



### SMOKING PREVALENCE AND THE CONTRIBUTION OF CIGARETTE SMOKING TO MORTALITY AND MORBIDITY IN QUEENSLAND

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1993 and 1998. However, the smoking prevalence significantly increased among the 18-29 year age group, from 32% in 1993 to 37% in 1998 (Figure 6).

- A statistically significant increase in the proportion of secondary school children who smoked was observed between 1993 and 1996. Amongst schoolchildren in 1996, smoking prevalence increased with each successive Year level, with 31% of Year 12 males and 33% of Year 12 females reporting having smoked in the last seven days (Figure 7). The majority of new smokers are being recruited in the early years of secondary school.
- In 1992, the smoking prevalence in Australia was similar to that of New Zealand, the United Kingdom and the United States (Figure 2).
- It is estimated that cigarette smoking directly contributed to more than 3000 deaths per year (15% of all deaths) in Queensland between 1992 and 1996. The majority (73%) of these deaths were due to lung cancer, ischaemic heart disease or chronic obstructive pulmonary disease. Although most smoking-related deaths affected adults aged 40 years and over, it is estimated that 8% of all deaths of children aged 0-4 years were directly attributable to cigarette smoking. Deaths in this age group were primarily due to smoking by parents resulting in low-birthweight babies and SIDS. Over three-quarters (76%) of cigarette-related deaths occurred in males, reflecting the higher smoking prevalence amongst males (compared to females) in the past.
- Cigarette smoking was estimated to have directly contributed to more than 27,000 hospital separations per year (3% of all hospital separations) during 1995/96 and 1996/97. In 1996/97, more than 185,000 occupied bed days were directly attributed to cigarette smoking, costing Queenslanders over \$108 million.
- Of particular concern is the increase in the number of teenagers and young adults taking up smoking as well as the high smoking prevalence in Indigenous populations and among persons of low socio-economic status. Prevention strategies to target these high-risk groups are needed.

### SUMMARY

- The proportion of Queenslanders who smoked in 1995 was 25.3%, slightly above the Australian average (23.7%) (Figure 1). Among Queenslanders aged 18 years and over in 1998, smoking prevalence was highest amongst males (males: 27%, females: 23%) and persons in the 18-29 year age group (36%) (Figure 3).
- Smoking prevalence increased with increasing levels of socio-economic disadvantage, and was significantly higher in the indigenous population. There was no marked difference in smoking prevalence between urban and rural areas (Figure 4).
- There was no significant change in overall smoking prevalence among adults in Queensland between

## INTRODUCTION

Smoking is the largest contributor to preventable mortality in Australia (Commonwealth Department of Community Services and Health, 1994). Smoking tobacco strongly increases the risk of lung cancer, cardiovascular disease, chronic obstructive pulmonary disease, and several other conditions. Major reviews of the scientific evidence also confirm that there are important associations between passive smoking and lung cancer (NHMRC, 1997; Hackshaw, Law and Wald, 1997). Preventing the uptake of smoking by young people is a priority issue since early uptake of smoking increases the length of exposure to tobacco smoke, which in turn, increases the risk of developing a smoking-related illness.

The analysis undertaken in this report describes smoking prevalence and also applies aetiological fractions to quantify the effects of cigarette smoking on mortality and hospital use in the Queensland population. A brief discussion of the data sources used to determine smoking prevalence and the application of the aetiological fractions has been provided in the Methodology section.

