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Head and neck cancers in Australia



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*Authoritative information and statistics
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Head and neck cancers in Australia

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Abbreviations

AACR	Australasian Association of Cancer Registries
AIHW	Australian Institute of Health and Welfare
AR-DRG	Australian Refined Diagnosis Related Groups
HPV	Human papillomavirus
IARC	International Agency for Research on Cancer
ICD	International Classification of Diseases
ICD-10-AM	International Statistical Classification of Diseases and Related Health Problems, 10th Revision, Australian Modification
NIP	National Immunisation Program

1. Summary

Head and neck cancer is a term used to describe a range of cancers that occur in the throat (pharynx and larynx), nose, sinuses and mouth.

This report presents the most recent data available on head and neck cancer incidence, mortality, survival and hospitalisations and also describes risk factors that can contribute to a person developing head and neck cancer.

The report also includes a 'spotlight' section which discusses the human papillomavirus (HPV) and how it contributes to head and neck cancers.

Incidence

The number of head and neck cancers diagnosed in Australia is increasing. From 1982 to 2009, the number of head and neck cancers diagnosed rose from 2,475 to 3,896.

While the number of cases diagnosed is rising, the age-standardised incidence rate for head and neck cancers fell from 19.3 per 100,000 persons in 1982 to 16.8 per 100,000 in 2009. Increases in the overall number of cases diagnosed are occurring, despite decreases in age-standardised incidence rates, because of Australia's increasing and ageing population.

The number of cases diagnosed in 2009 was higher for males than females. Males accounted for 73.8% (2,875) of head and neck cancers compared to 26.2% (1,021) for females.

Mortality

Similar to the number of cases diagnosed, the number of deaths from head and neck cancers rose from 752 in 1982 to 944 in 2011.

The age-standardised mortality rate fell from 6.1 per 100,000 persons in 1982 to 3.8 per 100,000 in 2011. Increases in the overall number of deaths due to head and neck cancers are occurring, despite a drop in the age-standardised mortality rates, because of the growth and ageing of Australia's population.

Males accounted for a higher number of deaths in 2011 than females, with 73.2% (691) of deaths from head and neck cancers among males compared to 26.8% (253) for females.

Survival

Overall survival from head and neck cancers is improving. There was a rise in 5-year relative survival from 61.8% in 1982–1987 to 68.2% in 2006–2010. One-year relative survival for males and females in 2006–2010 were broadly comparable. However, 5-year relative survival for females was higher at 70.4% compared to males at 67.4%.

Hospitalisations

Hospitalisations for head and neck cancers are also rising. In 2011–12, there were 8,478 hospitalisations where head and neck cancer was the principal diagnosis. This was an increase of 13.8% from 2002–03 when there were 7,448 hospitalisations.

The number of hospitalisations for surgery where head and neck cancer was the principal diagnosis also increased over time, from 3,305 in 2002–03 to 3,725 in 2011–12. This was an overall increase of 12.7%.

2. Introduction

This report is one of a series of brief reports being developed under the framework of the National Centre for Monitoring Cancer under the guidance of the Cancer Monitoring Advisory Group.

Other reports planned in the series include:

- Skin cancer
- Cancer and mental health
- Haematological (blood) cancers.

Each report will incorporate a 'spotlight' section which highlights a particular issue associated with a specific cancer or cancer-related topic.

This report, the first in the series, is about head and neck cancers with a spotlight on the human papillomavirus (HPV), and its link with head and neck cancers.

Cancer (also called malignant neoplasm) is a diverse group of diseases characterised by the uncontrolled proliferation of abnormal cells. These abnormal cells invade and damage the tissues around them, and may then spread to other parts of the body, which can cause further damage and eventually death (AIHW 2012).

Cancers are distinguished from each other by the location in the body in which the disease began (known as the site) and/or by the type of cell involved (known as histology). For example, cancer that begins in the lung is called lung cancer, regardless of whether or not it has spread to other sites. The original site in which a cancerous tumour is formed is referred to as the primary cancer. The spread of cancerous cells from the primary cancer site to another (that is, secondary) site is referred to as metastasis (see Glossary) (AIHW 2012).

The term 'head and neck cancer' does not refer to a single type of cancer – it is a term used to describe a range of malignant (cancerous) tumours that can appear in or around the throat (pharynx and larynx), nose, sinuses and mouth (NCI 2013).

There are 18 different cancer sites categorised as head and neck cancers according to the International Classification of Diseases (ICD-10) (see Appendix A).

This report presents these cancers in the following 5 head and neck cancer groups:

- Oral cavity
- Salivary glands
- Pharynx
- Nasal cavity and paranasal sinus
- Larynx (see Figure 2.1).

Head and neck cancers also include a sixth group, 'ill-defined sites in the lip, oral cavity and pharynx'. Totals of all head and neck cancers discussed in this report include this group but it is not presented separately.

The glossary provides definitions of what is included in each of the 5 head and neck cancer groups.

