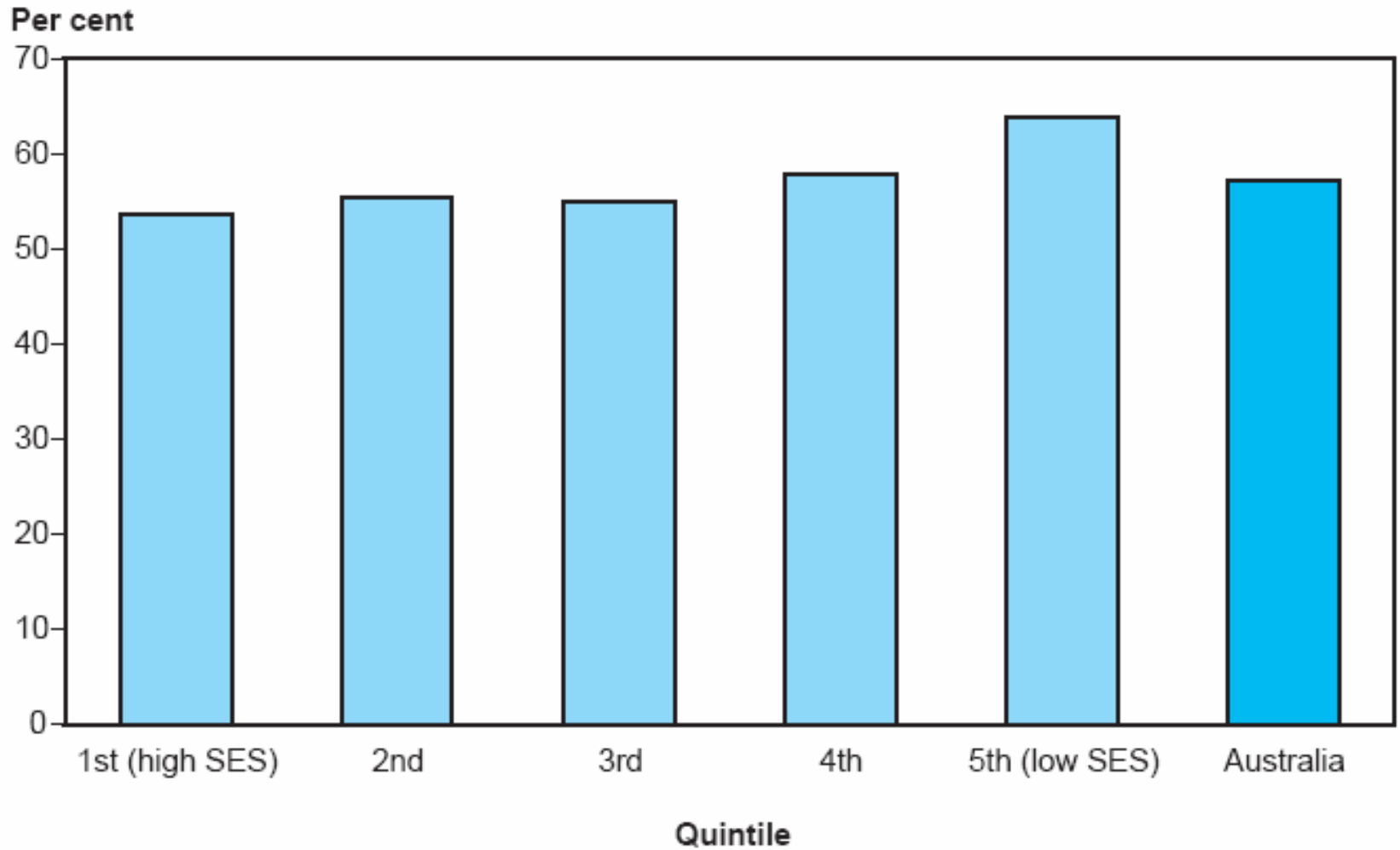
Source: Centers for Disease Control and Prevention, *Health, United States, 2003*, access at: http://www.cdc.gov/nchs/hus.htm.

Participation by Women Aged 50-69 Years in BreastScreen Australia by region, 2001-02



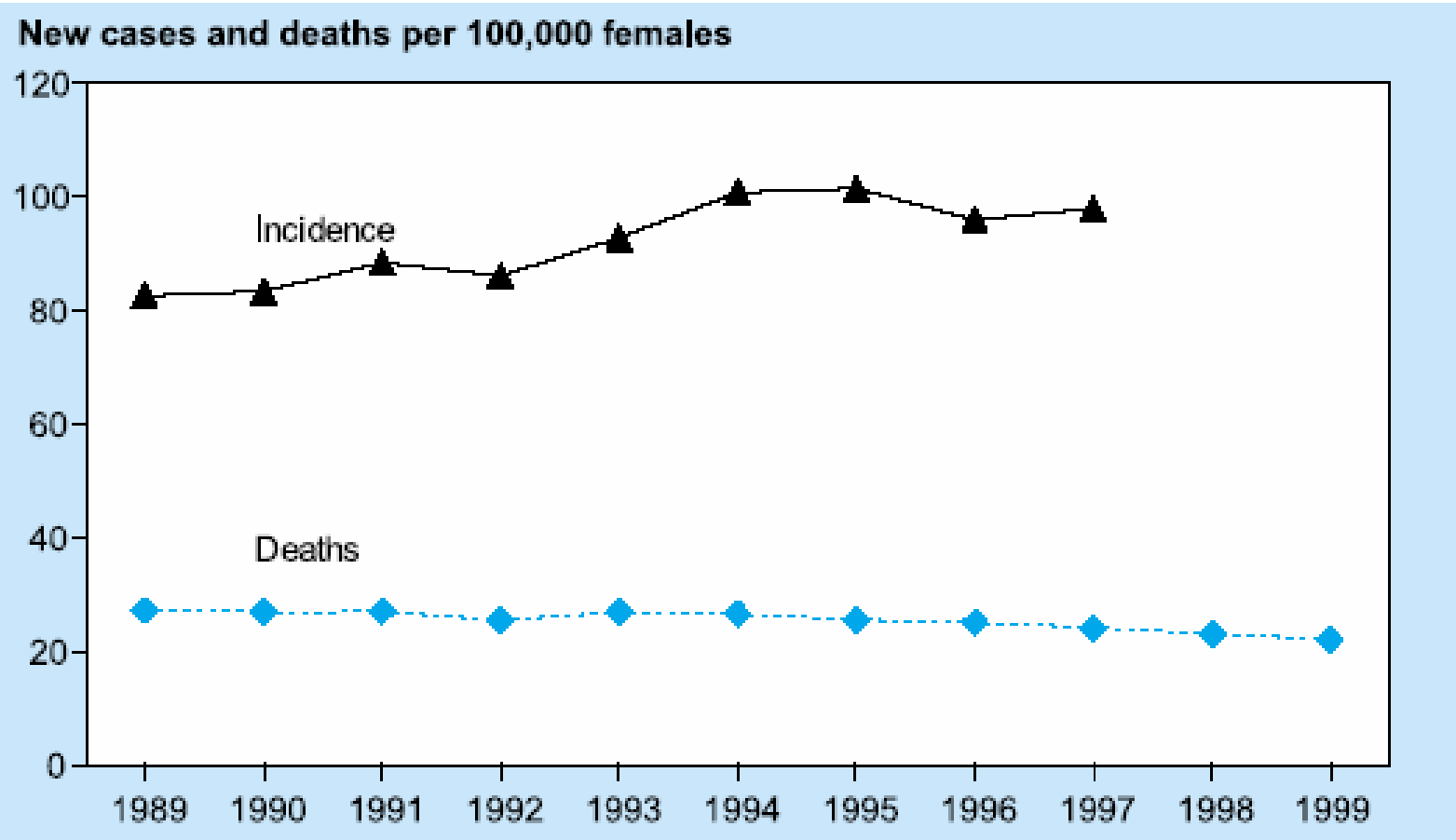
Source: AIHW analysis of BreastScreen Australia data.

Participation by Women Aged 50-69 Years in BreastScreen Australia by socio-economic status, 2001-02



Source: AIHW analysis of BreastScreen Australia data.

Incidence and Death Rates for Breast Cancer Australia, 1989-1999

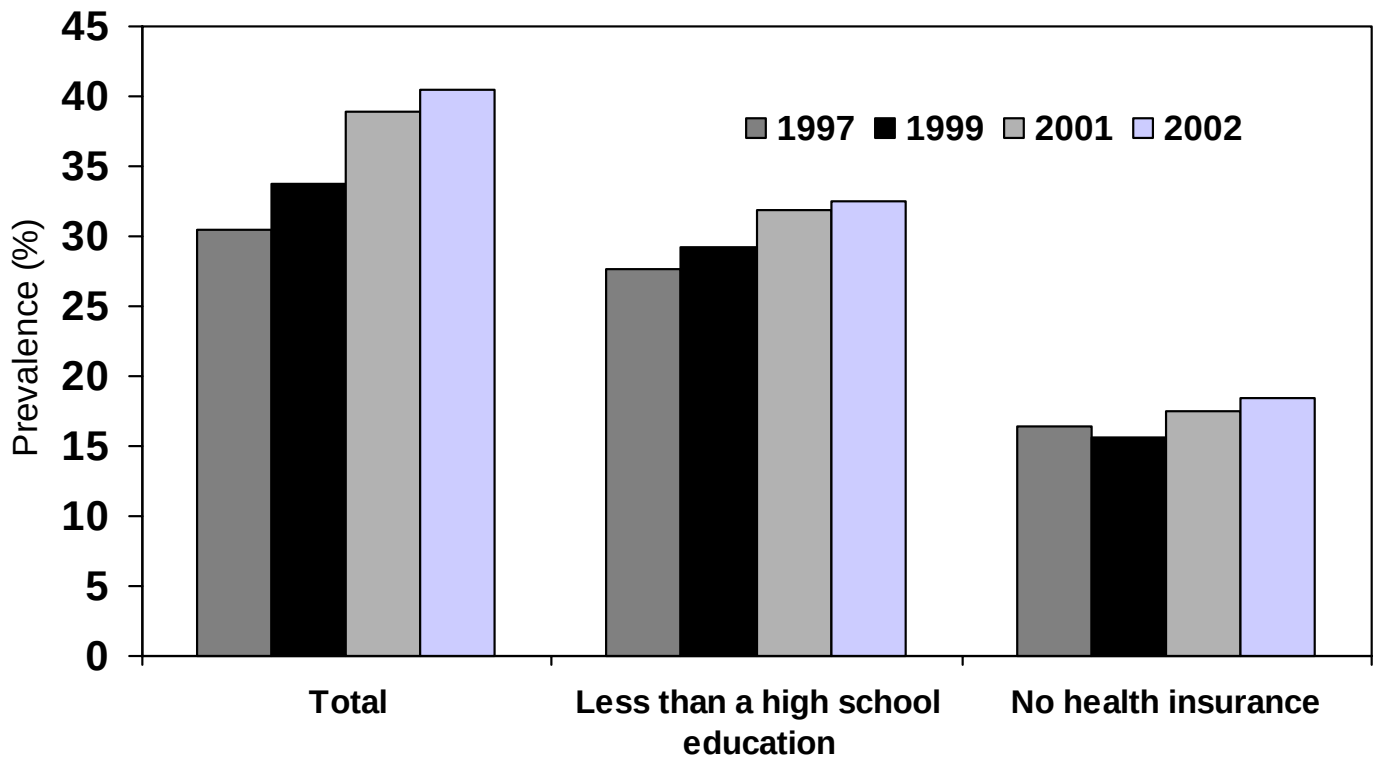


Notes
1. Breast cancer is classified according to the ICD-10 code: C50.
2. The incidence and death rates were age-adjusted using the total Australian population as at 30 June 1991.

Sources: AIHW National Cancer Statistics Clearing House Database and State and Territory cancer registries.