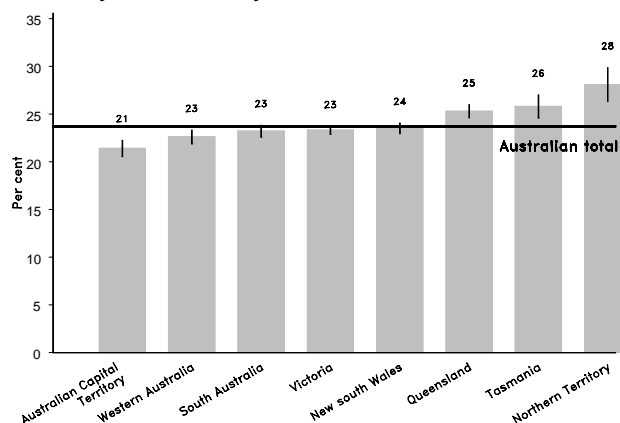
## SMOKING PREVALENCE

Smoking prevalence can be defined as the proportion of adults who smoke one or more cigarettes per day on average, or are current smokers (Queensland Health Outcome Indicators Dictionary, 1998). Unless stated otherwise, it is this definition for smoking prevalence that has been used throughout this report. The information presented on smoking prevalence in this report is based on self-reported data and hence may underestimate the true prevalence. A reduction in smoking prevalence has been identified as a goal in the *First Report on National Health Priority Areas* (NHPA) (AIHW, 1997). The target for smoking prevalence by the year 2000 is 20% for both males and females.

### State and territory comparisons

The percentage of Queenslanders aged over 18 years who reported to be current smokers in 1995 was 25.3%, which was significantly higher than the national average of 23.7% (1995 National Health Survey). Queensland had the third highest proportion of smokers compared to the other states and territories (Figure 1). This state ranking has increased from 5<sup>th</sup> in 1989/90, when the Queensland proportion was equivalent to the national average of 28% (1989/90 National Health Survey).

**Figure 1 Age-standardised smoking prevalence (%) in Australia by state in territory in 1995**

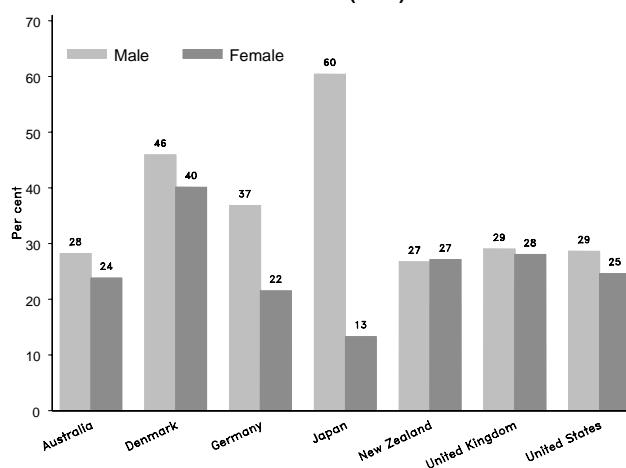


Vertical lines indicate 95% confidence intervals for true population prevalence  
Age-standardised to 1991 Australian population  
Data source: 1995 National Health Survey (ABS)

## International comparisons

In 1992, the smoking prevalence in Australia was similar to that of New Zealand, the United Kingdom and the United States (OECD Health Data, 1997). Males in Japan, Germany and Denmark had a higher smoking prevalence than Australian males, while females in Germany and Japan had lower smoking prevalence than Australian females (Figure 2). Japan had a very high proportion of males who smoked but a very low proportion of female smokers.

**Figure 2 International comparisons of the prevalence of smoking in selected OECD countries (1992)**

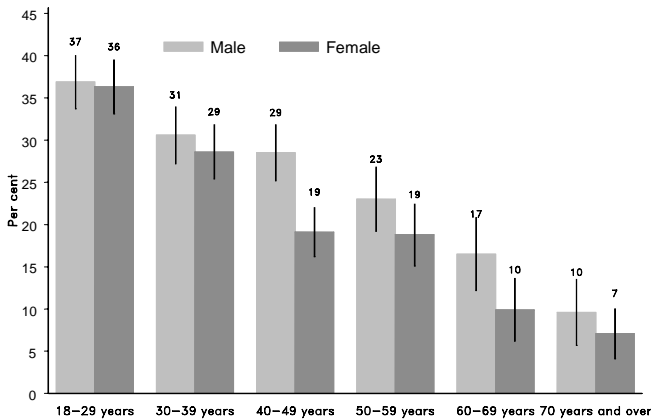


Data source: OECD Health Data (1997)

## Smoking prevalence by age and sex

The prevalence of smoking in Queensland in 1998 was higher among males (27%) than among females (23%) (1998 Statewide Health Survey). The highest smoking prevalence was in young people, with smoking prevalence decreasing with increasing age (Figure 3). The sex differential in smoking prevalence was less notable in the 18-29 and 30-39 year age groups compared to older age groups.