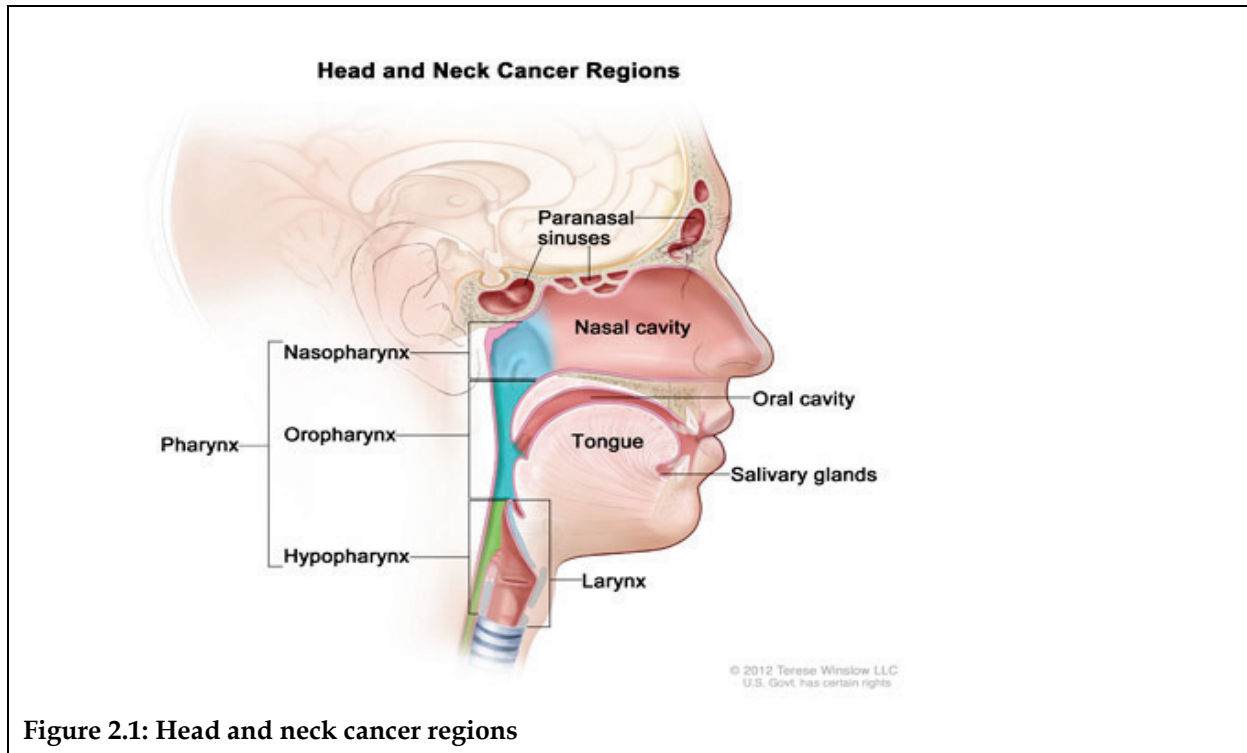


Figure 2.1: Head and neck cancer regions

This report presents the latest available data on head and neck cancers, comprising:

- Incidence data 2009
- Mortality data 2011
- Survival data 2006–2010
- Hospitalisations data 2011–12.

3. Facts about head and neck cancers

There are 18 different cancer sites categorised as head and neck cancers. Cancers that are known collectively as head and neck cancers usually begin in the squamous cells (the uppermost skin cells) that line the moist, mucosal surfaces inside the head and neck (NCI 2013). It is not uncommon that a patient may have multiple cancers in different regions of the head and neck.

Dental practitioners, as well as general practitioners, often diagnose head and neck cancers.

Males account for a much higher proportion of diagnosed head and neck cancers compared with females.

Head and neck cancers are often associated with lifestyle risk factors. Factors that can increase an individual's risk of developing head and neck cancers include:

- genetic predisposition
- behaviour – such as smoking, excess alcohol consumption, diet and physical inactivity
- obesity
- environmental and occupational hazards (Langevin et al. 2013).

Also, viruses, such as Epstein-Barr virus and Cytomegalovirus, have links to head and neck cancers (Paradise et al. 2013).

Additionally, high risk types of human papillomavirus (HPV), including HPV-16, can increase the risk of developing some head and neck cancers (Gillison et al. 2008; Kreimer et al. 2013).

HPV and its link to head and neck cancers is discussed in more detail in the 'spotlight' section.