Flexible Sigmoidoscope

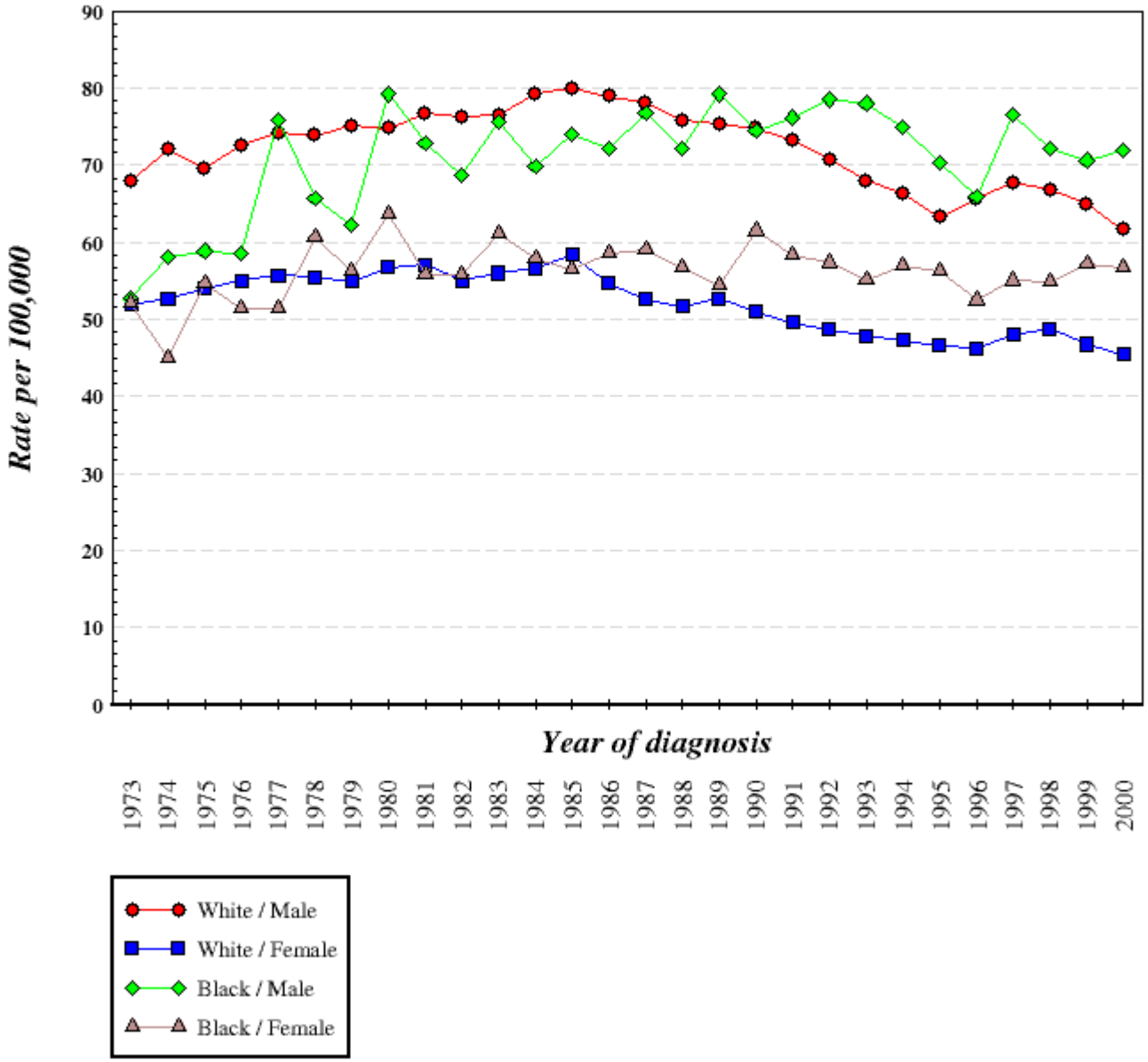
Recent Flexible Sigmoidoscopy Prevalence Among Adults 50 Years and Older, US, 1997-2002



*A flexible sigmoidoscopy or colonoscopy within the past five years. Note: Data from participating states and the District of Columbia were aggregated to represent the United States.

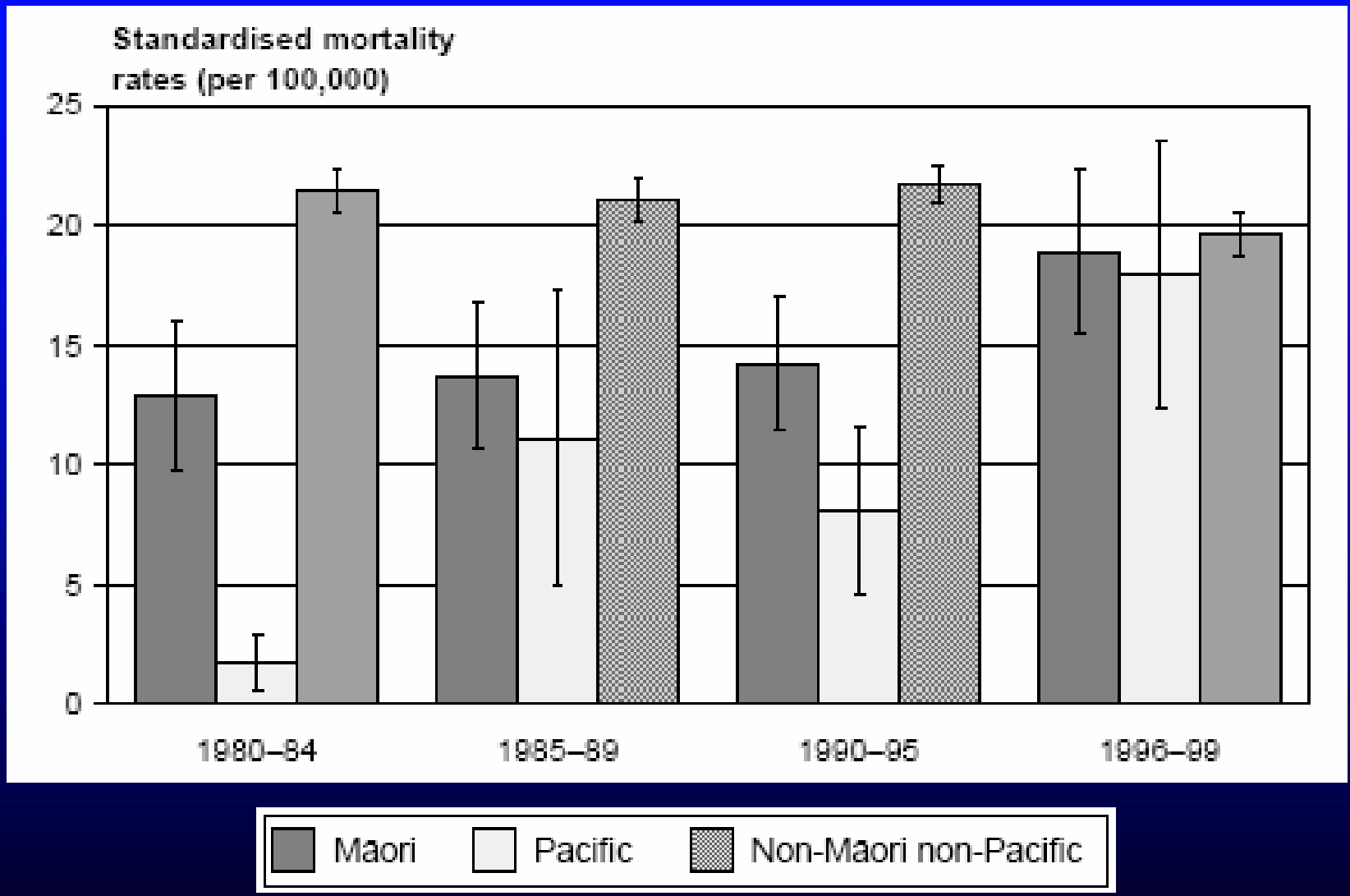
Source: Behavioral Risk Factor Surveillance System CD-ROM (1996-1997, 1999) and Public Use Data Tape (2001, 2002), National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention and Prevention, 1999, 2000, 2002, 2003.

Colorectal Cancer Incidence 1973-2000



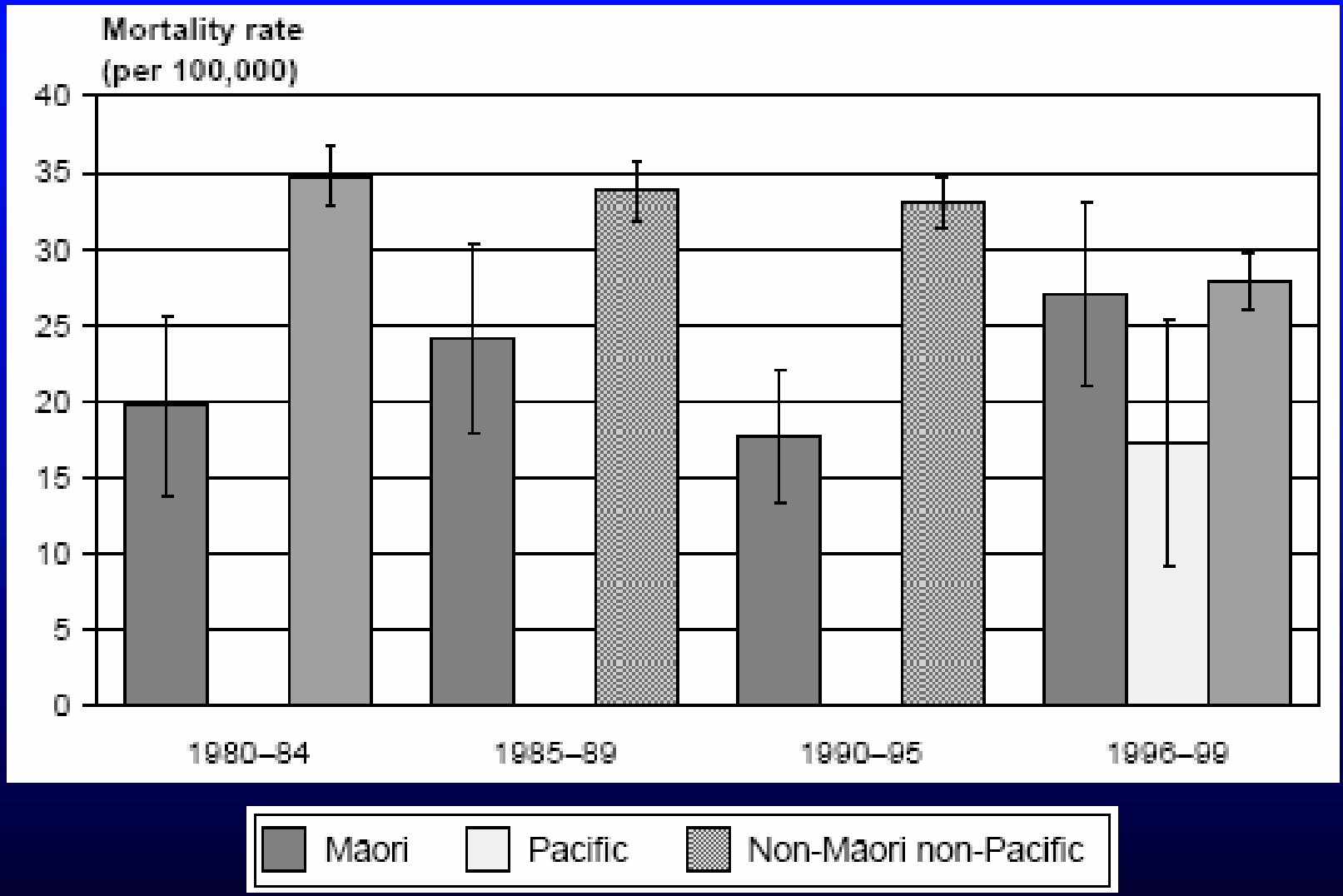
Source: SEER Cancer Statistics Review, 1975-2000, (NCI 2003)