**Figure 3 Smoking prevalence (%) by age group and sex in Queensland in 1998**



Data source: 1998 Statewide Health Survey (SWHS)  
Vertical lines indicate 95% confidence intervals for true population prevalence

### Urban/rural differences in smoking prevalence

The smoking prevalence in rural areas was slightly lower than in the capital city and other major urban areas (1998 Statewide Health Survey), but these differences were not statistically significant (Figure 4).

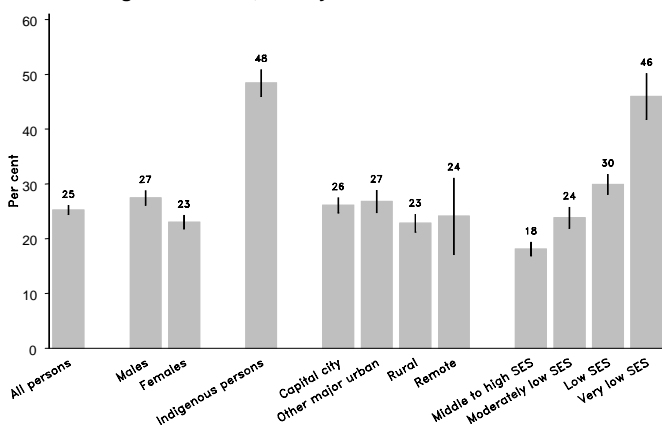
### Socio-economic differences in smoking prevalence

Among adults with very low socio-economic status the reported smoking prevalence was 46% compared to 18% among adults with middle to high levels of socio-economic status (Figure 4; 1998 Statewide Health Survey).

### Smoking prevalence in Indigenous populations

Of Indigenous persons aged 13 years and over who were surveyed in Queensland in 1994 (1994 National Aboriginal and Torres Strait Islander Survey), 48% smoked one or more cigarettes daily (Figure 4). This rate is almost twice the smoking prevalence among all adults in Queensland.

**Figure 4 Smoking prevalence in Queensland in 1998, by sex, indigenous status, rurality and socio-economic status**

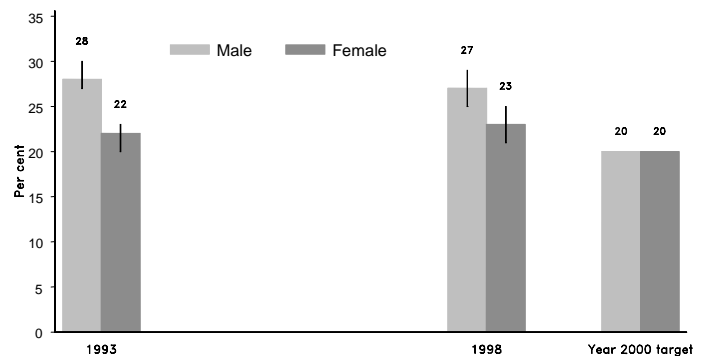


Vertical lines indicate 95% confidence intervals for true population prevalence  
Data source: 1998 Statewide Health Survey  
1994 National Aboriginal and Torres Strait Islander Survey

### Trends

Since the early 1980s, there has been a decline in smoking prevalence amongst both male and female adults in Australia, along with a corresponding decline in per capita tobacco consumption (Winstanley, Woodward and Walker, 1995). In Queensland there was no significant change in age standardised male and female smoking prevalence between 1993 and 1998 (Figure 5). In order to attain the NHPA target of a prevalence of regular smoking by both sexes of 20% in the year 2000 (AIHW, 1997), males need to decrease their smoking rates (in absolute terms) by approximately 7% and females by approximately 3% between 1998 and 2000.