Risk factors

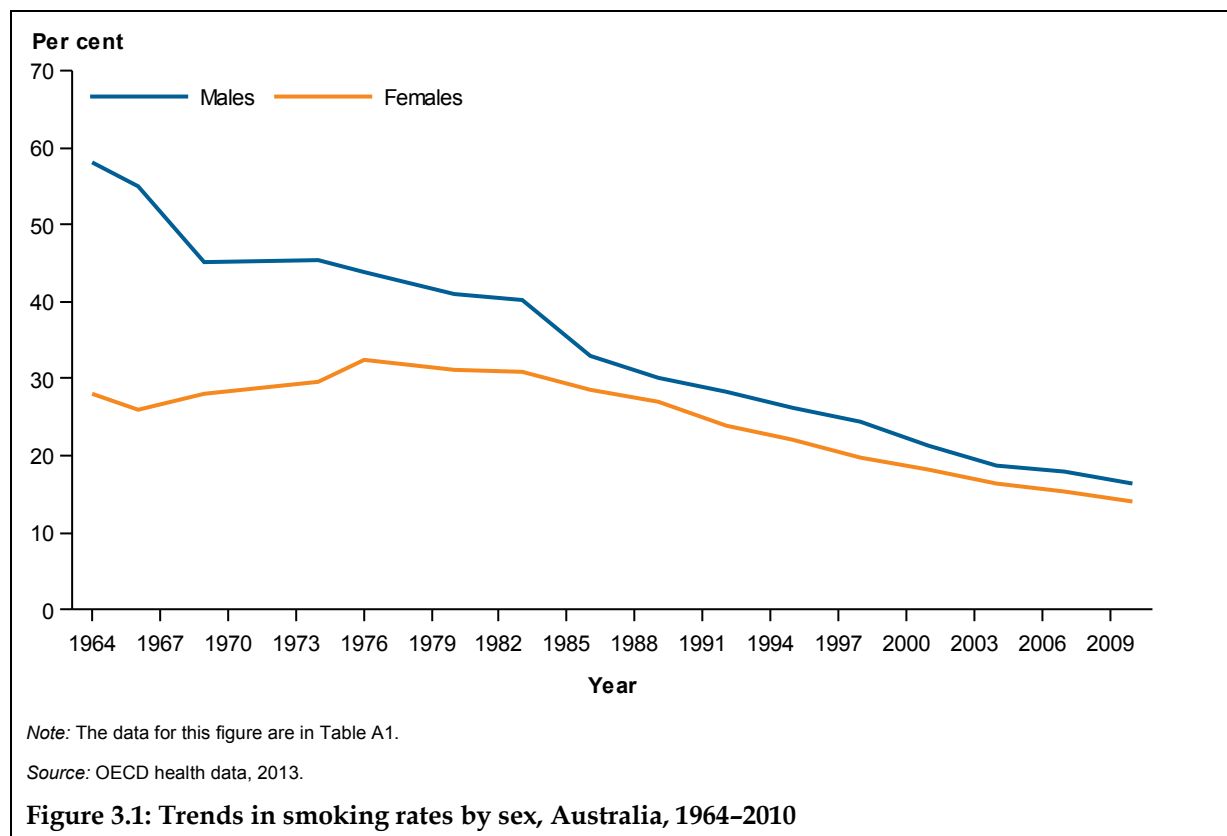


Tobacco use

Smoking is a major risk factor for some head and neck cancers, particularly the larynx, oral cavity, oropharynx and hypopharynx (NCI 2013).

In 1985, a working group under the International Agency for Research on Cancer (IARC) recognised a causal link between tobacco smoking and cancers including oral cavity, pharynx and larynx. Seventeen years later, the IARC added cancers of the nasal cavities and nasal sinuses to the list of smoking-related head and neck cancers (Gandini et al. 2008).

The percentage of males aged 14 years or older in Australia who were daily smokers decreased steadily from 58% in 1964 to 16.4% in 2010. For females aged 14 years or older, the percentage of daily smokers increased from 28% in 1964, peaking at 32.5% in 1976 before falling to 13.9% in 2010 (Figure 3.1).



Tobacco has been identified as a major carcinogenic factor in the overwhelming majority of squamous cell carcinomas in the head and neck (Sturgis et al. 2004). The risk for squamous cell cancer of the head and neck is estimated to be approximately 10-fold greater for current smokers compared with never-smokers. This risk decreases with time from the cessation of exposure, although the risk never reduces to the level of a never-smoker (Schlecht et al. 1999).

Both smoking (cigarettes, cigars, and pipes) and ‘smokeless’ tobacco (snuff and chewing tobacco) increase the risk of developing oral cancer (Ko et al. 1995; Rodu & Jansson 2004).

As tobacco use is a major risk factor for some head and neck cancers, trends in the incidence of head and neck cancers are likely to follow smoking trends, noting the lag in time between smoking and the onset of cancer.



Alcohol consumption

There is strong scientific evidence that alcohol increases the risk of mouth and throat cancer. The World Cancer Research Fund recommendation is not to drink alcoholic drinks. The National Health and Medical Research Council guidelines recommend that healthy men and women not drink more than two standard drinks on any day. This reduces the risk of alcohol-related harm over a lifetime (NHMRC 2014).

Studies have shown that heavy consumption of alcohol is associated with nutrient deficiency, which appears to contribute independently to some head and neck cancers. Alcohol consumption and smoking can also have a synergistic effect on cancer risk, meaning the combined effects are significantly greater than individual risks added together (Reidy et al. 2011).

At least 75% of head and neck cancers are attributable to a combination of cigarette smoking and alcohol drinking (Hashibe et al. 2007). In 2010, 38% of Australians aged 14 years or older who were current smokers also consumed alcohol at risky levels (more than 2 standard drinks a day on average), compared to only 12% of people who had never smoked (AIHW analysis of the 2010 NDSHS).



Sun exposure

Australia has one of the highest rates of skin cancer of any country in the world (Montague et al. 2001). Exposure to the sun can cause head and neck cancer, particularly cancer of the lip.



Diet

Gastroesophageal reflux – acid from the stomach travelling up into the oesophagus increases your risk of developing oesophageal cancer (WCRF 2012).

Studies suggest an association with certain foods including salted fish and some preserved foods and hot spices. The carcinogenic potential of salt-preserved food can be explained by the accumulation of significant levels of nitrosamines, which are known for their carcinogenic properties (Tabuchi et al. 2011).

Diet can contribute to oropharyngeal cancer. A higher quantity intake of fruits and vegetables is also associated with reduced incidence of oesophageal squamous carcinoma and adenocarcinoma (Holmes & Vaughan 2007).



Family history and genetic susceptibility

Genetic predisposition and family history (for example, a first-degree relative having head and neck cancer) may play a role in head and neck cancer (Negri et al. 2009). A first-degree relative is a family member who shares about 50 per cent of their genes with a particular individual in a family (mother, father, sister, brother, daughter, son).