Colorectal Cancer: Males New Zealand, 1980-1999



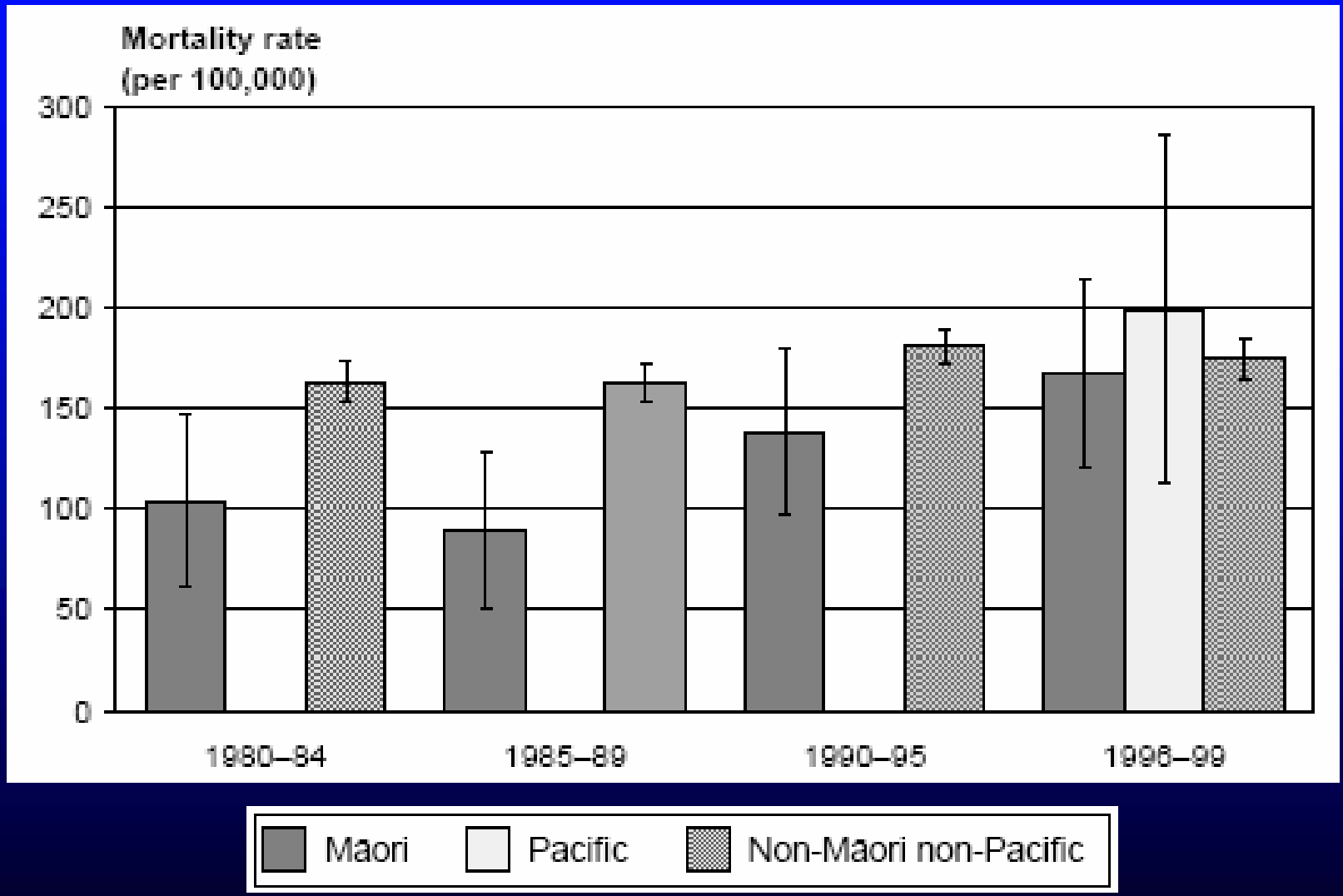
Source: Ajwani S, Blakely T, Robson B, Tobias M, Bonne M. 2003. *Decades of Disparity: Ethnic mortality trends in New Zealand 1980-1999*. Wellington: Ministry of Health and University of Otago.

Colorectal Cancer: Males 35-64 years old New Zealand, 1980-1999



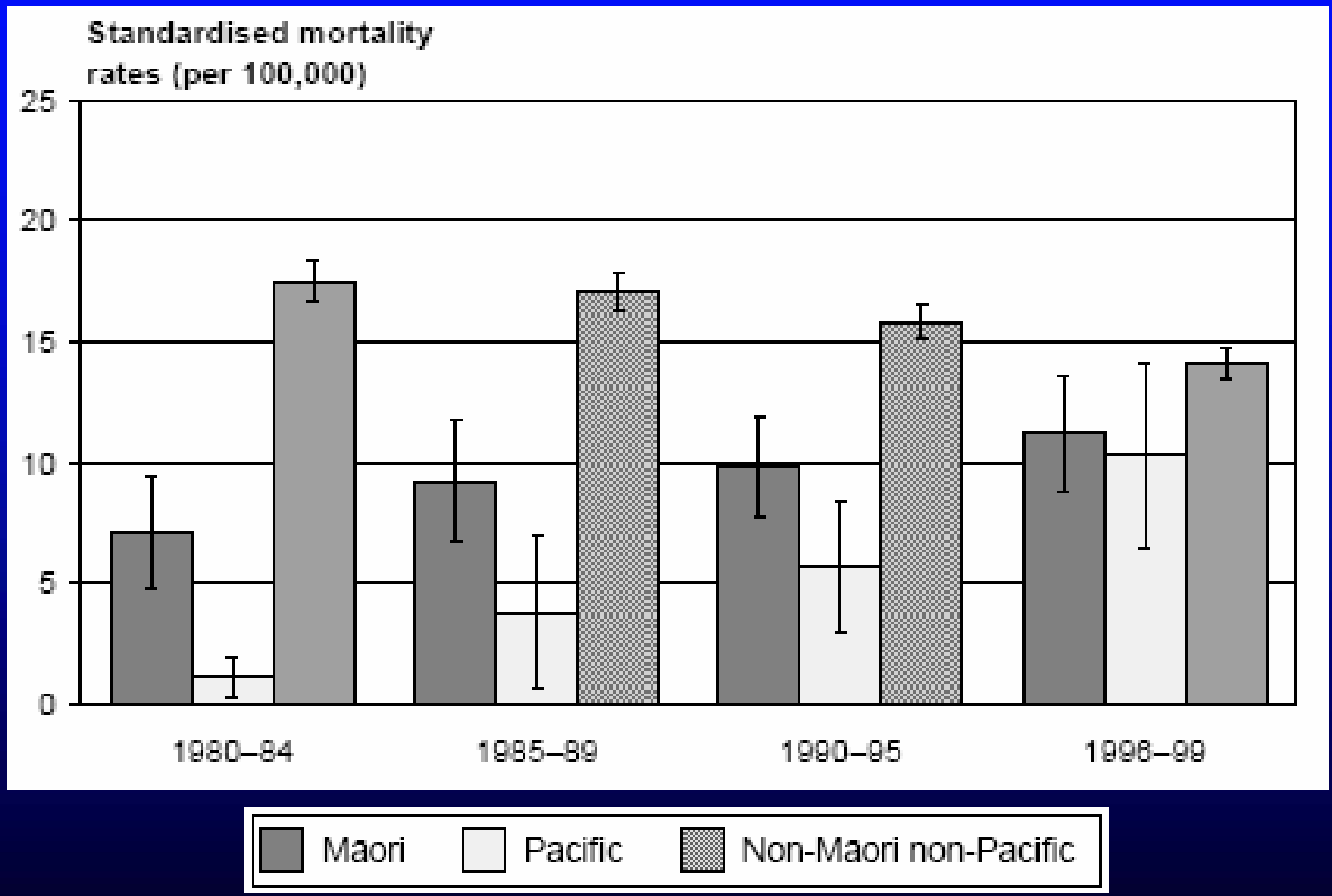
Source: Ajwani S, Blakely T, Robson B, Tobias M, Bonne M. 2003. *Decades of Disparity: Ethnic mortality trends in New Zealand 1980-1999*. Wellington: Ministry of Health and University of Otago.

Colorectal Cancer: Males 65-74 years old New Zealand, 1980-1999



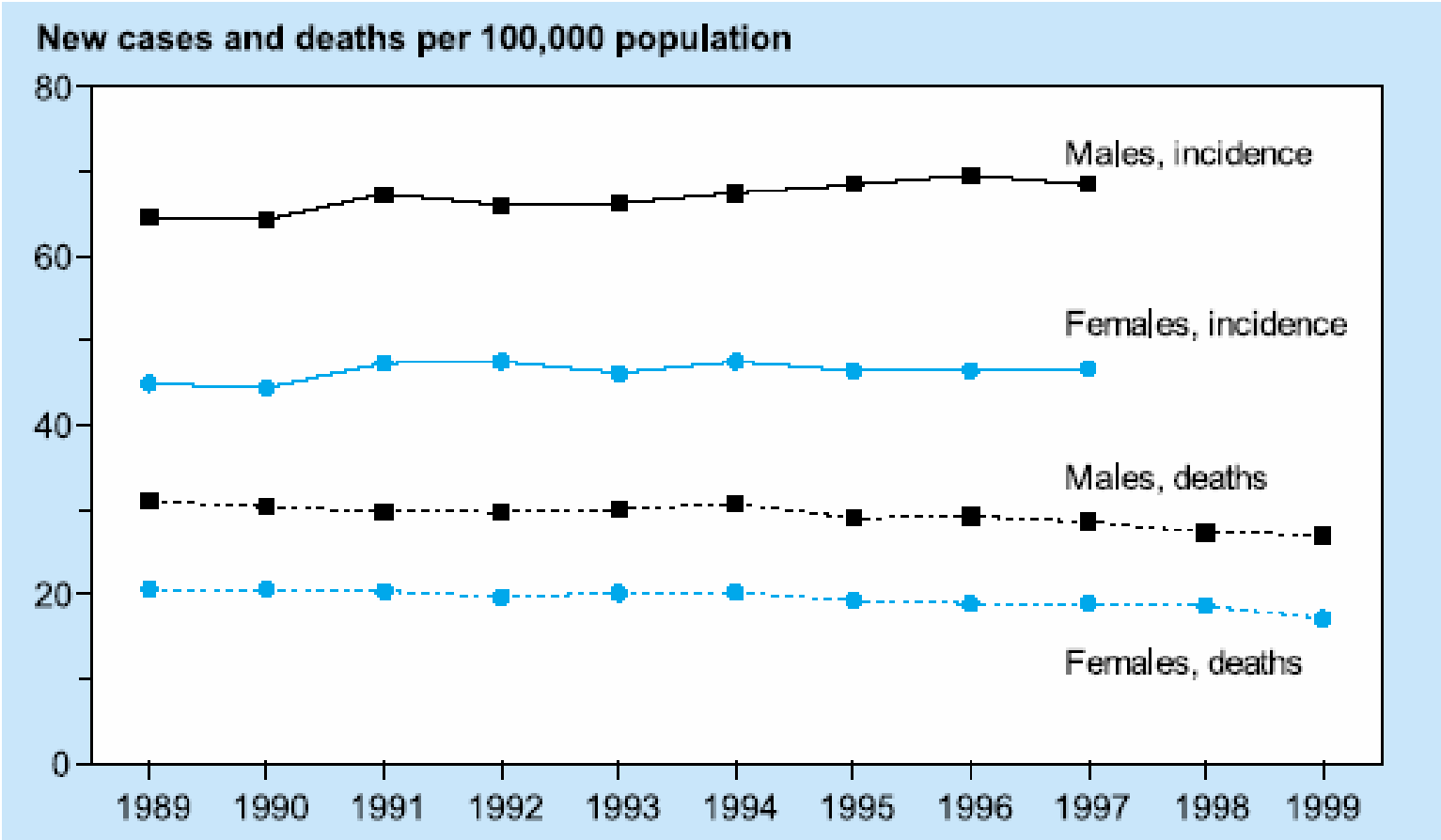
Source: Ajwani S, Blakely T, Robson B, Tobias M, Bonne M. 2003. *Decades of Disparity: Ethnic mortality trends in New Zealand 1980-1999*. Wellington: Ministry of Health and University of Otago.

Colorectal Cancer: Females New Zealand, 1980-1999



Source: Ajwani S, Blakely T, Robson B, Tobias M, Bonne M. 2003. *Decades of Disparity: Ethnic mortality trends in New Zealand 1980-1999*. Wellington: Ministry of Health and University of Otago.

Incidence and Death Rates for Colorectal Cancer, Australia 1989-1999



Notes

1. Colorectal cancer is classified according to the ICD-10 codes: C18–C21.
2. The incidence and death rates were age-adjusted using the total Australian population as at 30 June 1991.

Sources: AIHW National Cancer Statistics Clearing House Database and State and Territory cancer registries.

Cost per Year of Life Saved

- Mandatory motorcycle helmets $2,000
- Colorectal cancer screening $25,000
- Breast cancer screening $35,000
- Dual airbags in cars $120,000
- Smoke detectors in homes $210,000
- School bus seat belts $1,800,000

from John Bond, M.D.