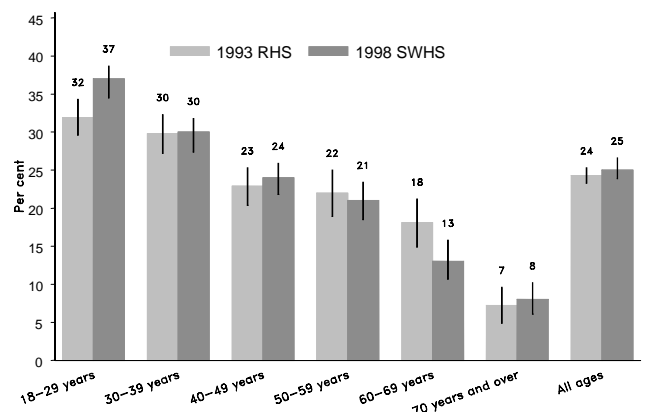
**Figure 5 Age-standardised smoking prevalence (%), by sex in Queensland in 1993 and 1998, with year 2000 target**



Data source: 1993 Regional Health Survey (RHS)  
1998 Statewide Health Survey (SWHS)  
First report on National Health Priority Areas 1996 (AIHW, 1997)  
Age standardised using 1991 Australian population  
Vertical lines indicate 95% confidence intervals for true population prevalence

The 18-29 year age group was the only age group to show a statistically significant increase in smoking prevalence, increasing from 32% in 1993 to 37% in 1998 (Figure 6). The proportion of smokers in most other age groups remained relatively constant, with a slight decrease among 60-69 year olds.

**Figure 6 Changes in smoking prevalence (%) by age group in Queensland between 1993 and 1998**



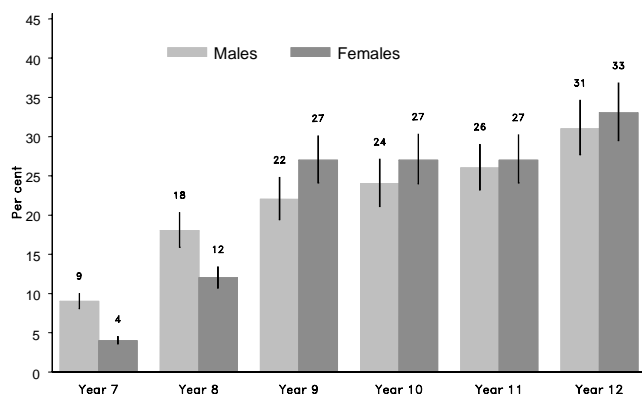
Data source: 1993 Regional Health Survey (RHS)  
1998 Statewide Health Survey (SWHS)  
Vertical lines indicate 95% confidence intervals for true population prevalence

## Smoking amongst Year 7 to 12 students

Every three years since 1984, surveys on the smoking habits of Australian schoolchildren have been conducted by each state based on the same series of questions (Lowe et al., 1997). The Queensland report for the 1996 survey showed that the proportion of students who had smoked within the previous seven days increased with successive Year levels (Figure 7). By Year 12, 31% of male students and 33% of female students reported having smoked within the previous seven days. It is important to note that teenagers outside the school system (particularly those who would have been in years 11 and 12) are not represented in these surveys. These teenagers may have a higher prevalence of smoking.

Of those students who had smoked in the previous week, the average number of cigarettes smoked also increased with successive Year levels, from less than 10 cigarettes per week in Year 7 to around 38 cigarettes per week in Year 12. Male students smoked more cigarettes than female students in most younger year levels, but tended to smoke a similar number of cigarettes on average when compared with female students in Year 12 (Lowe et al., 1997).