Numerous studies have been conducted to investigate genetic mechanisms in cancer causes and pathogenesis. Some studies suggest slight differences in certain gene segments make some individuals more prone to developing cancer, which is known as 'genetic susceptibility' (Zavras & Yoon 2013).

For example, nasopharyngeal carcinoma is quite rare in most populations, but it is a leading form of cancer in a few well-defined populations, including natives of southern China, south-east Asia, the Arctic, and the Middle East/north Africa (Chang & Adami 2006).



Obesity and physical inactivity

Evidence suggests that modifications to a number of lifestyle factors, including physical exercise and weight loss, have the potential to reduce head and neck cancer incidence (WCRF/AICR 2007).



Environmental and occupational exposures

Environmental and occupational factors including asbestos, wood dust and leather dust can also contribute to some head and neck cancers, including in the larynx and pharynx (Langevin et al. 2013).



Viruses

The human papillomavirus (HPV) has been recognised as contributing to some cancers of the head and neck. The high-risk HPVs have been linked to cancers affecting oral cavity and pharynx (the area at the back of the throat).

Also, viruses, such as Epstein-Barr virus and Cytomegalovirus have links to head and neck cancers (Paradise et al. 2013).

4. Incidence of head and neck cancers

Head and neck cancer incidence refers to the *number of new cases* of head and neck cancers diagnosed during a specific period, usually 1 year. It does not refer to the *number of people* newly diagnosed (because 1 person can be diagnosed with more than 1 head or neck cancer in a year), although the 2 numbers are likely to be similar.

Head and neck cancer incidence data come from the Australian Cancer Database, which contains information on Australians diagnosed with primary, invasive cancer (excluding basal cell and squamous cell carcinomas of the skin) since 1982.

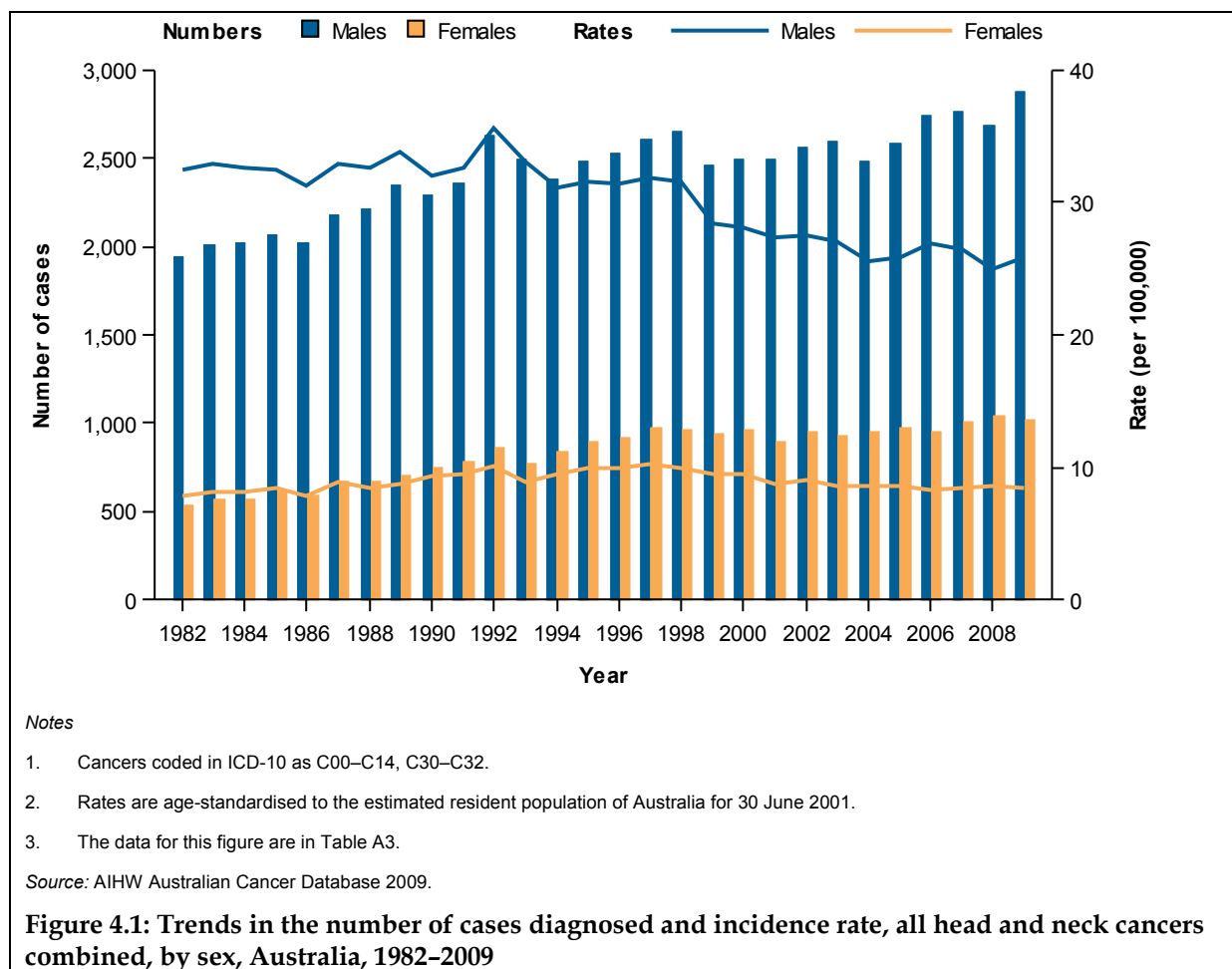
Incidence of head and neck cancers combined

Number of new cases diagnosed

- The total number of head and neck cancers diagnosed in 2009 was 3,896, accounting for 3.4% of all cancers diagnosed (114,137).
- Males accounted for a much higher proportion of head and neck cancers, accounting for 73.8% of new cases diagnosed in 2009.
- From 1982 to 2009, the number of head and neck cancers diagnosed generally increased from 2,475 (1,943 males and 532 females) to 3,896 (2,875 males and 1,021 females) (Table A2 and A3).