Screening for Colorectal Cance

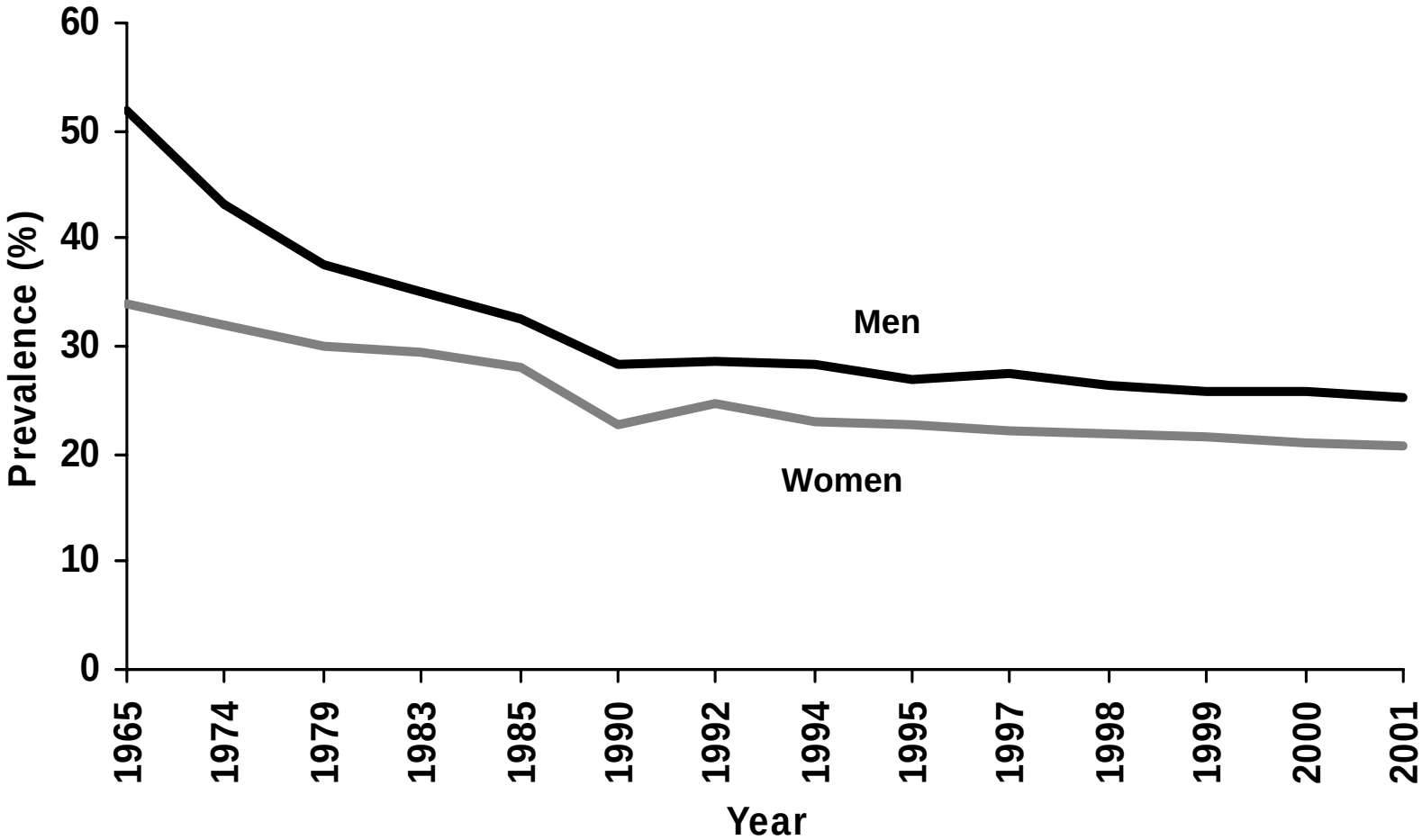
- "At risk" - those >50yr 80 million
- Screened per year
  - colonoscopy 2.0m
  - sigmoidoscopy 4.5m
  - FOBT 9.5m
  - DCBE 0.1m
  - TOTAL PROCEDURES 16.1m

NAMCS; NHAMCS;NHDS;NHIS;BRFSST; etc. - from William Grady M.D.

We know that tobacco causes a major increase in risk of several different cancers as well as heart and lung disease……..

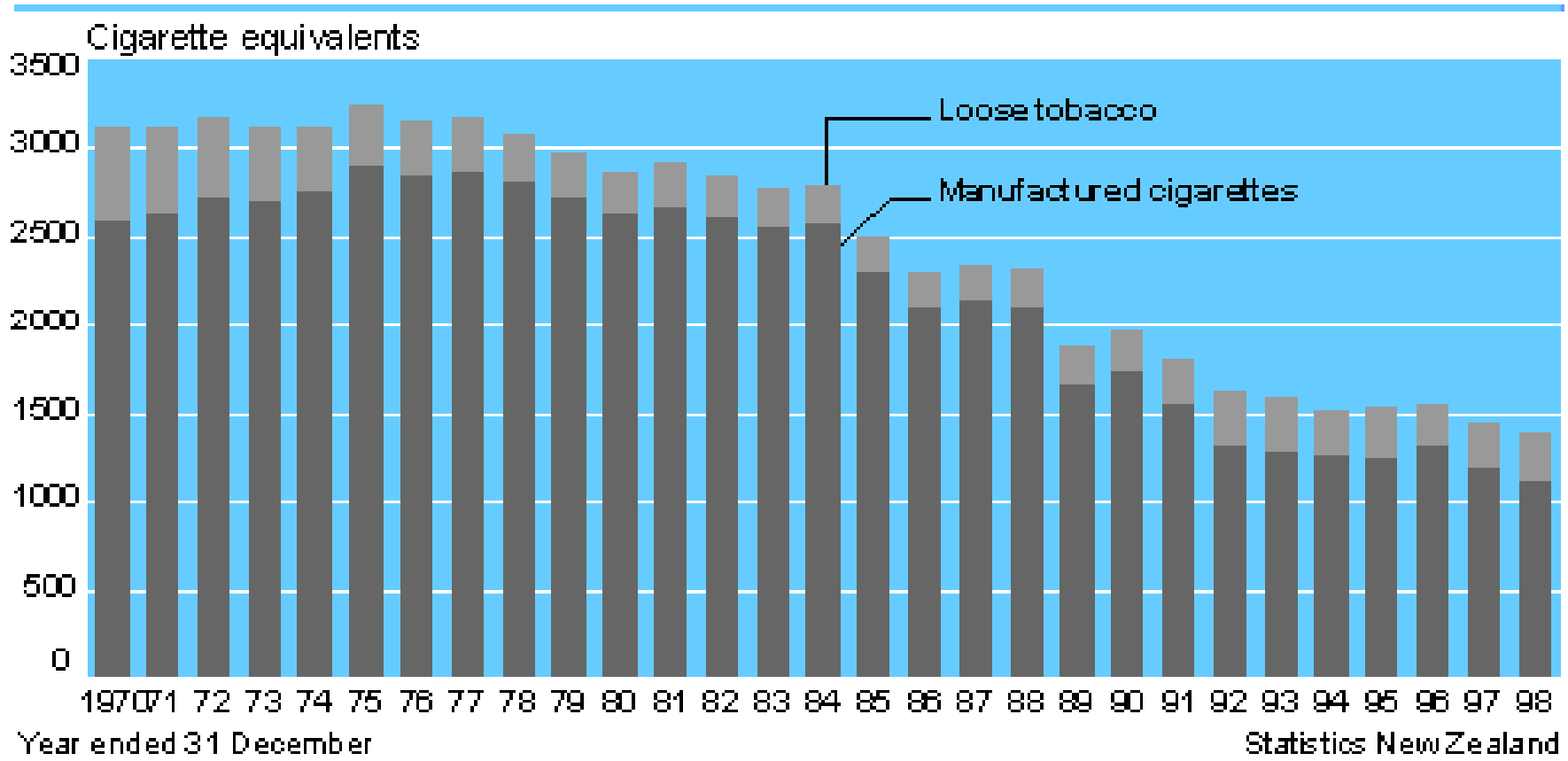
……and therefore a big increase of dying young and in pain

Cigarette Smoking among Adults 18 and Older in the US, 1965-2001



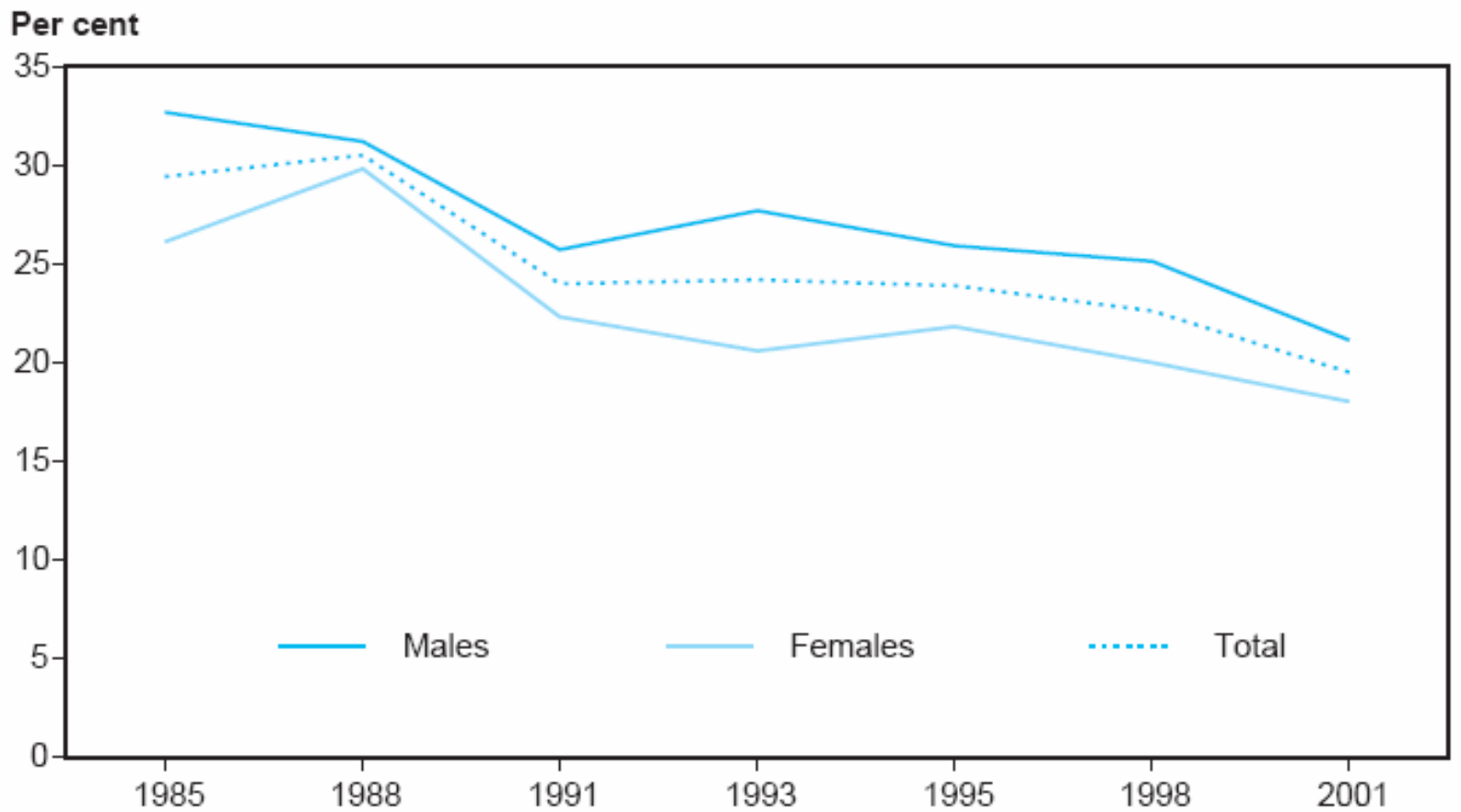
Source: National Health Interview Survey, 1965-2001, National Center for Health Statistics, Centers for Disease Control and Prevention, 2003.