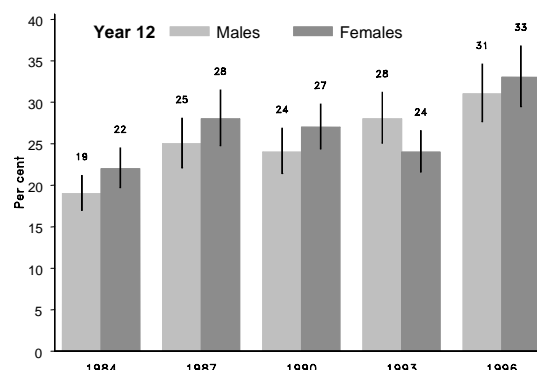
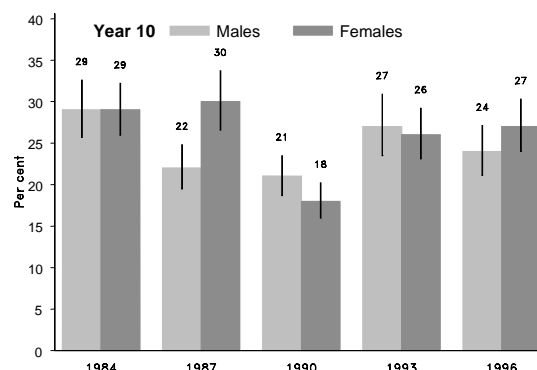
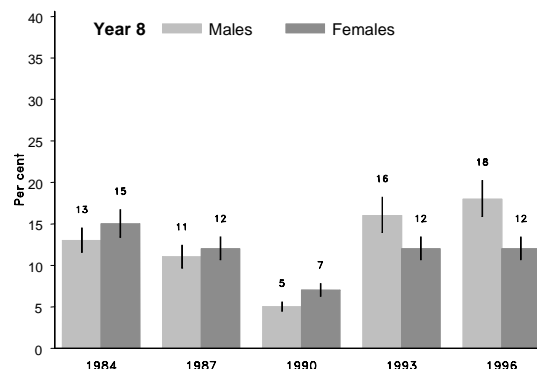
**Figure 7** Percentage of students who had smoked within the seven days prior to a 1996 survey in Queensland



Data source: Lowe et al.(1997)  
 Unpublished data (Centre for Health Promotion and Cancer Prevention Research)  
 Vertical lines indicate 95% confidence intervals for true population percentage

Compared to 1993, in 1996 there was a statistically significant increase in the proportion of students who reported smoking in the previous seven days and a corresponding decrease in the number of students who had not smoked in the last 12 months. During the 1980s, smoking prevalence generally decreased for students in younger Year levels, but increased for those in Year 12 (Figure 8). However, the prevalence of smoking has increased across all Year levels between 1990 and 1996.

**Figure 8** Trends in the percentage of students who had smoked within the seven days prior to a survey conducted in Queensland in 1984, 1987, 1990, 1993 and 1996



Data source: Lowe et al.(1997)  
 Unpublished data (Centre for Health Promotion and Cancer Prevention Research)  
 Vertical lines indicate 95% confidence intervals for true population percentage

Students reported friends as the single most common source of cigarettes with less than 50% of students purchasing their last cigarette. More than half of Year 7 students who bought their last cigarette did so from a coin operated machine. Students in higher year levels most commonly purchased their cigarettes from convenience stores, petrol stations and supermarkets (Lowe et al., 1997). Purchasing patterns may change with a new Queensland law introduced in May 1998

which made it an offence to sell or supply tobacco products to people under 18 years of age.

## THE CONTRIBUTION OF CIGARETTE SMOKING TO MORTALITY AND MORBIDITY IN QUEENSLAND

The information provided below has been summarised from a concurrent Queensland Health Information Circular (HIC, 1999).