Incidence rates

- From 1982 to 2009, the age-standardised incidence rate for head and neck cancers in all persons (males and females combined) decreased from 19.3 per 100,000 persons to 16.8 per 100,000 persons.
- This decrease was mainly due to a reduction in the incidence rate for males from 32.4 per 100,000 in 1982 to 25.9 per 100,000 in 2009.
- In females, the incidence rate from 1982 to 2009 remained relatively stable at around 8 per 100,000 (Figure 4.1).



Incidence of head and neck cancer groups

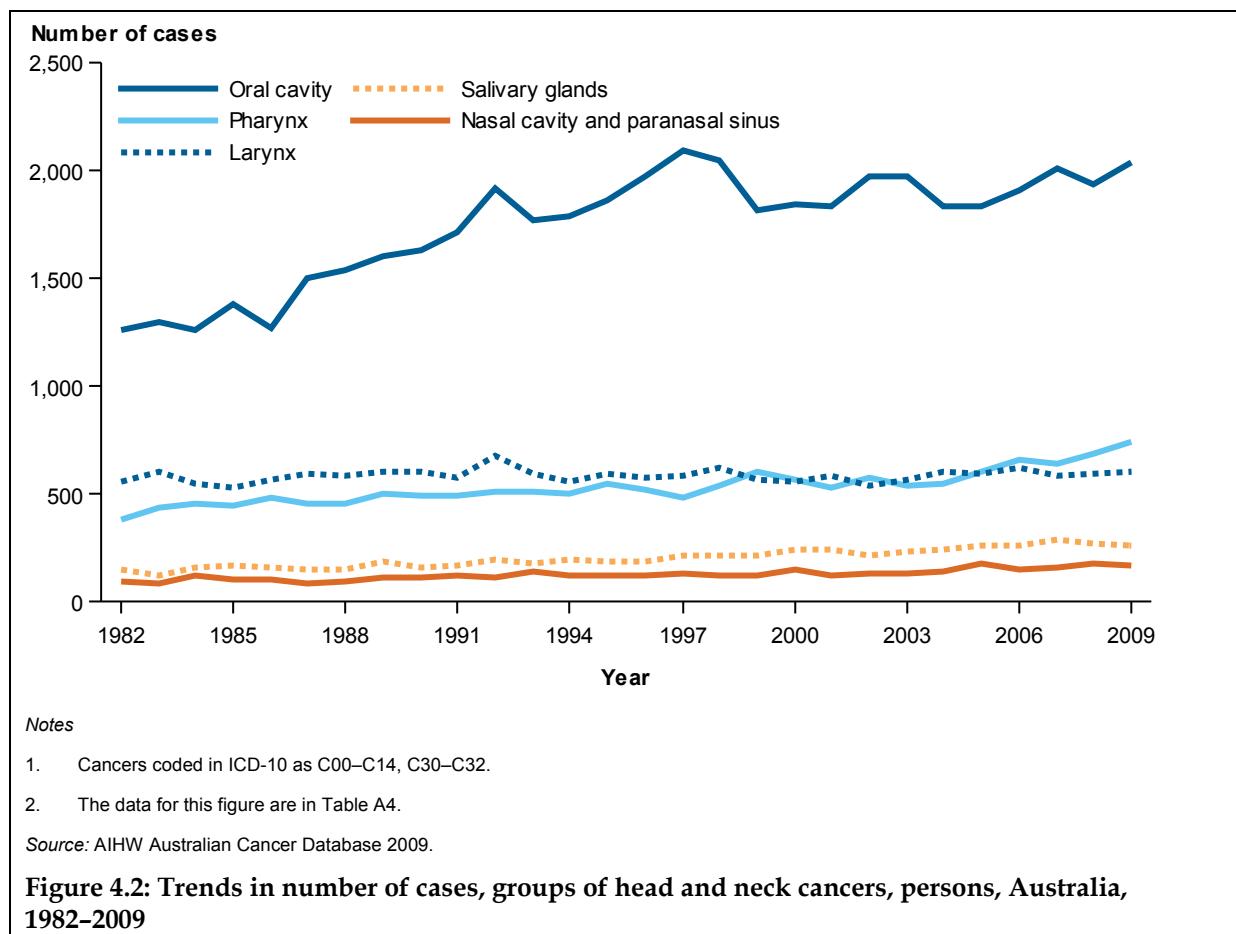
In 2009, the number of new cancer cases for each of the head and neck cancer groups were:

- Oral cavity with 2,037. This was 52.3% of all new cancers diagnosed in 2009
- Pharynx with 739 (19.0%)
- Larynx with 606 (15.6%)
- Salivary glands with 265 (6.8%)
- Nasal cavity and paranasal sinus with 166 (4.3%).

Males accounted for at least 60% of new cases in each head and neck group in 2009.

From 1982 to 2009, the number of new cases diagnosed for head and neck cancer groups increased by varying degrees:

- Oral cavity from 1,263 to 2,037
- Pharynx from 378 to 739
- Larynx from 553 to 606
- Salivary glands from 152 to 265
- Nasal cavity and paranasal sinus from 96 to 166 (Figure 4.2).