Tobacco Consumption Per Person Aged 15 Years and Older, New Zealand 1970-1998



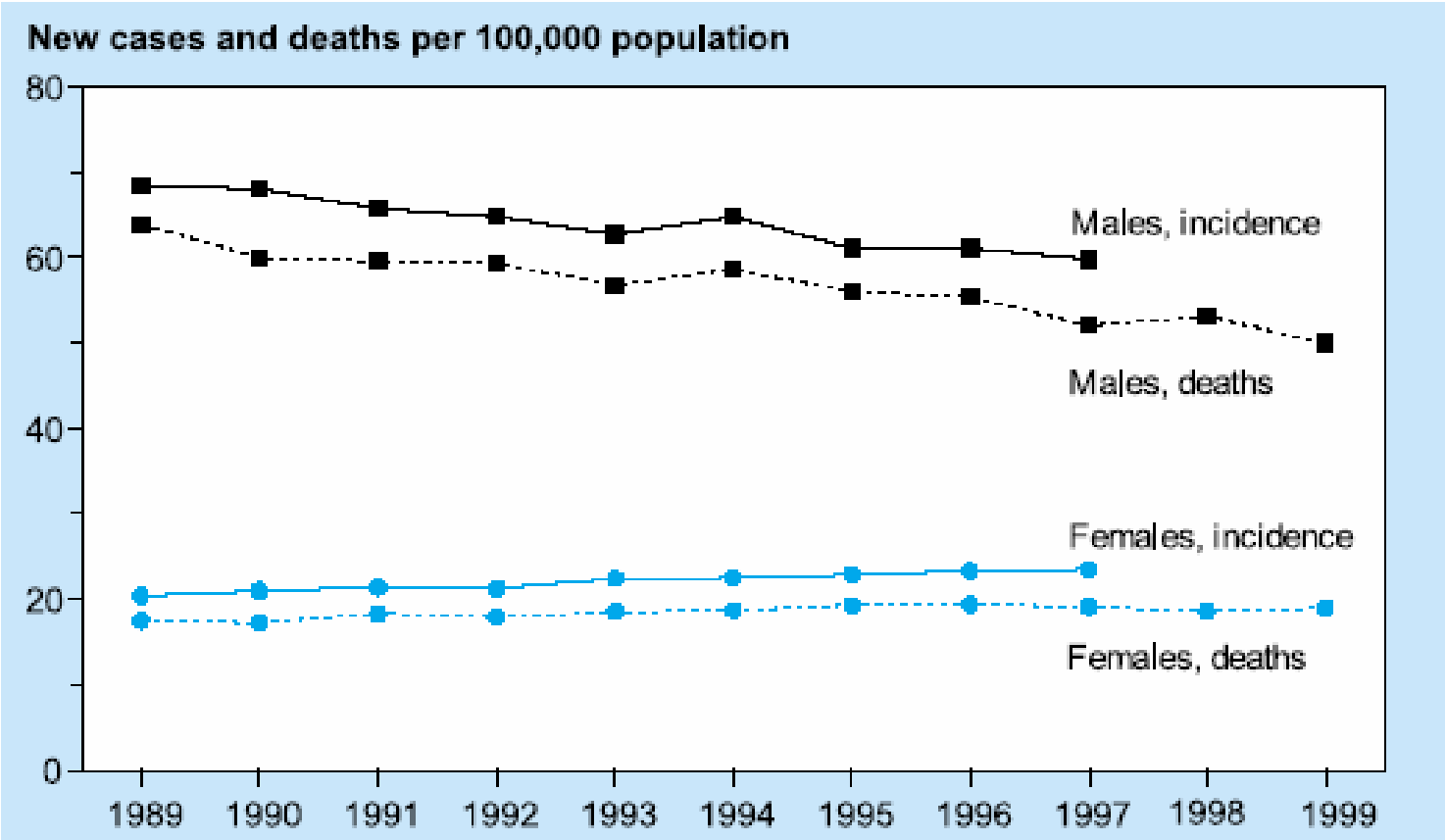
Source: New Zealand Official Yearbook 2000

Proportion of Persons Aged 14 Years and Older who Smoke Daily, Australia, 1985-2001



Sources: National Campaign Against Drug Abuse Social Issues surveys 1985, 1988; National Campaign Against Drug Abuse Household surveys 1991, 1993; National Drug Strategy Household surveys 1995, 1998, 2001.

Incidence and Death Rates for Cancer of the Trachea, Bronchus, and Lung Australia, 1989-1999

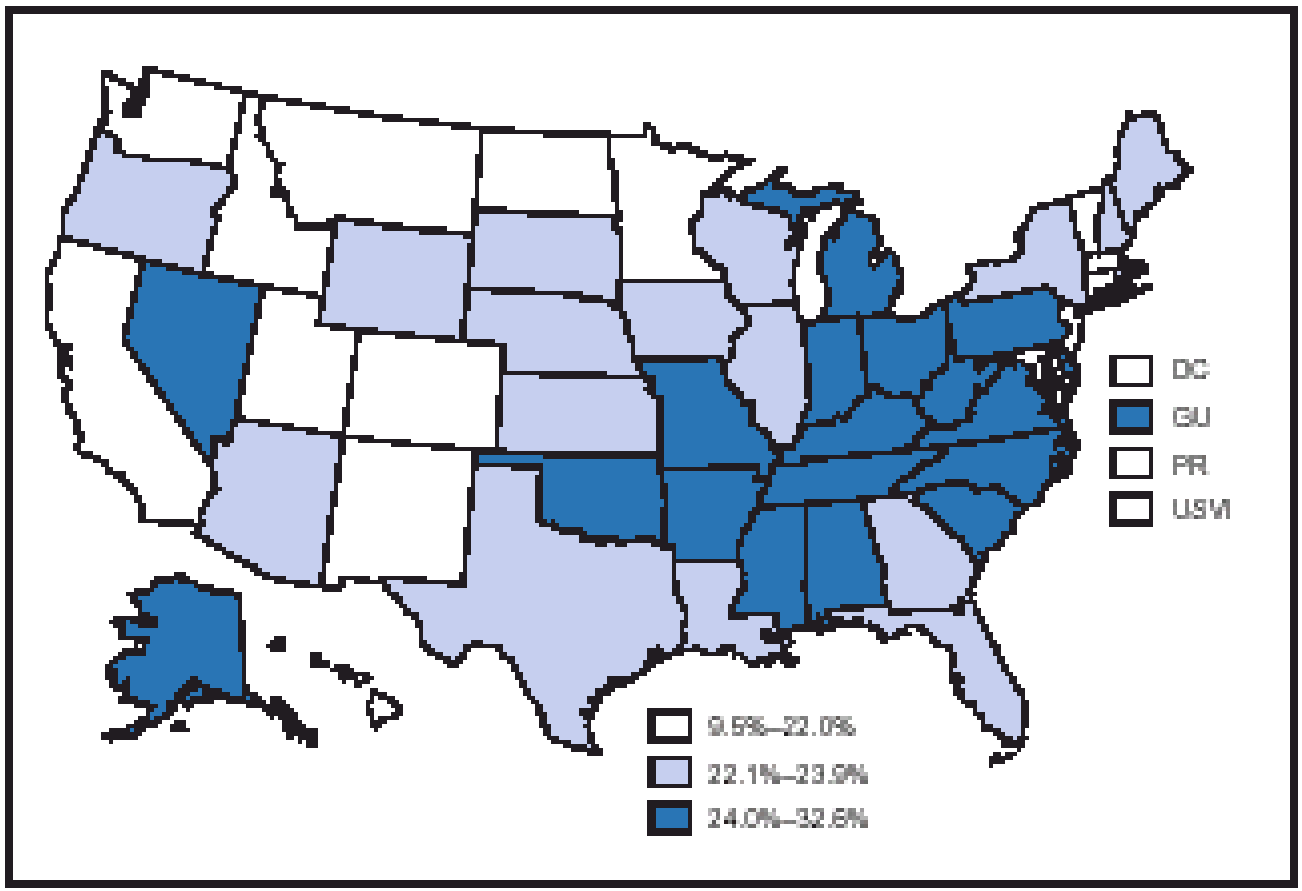


Notes

1. Cancer of the trachea, bronchus and lung is classified according to the ICD-10 codes: C33–C34.
2. The incidence and death rates were age-adjusted using the total Australian population as at 30 June 1991.

Sources: AIHW National Cancer Statistics Clearing House Database and State and Territory cancer registries.

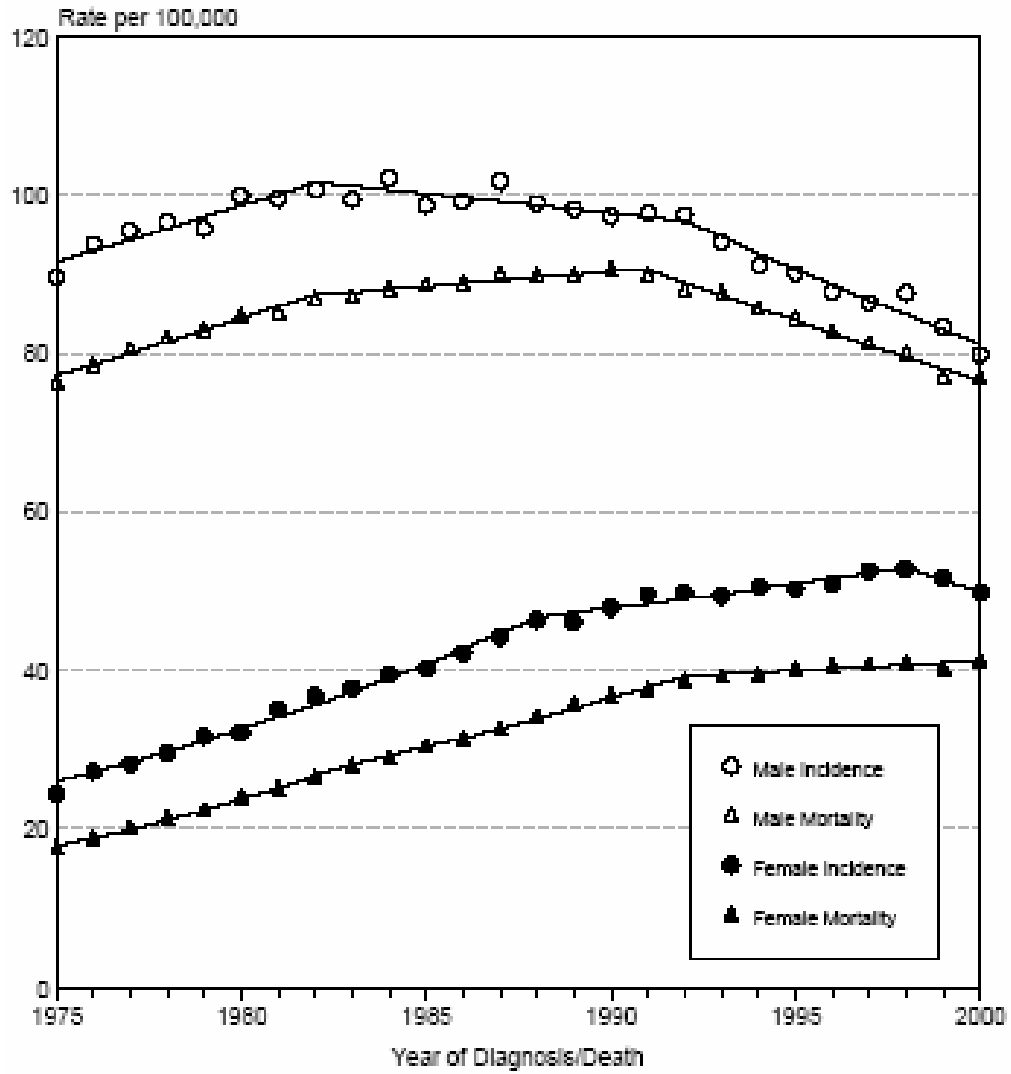
Prevalence of Current Cigarette Smoking Among Adults 18 and Older in the US, 2002



* The percentage of all adults in each state/area who reported having smoked ≥100 cigarettes during their lifetimes and who currently smoke every day or some days.

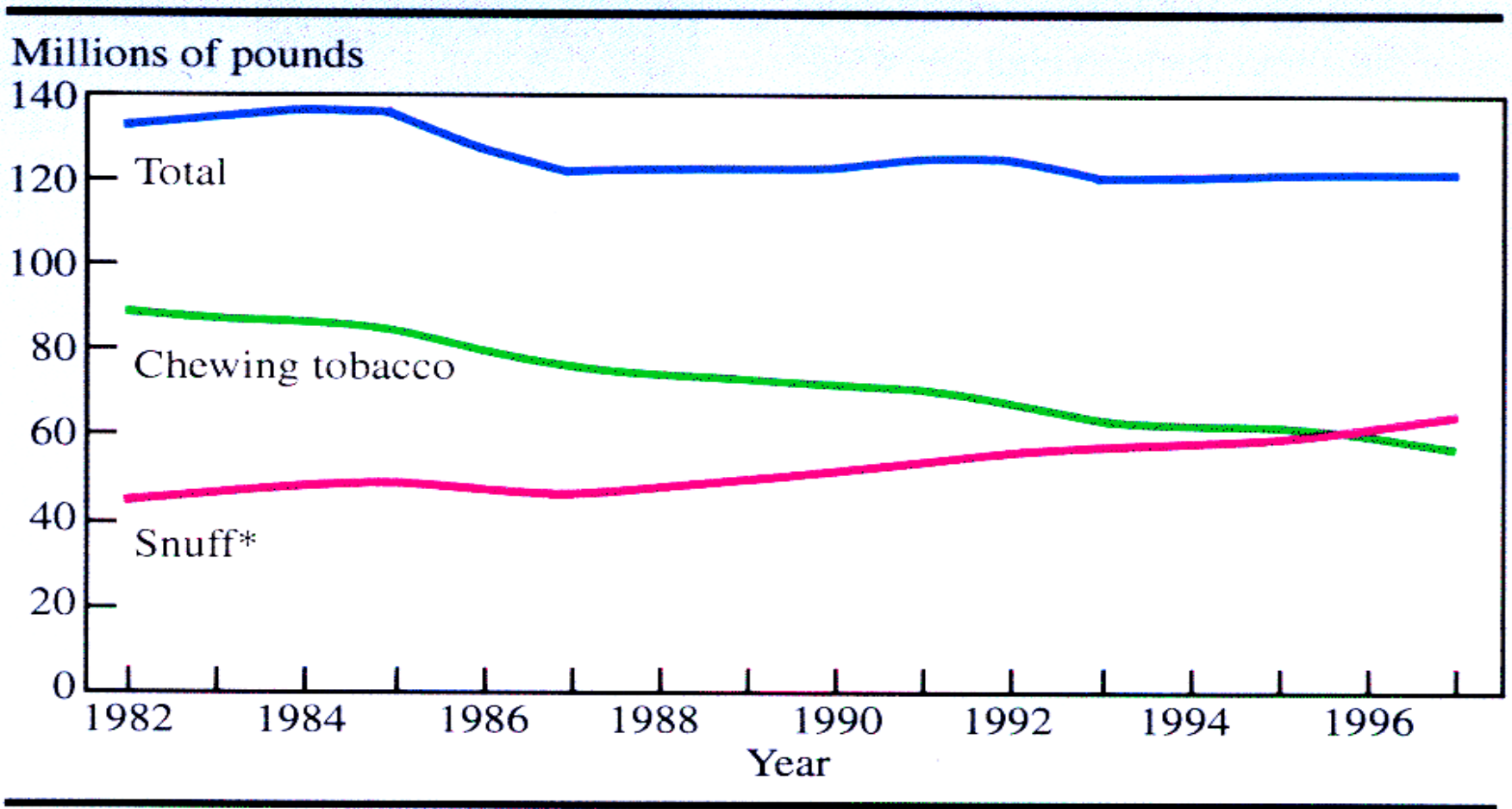
Source: The Morbidity and Mortality Weekly Report, 52(53);1277-1280, (CDC 2004).