### Mortality

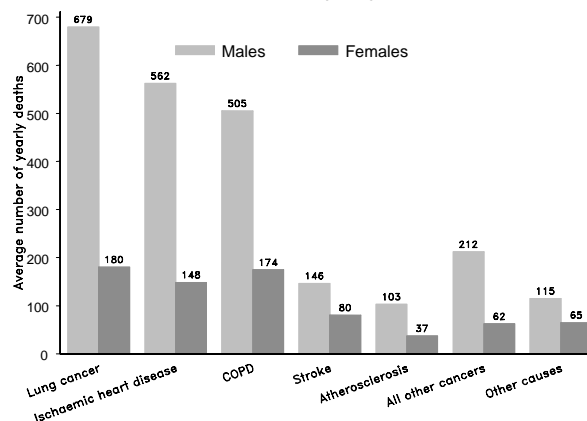
The average annual number of deaths from all causes which occurred between 1992 and 1996 in Queensland was 20,627. Of these, 3,069 deaths (15%) were estimated to be directly attributable to cigarette smoking.

Males accounted for 76% of the deaths directly attributable to cigarette smoking between 1992 and 1996 in Queensland. This represents 21% of all male deaths. In comparison 8% of all female deaths were due to cigarette smoking. The comparatively high proportion of male deaths reflects the much higher smoking prevalence amongst males twenty to thirty years ago. For example, in 1969 the prevalence of smoking amongst Australian males was 45% compared to 28% in females (Winstanley, Woodward and Walker, 1995).

In Queensland the age-standardised death rate directly attributable to cigarette smoking between 1992 to 1996 was 162 per 100,000 for males and 43 per 100,000 for females.

Between 1992 and 1996 most of the deaths which were directly attributable to smoking were due to lung cancer (28%), ischaemic heart disease (23%) and chronic obstructive pulmonary disease (COPD) (22%) (Figure 9). Stroke, atherosclerosis, and other cancers accounted for a further 21% of deaths attributable to smoking. Other smoking related cancers which contributed to a substantial number of deaths were cancers of the oesophagus, oropharynx, bladder, pancreas and cervix.

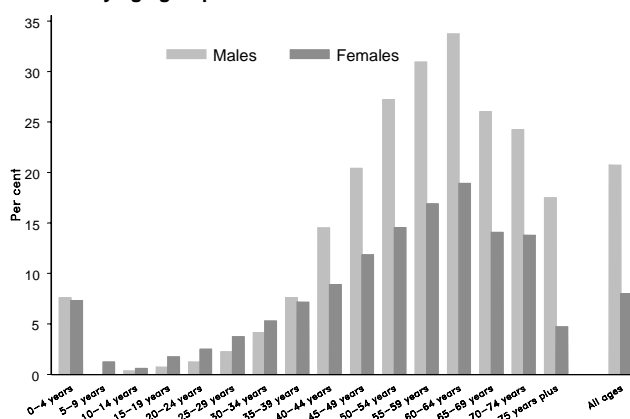
**Figure 9** Estimated average number of deaths per year directly attributable to cigarette smoking in Queensland between 1992 and 1996 by major cause of death



Data source: Health Information Centre, Queensland Health  
COPD: Chronic obstructive pulmonary disease

Although deaths from smoking predominantly affected adults aged 40 years and over, passive smoking also contributed to deaths in children, particularly aged 0-4 years (Figure 10). The smoking related conditions which caused death in this age group between 1992 and 1996 were sudden infant death syndrome, low birth weight and fire injuries. It is estimated that 7.5% of all deaths among children aged 0-4 years were directly attributable to cigarette smoking by mothers during pregnancy or infancy (Figure 10).

**Figure 10** Estimated percentage of all deaths in Queensland directly attributable to cigarette smoking between 1992 and 1996 by age group



Data source: Health Information Centre, Queensland Health  
COPD: Chronic obstructive pulmonary disease

### Morbidity and costs

During 1995/96 and 1996/97 27,801 hospital separations were estimated to be directly attributable to cigarette smoking (3% of all separations). The comparatively low proportion of separations (3%) compared to deaths (15%) due to smoking may be due to the very high contribution of injuries to hospital

separations. Males accounted for 67% of these hospital separations. Of the hospital separations which were directly attributable to smoking, the most common principal diagnoses were ischaemic heart disease (23%), chronic obstructive pulmonary disease (18%) and lung cancer (9%).