Internationally, according to the World Health Organization, oral cancers are more common in parts of the world where betel quid is chewed. Of the 390,000 oral and oropharyngeal cancers estimated to occur annually in the world, 228,000 (58%) occur in south and south-east Asia. Evidence in Taiwan and China, where the incidence of oral cancer in men has tripled since the early 1980s, coincides with the practice of chewing betel quid (WHO 2003).

Nasopharyngeal cancer (a cancer included in the Pharynx group) is distinctive due to its peculiar epidemiological and biological characteristics. Nasopharyngeal cancer is a rare cancer in most parts of the world, but occurs at a high rate in south-east Asia (Wang et al. 2012).

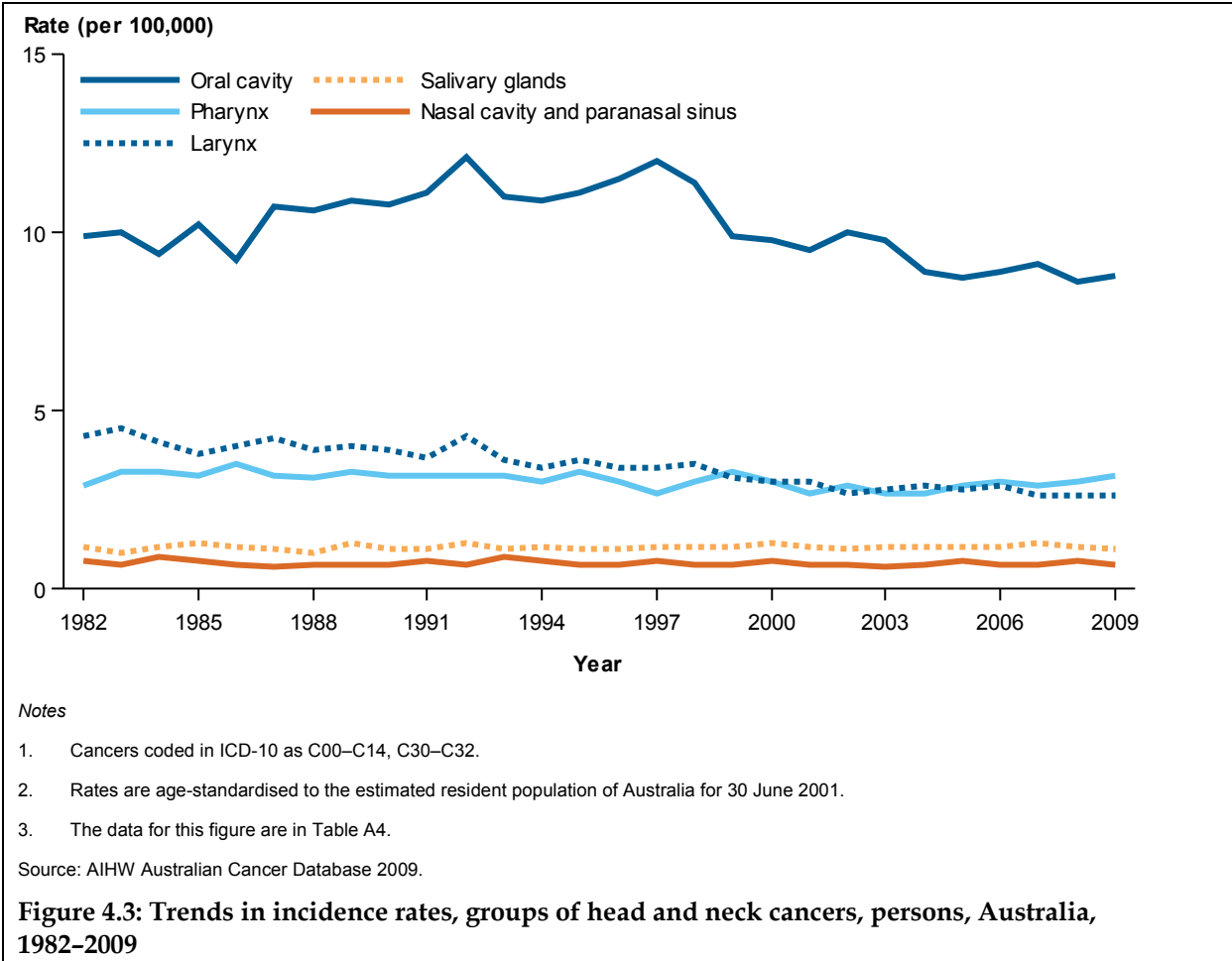
Incidence rates of nasopharyngeal are highest in south-eastern Asia (Jemal et al. 2011). The distinctive racial/ethnic and geographic distribution of nasopharyngeal carcinoma worldwide suggests that both environmental factors and genetic traits contribute to its development (Chang & Adami 2006).

In 2009, a total of 122 nasopharyngeal cancers were diagnosed in Australia. Of these, 45 were diagnosed in people born in north-east Asia or south-east Asia (37%). In comparison, the proportion of Australians who were born in north-east Asia or south-east Asia in 2011 was only 3.25%.