Cancer of the Lung and Bronchus Incidence and US Death Rates, 1975-2000



Source: SEER 9 areas and NCHS public use data file. Rates are age-adjusted to the 2000 US standard million population by 5-year age groups. Regression lines are calculated using the Joinpoint Regression Program.

Consumption of Chewing Tobacco and Snuff US - 1982-1997

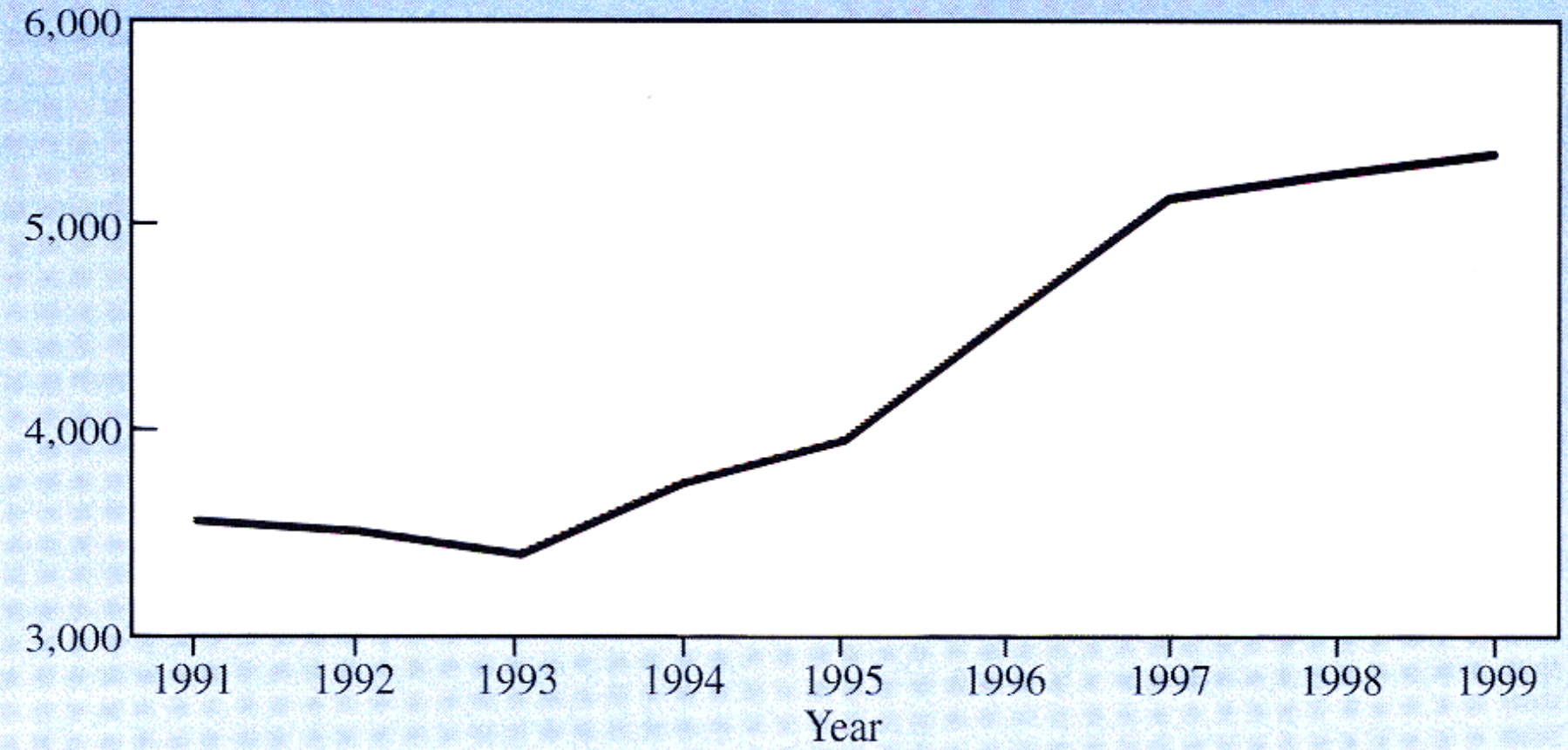


*Includes both dry and moist snuff.

Source: U.S. Department of Agriculture

– By Don Shopland

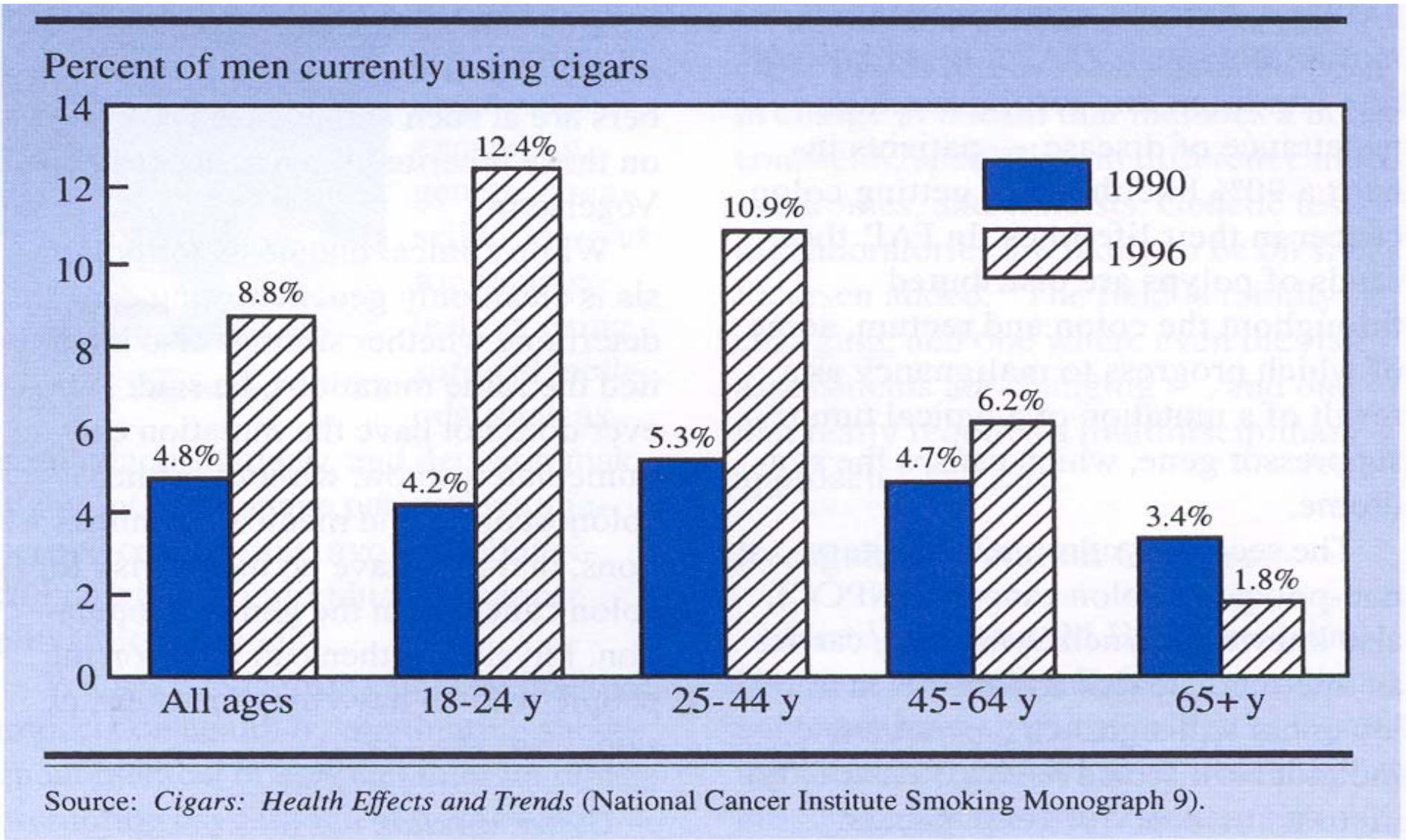
Trends in US Cigar Consumption



*Includes both large and small cigars sold for domestic consumption.

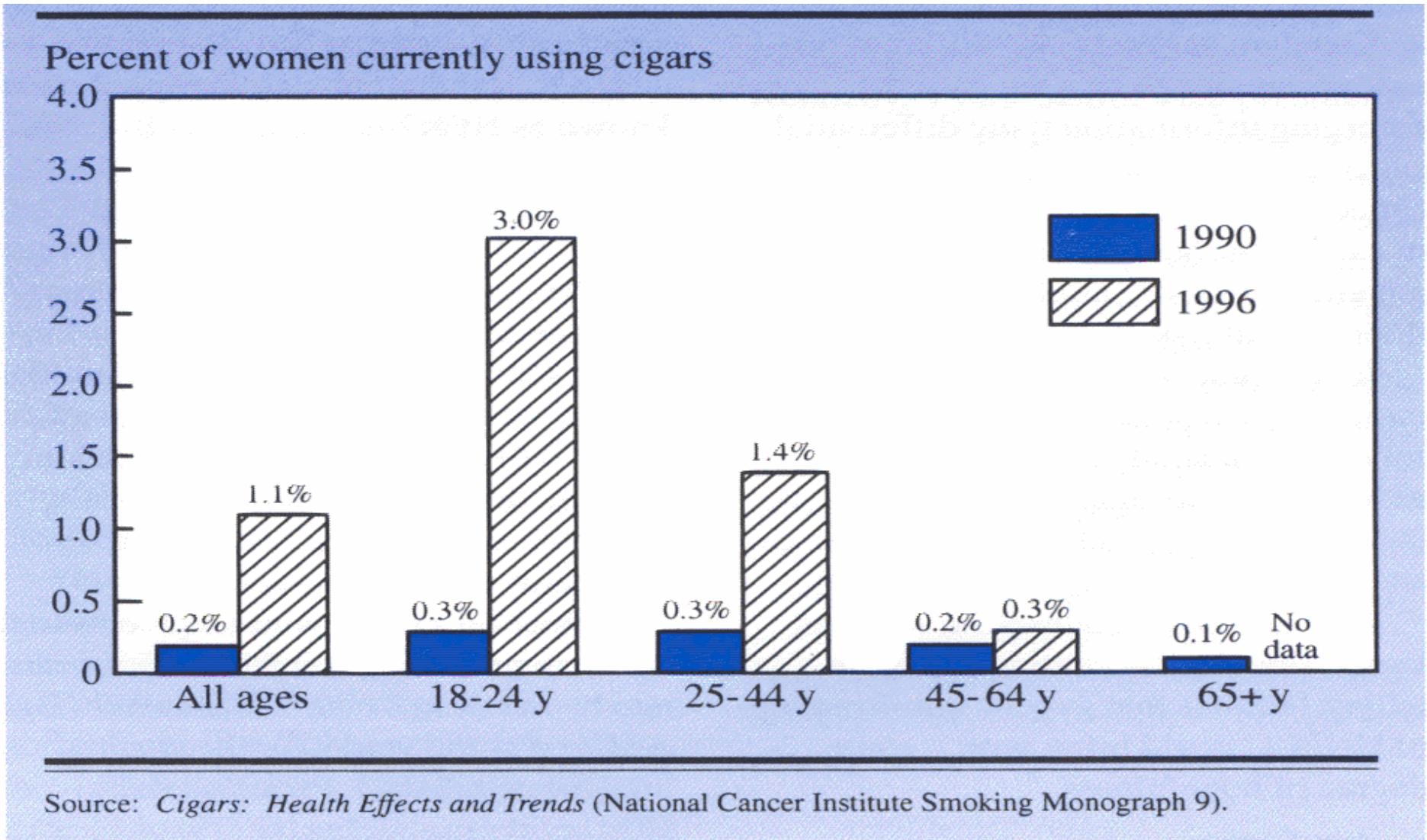
Source: U.S. Department of Agriculture tables, 1999 preliminary data: access at www.econ.ag.gov/Briefing/tobacco/