It is estimated that 187,538 occupied bed days were directly attributable to cigarette smoking in the financial year 1996/97, at a cost to Queenslanders of \$108.8 million. The average length of stay for smoking related illnesses in 1996/97 was 6.7 days, compared to an average length of stay for all hospital separations of 3.9 days.

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## METHODOLOGY

### Smoking prevalence

Smoking prevalence estimates were obtained from National and State-based surveys.

The 1995 National Health Survey (1995 NHS) was conducted by the Australian Bureau of Statistics during 1995 (ABS, 1996b). Each member of selected households was personally interviewed regarding a wide range of health issues and medical conditions. A total of 53,828 interviews was obtained. Only adults aged 18 years and over (n=39,100) were asked questions about current smoking status. A similar survey was conducted in 1989/90.

The National Aboriginal and Torres Strait Islander Survey was the first nation-wide survey of Aboriginal and Torres Strait Islander people conducted by the Australian Bureau of Statistics in 1994 (ABS 1996a). Residents of all dwellings in which Aboriginal or Torres Strait Islander people lived within randomly selected collection districts were interviewed by Indigenous

interviewers. Information was collected from 18,753 people.

The Statewide Health Survey was conducted from April to July 1998 using a computer assisted telephone interviewing (CATI) methodology. A total of 5,594 adult residents from private households from across Queensland was surveyed, achieving a response rate of 72%. To evaluate data from the Statewide Health Survey by an individual's socio-economic status, an index was derived by Queensland Health (the Socio-Economic Score for Individuals or SEDI). The derivation of this index utilised part of the methodology used by the Australian Bureau of Statistics for its SEIFA index, however the two scales are not directly comparable. Further information about the Statewide Health Survey and the SEDI index is available on request from the Health Information Centre, Queensland Health.

The Regional Health Survey was conducted during March to October 1993 using CATI methodology. In total 10,453 adult residents from private households were interviewed from 13 Queensland Health Regions achieving a Regional response rate ranging from 75% to 88%. Further information about the Regional Health Survey is available from the Health Information Centre, Queensland Health.

Surveys of smoking among Year 7 to 12 students have been conducted in each state using the same core questions every three years since 1984. In 1996, 92 government and non-government schools in Queensland were randomly selected to be surveyed and a total of 3,634 students participated in the survey. The surveys in Queensland were conducted by the Centre for Health Promotion and Cancer Prevention Research, University of Queensland (see Lowe et al., 1997 for further details).

To give a guide to the accuracy of prevalence estimates, 95% confidence intervals were calculated using tables of standard errors which were developed for each particular survey. In order to compare total population prevalence from the Regional Health Survey 1993 and the Statewide Health Survey 1998, the age-specific rates were directly standardised to the Queensland estimated resident population in 1996 (data obtained from the Australian Bureau of Statistics). A hospital separation is the process by which an admitted patient completes an episode of care. A

separation may be formal or statistical. Formal separation is the administrative process by which a hospital records the completion of treatment and/or care and accommodation of an admitted patient. This generally occurs when a patient is discharged, is transferred to another institution, absconds, or dies whilst in care. Statistical separation on type of change is the administrative process by which a hospital records the completion of each episode of care occurring within a single hospital stay.

### **The contribution of cigarette smoking to mortality and morbidity in Queensland**

The use of aetiological fractions provides a method for estimating the effects of a particular health risk factor on the mortality or hospital use of a given population. Some 36 conditions have been identified through a comprehensive literature review as being significantly associated with cigarette smoking (English et al., 1995). For each cigarette smoking related condition, an aetiological fraction is provided by five year age group and sex. For example, it is estimated that 85% of lung cancer in males aged between 35 and 39 years of age is directly attributable to cigarette smoking.

The published aetiological fractions for Australia have been applied to Queensland morbidity and mortality data. To decrease the effect of chance variations on numbers of cases, five years of data (1992-1996) were aggregated for analysis of mortality data and two years of data (1995/96 and 1996/97) were aggregated for analysis of hospital morbidity data.