Incidence rates of head and neck cancer groups

After adjusting for changes in the age structure of the population over time, changes in the age-standardised incidence rate varied from year to year for head and neck cancer groups from 1982 to 2009:

- Oral cavity incidence rates generally increased from 9.9 per 100,000 persons in 1982 to 12.1 per 100,000 persons in 1992. The incidence rate then decreased to 8.8 per 100,000 persons in 2009.
- Pharynx rates increased slightly from 2.9 per 100,000 in 1982 to 3.2 per 100,000 in 2009.
- Larynx rates decreased from 4.3 per 100,000 to 2.6 per 100,000.
- Salivary gland rates remained relatively stable at around 1.2 per 100,000.
- Nasal cavity and paranasal sinus rates also remained relatively stable at around 0.8 per 100,000 (Figure 4.3).



The increase in the number of head and neck cancers diagnosed over time can be explained, at least in part, by the increasing size and ageing of the population. Any change in age-standardised incidence rates may reflect alterations to lifestyles and health behaviours such as reduced smoking rates within the population.

The Australian Cancer Database Data Quality Statement can be found at Appendix B.

5. Mortality from head and neck cancers

Mortality refers to the number of deaths for which the underlying cause of death was a head or neck cancer. The head and neck cancer that led to the death of the person may have been diagnosed many years previously, in the same year in which the person died or, in some cases, after death (for example at autopsy). Information on underlying cause of death is derived from the medical certificate for cause of death, which a medical practitioner usually completes.

The mortality data source used in this report is the AIHW National Mortality Database which contains information about all deaths registered in Australia since 1964.

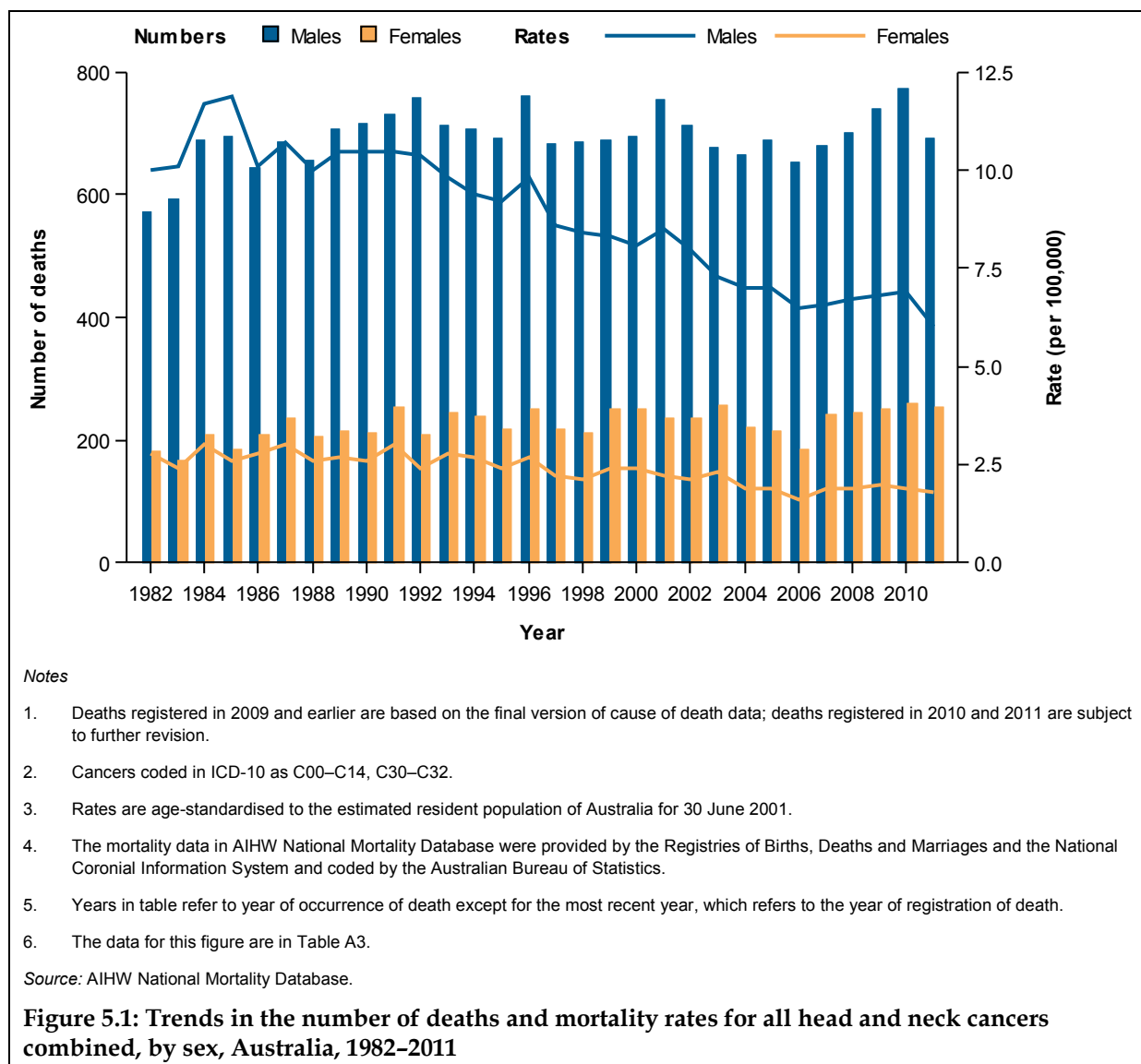
Number of deaths from head and neck cancers combined

Number of deaths

- The total number of deaths from head and neck cancers in 2011 was 944, accounting for 2.2% of all deaths from cancer (43,221).
- Males accounted for a much higher proportion of deaths from head and neck cancers with 691 deaths (73.2%) compared to 253 for females (26.8%) (Figure 5.1).
- From 1982 to 2011, the number of deaths from head and neck cancers trended upwards from 752 (570 males and 182 females) to 944 (691 males and 253 females) (Tables A2 and A3).