Cigar Smoking among Men
US - 1990-1996



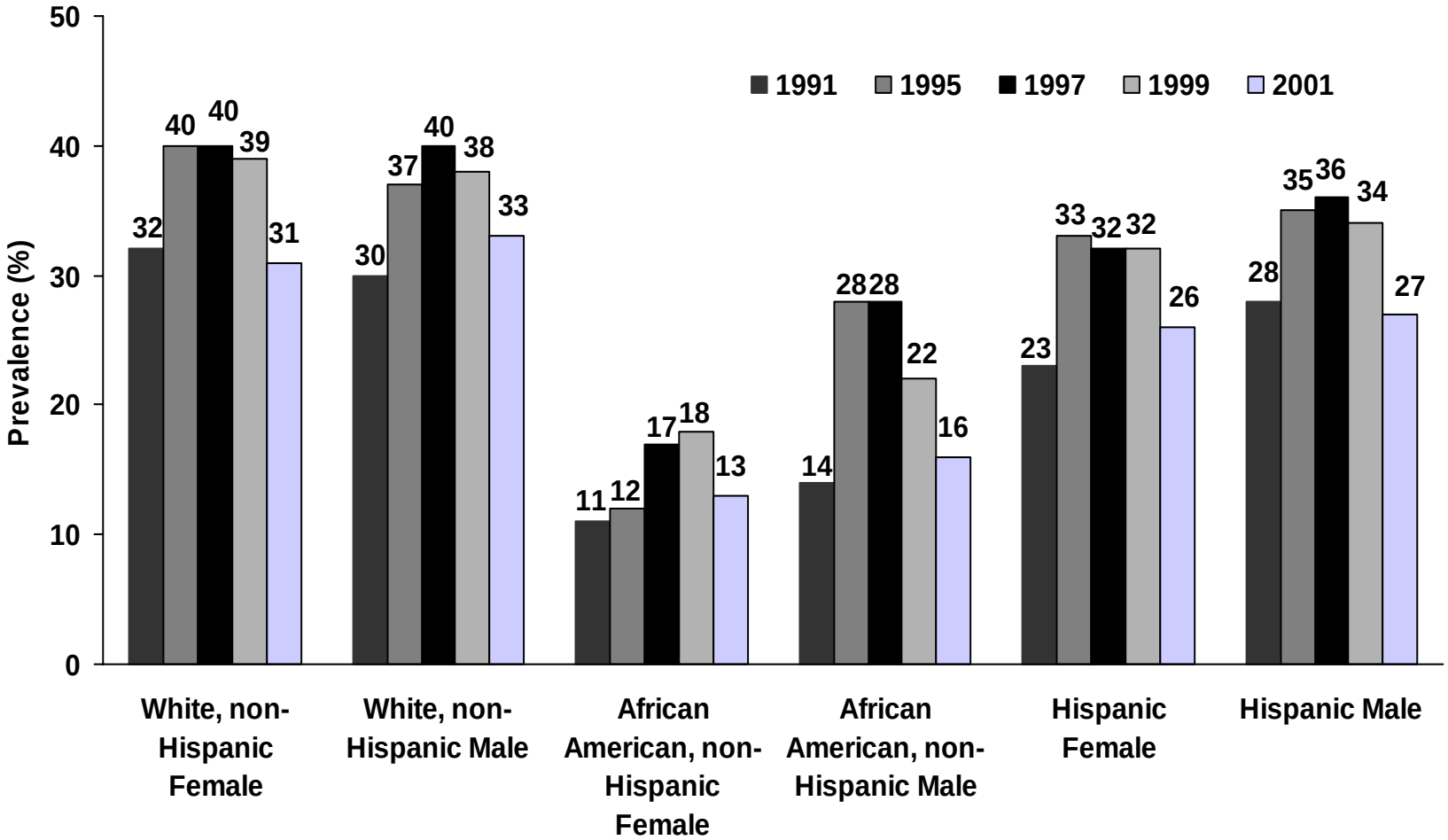
Source: *Cigars: Health Effects and Trends* (National Cancer Institute Smoking Monograph 9).

Cigar Smoking among Women
US - 1990-1996



Source: *Cigars: Health Effects and Trends* (National Cancer Institute Smoking Monograph 9).

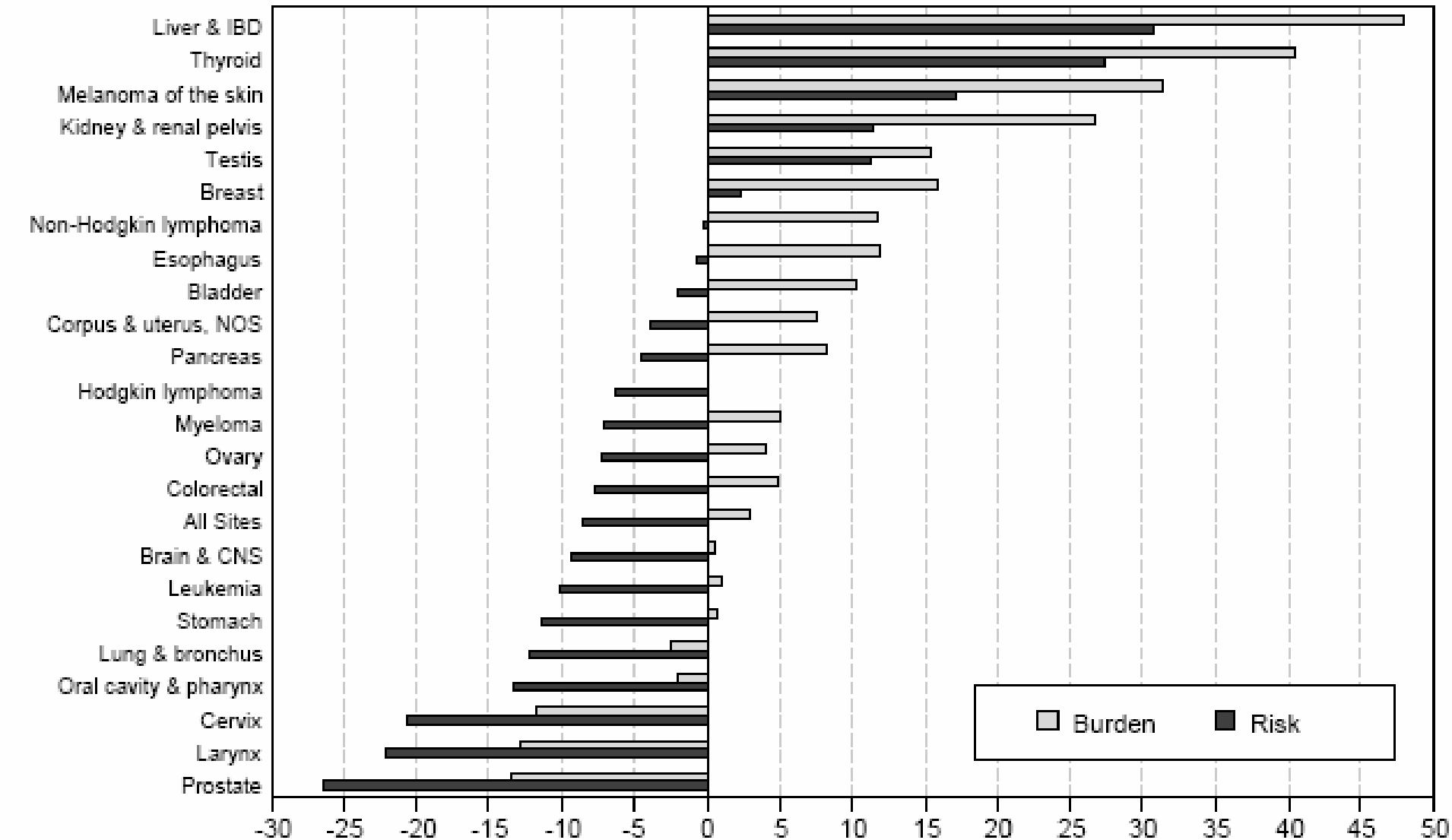
Current Cigarette Smoking Among US High School Students, 1991-2001



*Smoked cigarettes on one or more of the 30 days preceding the survey.

Source: Youth Risk Behavior Surveillance System, 1991, 1995, 1997, 1999, 2001, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, 2002.

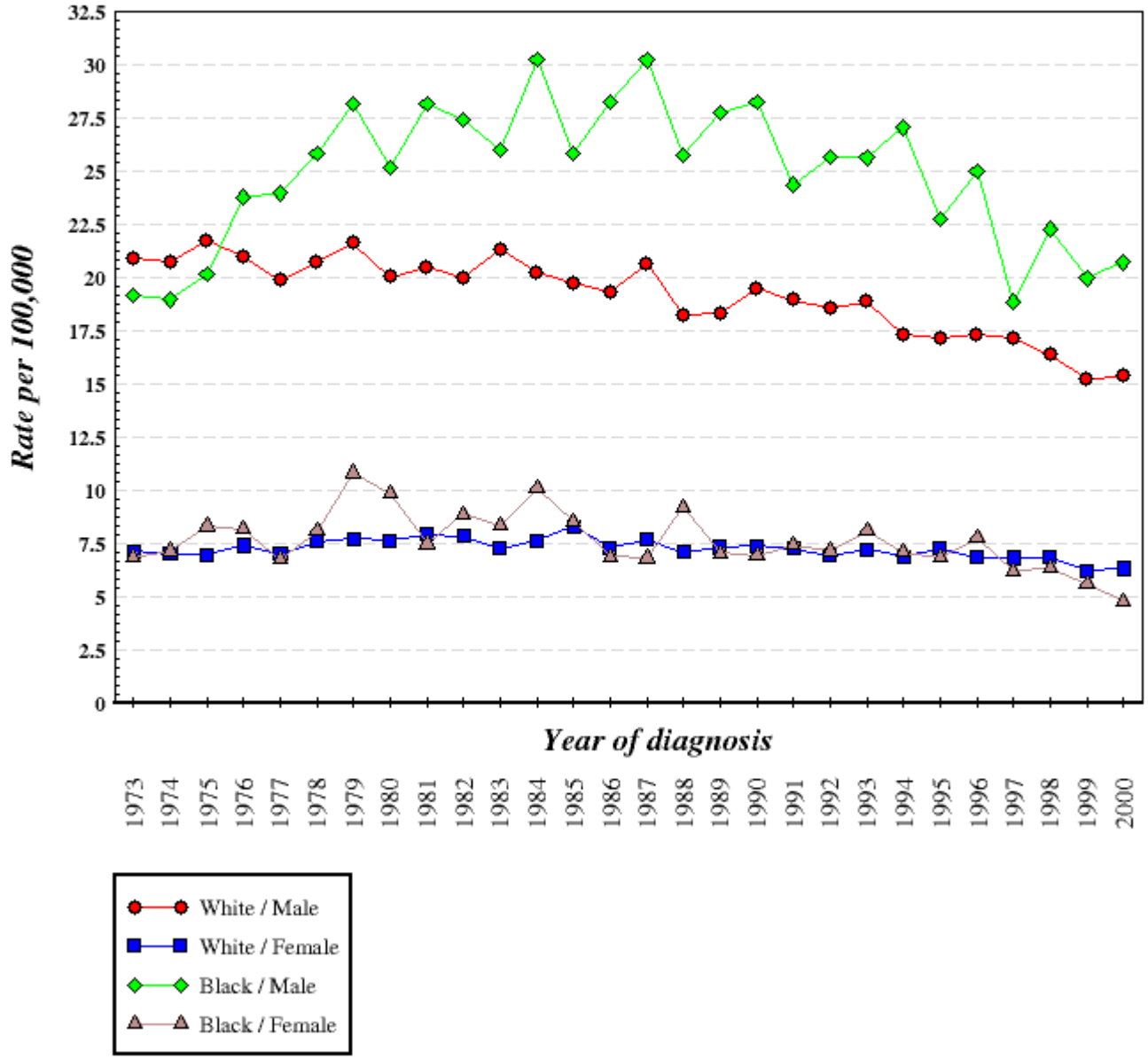
Percent Change in Cancer Incidence, 1992-2000
Numbers (burden) vs Rates (risk), All Ages, USA



Source: SEER Cancer Statistics Review, 1975-2000, (NCI 2003)

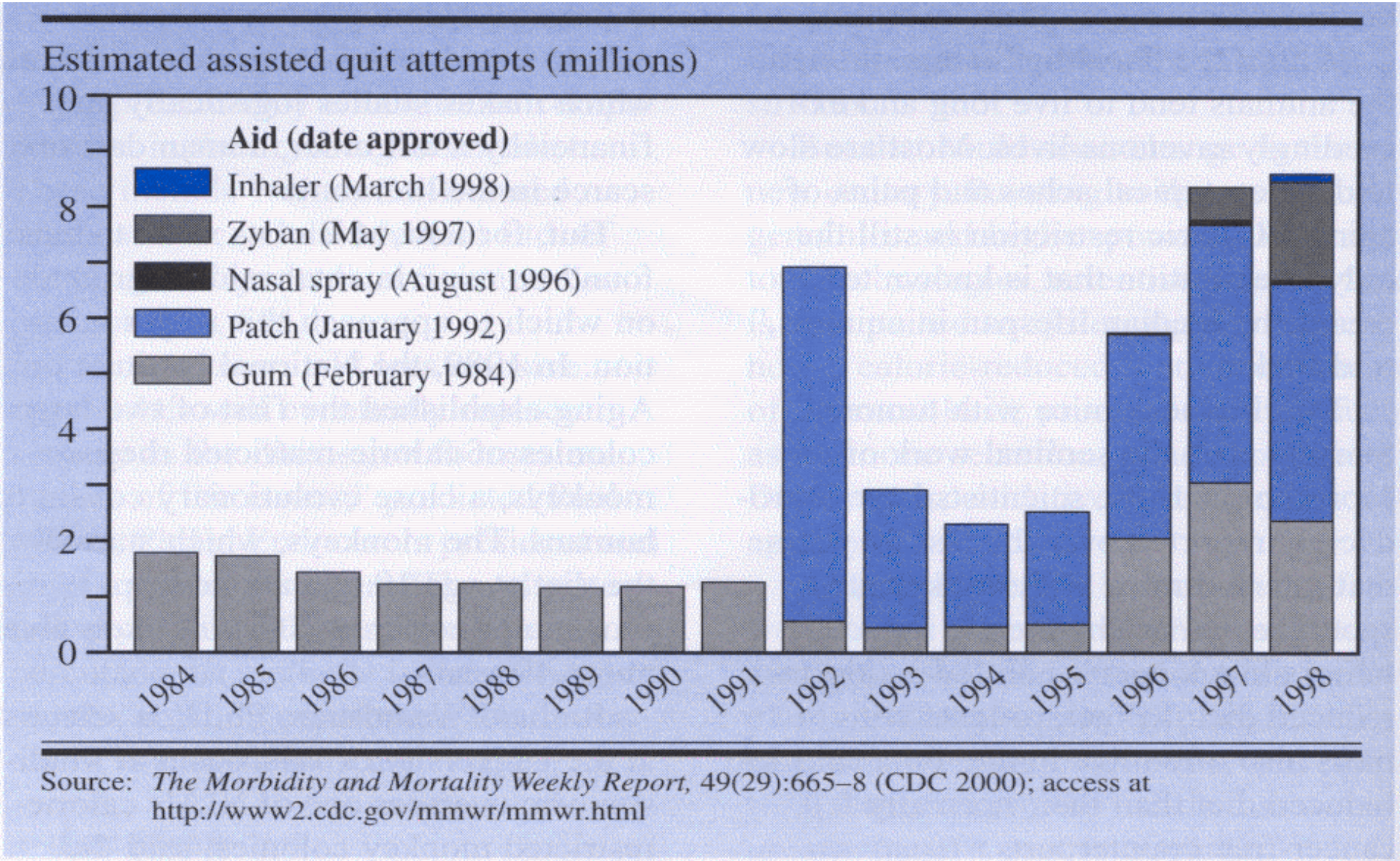
Although there is still a great deal to learn about the causes and prevention of cancer, we do not yet put into practice much that we already know

Oral Cavity and Pharynx Cancers 1973-2000



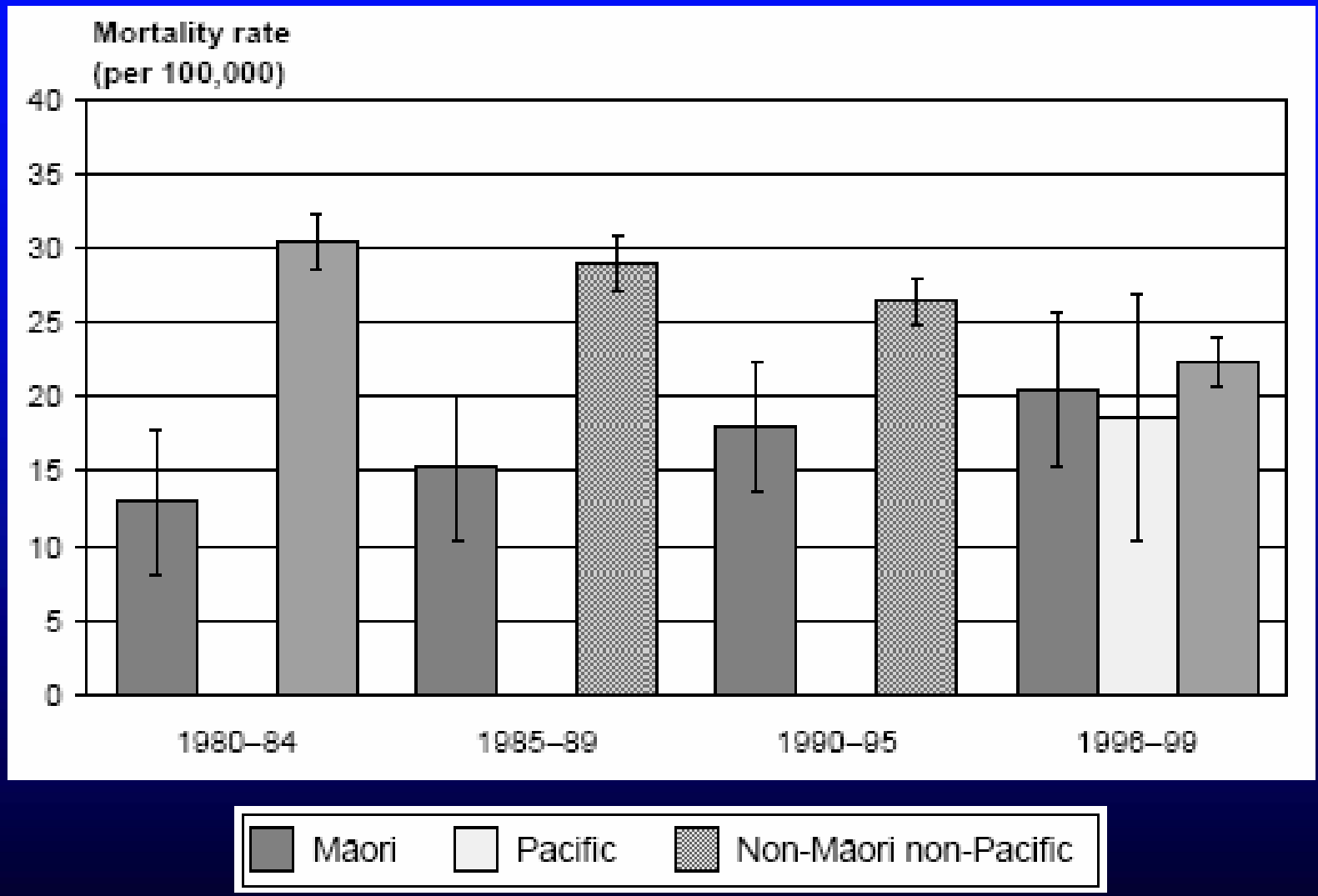
Source: SEER Cancer Statistics Review, 1975-2000, (NCI 2003)

Use of Pharmacologic Treatments for Smoking Cessation - 1984-1998 - US



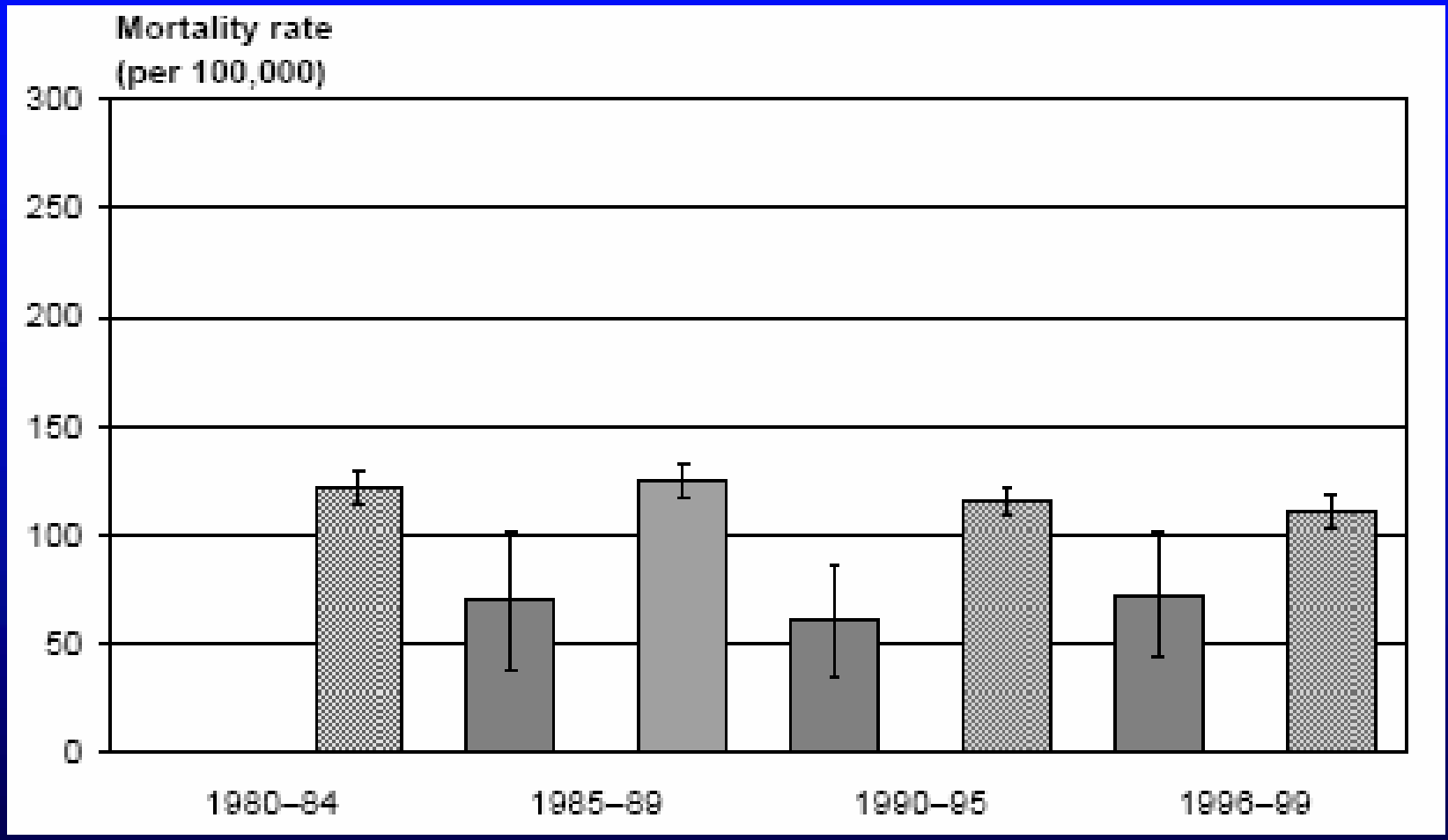
Source: *The Morbidity and Mortality Weekly Report,* 49(29):665–8 (CDC 2000); access at http://www2.cdc.gov/mmwr/mmwr.html

Colorectal Cancer: Females 35-64 years old New Zealand, 1980-1999



Source: Ajwani S, Blakely T, Robson B, Tobias M, Bonne M. 2003. *Decades of Disparity: Ethnic mortality trends in New Zealand 1980-1999*. Wellington: Ministry of Health and University of Otago.

Colorectal Cancer: Females 65-74 years old New Zealand, 1980-1999



Source: Ajwani S, Blakely T, Robson B, Tobias M, Bonne M. 2003. *Decades of Disparity: Ethnic mortality trends in New Zealand 1980-1999*. Wellington: Ministry of Health and University of Otago.