Mortality rates

- From 1982 to 2011, the age-standardised mortality rate for head and neck cancers decreased from 6.1 deaths per 100,000 persons to 3.8 deaths per 100,000 persons.
- The decrease in the mortality rate from 1982 to 2011 was more pronounced for males than females, with the mortality rate for males falling from 10.0 deaths per 100,000 persons in 1982 to 6.0 deaths per 100,000 persons in 2011.
- Over the same period, the mortality rate for females dropped from 2.8 deaths per 100,000 persons to 1.8 deaths per 100,000 persons (Figure 5.1).



Number of deaths in head and neck cancer groups

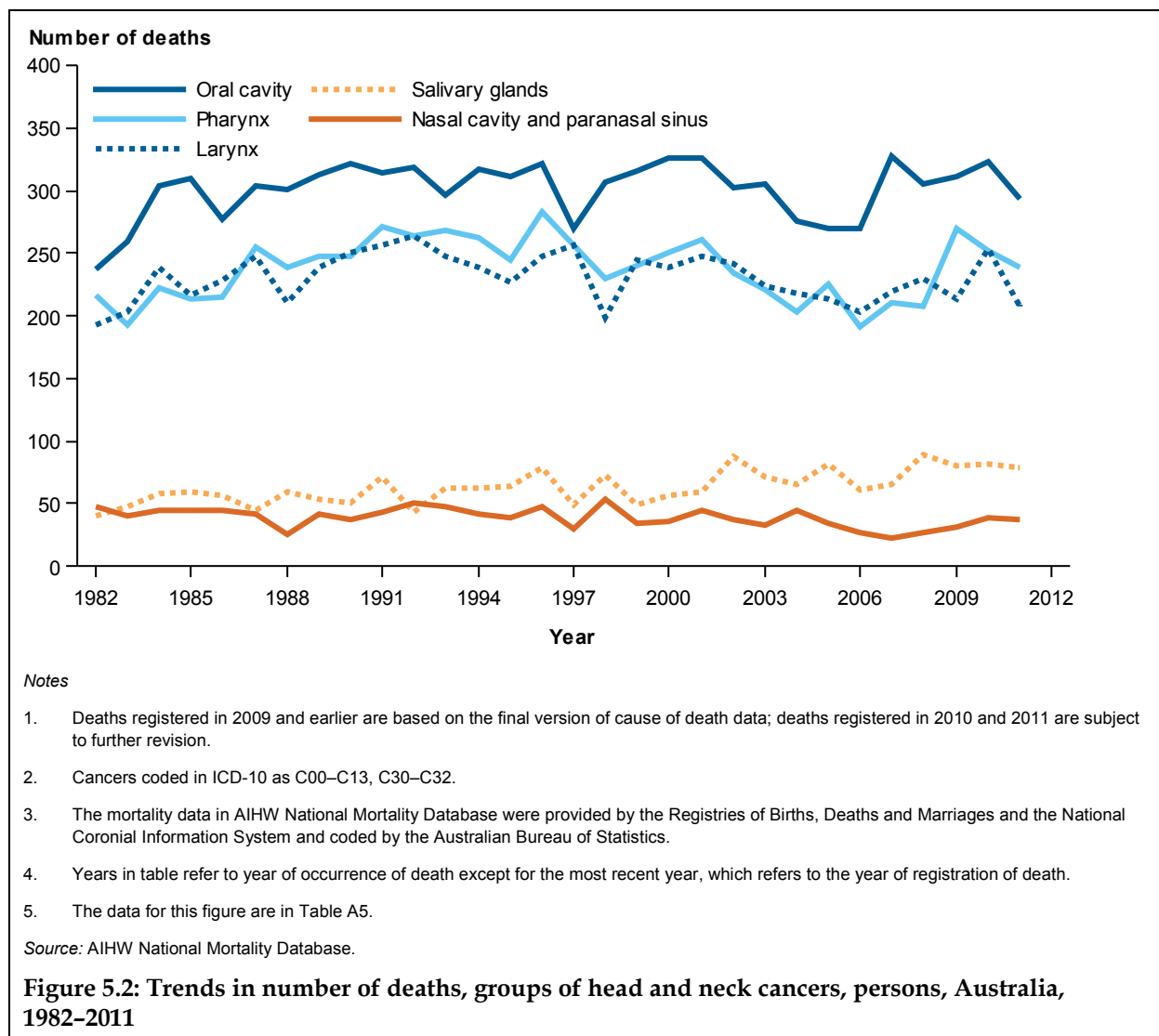
In 2011, the total number of deaths from head and neck cancer was 944. The number of deaths allocated into head and neck cancer groups followed the same order as cancer incidence numbers:

- Oral cavity with 294 (31.1% of all deaths from head and neck cancer)
- Pharynx with 238 (25.2%)
- Larynx with 207 (21.9%)
- Salivary glands with 79 (8.4%)
- Nasal cavity and paranasal sinus with 37 (3.9%).

Males accounted for a much higher proportion of deaths in each of the head and neck cancer groups, accounting for at least 61% of deaths for each group in 2011.

From 1982 to 2011, the number of deaths for each head and neck cancer group increased except for nasal cavity and paranasal sinus which decreased:

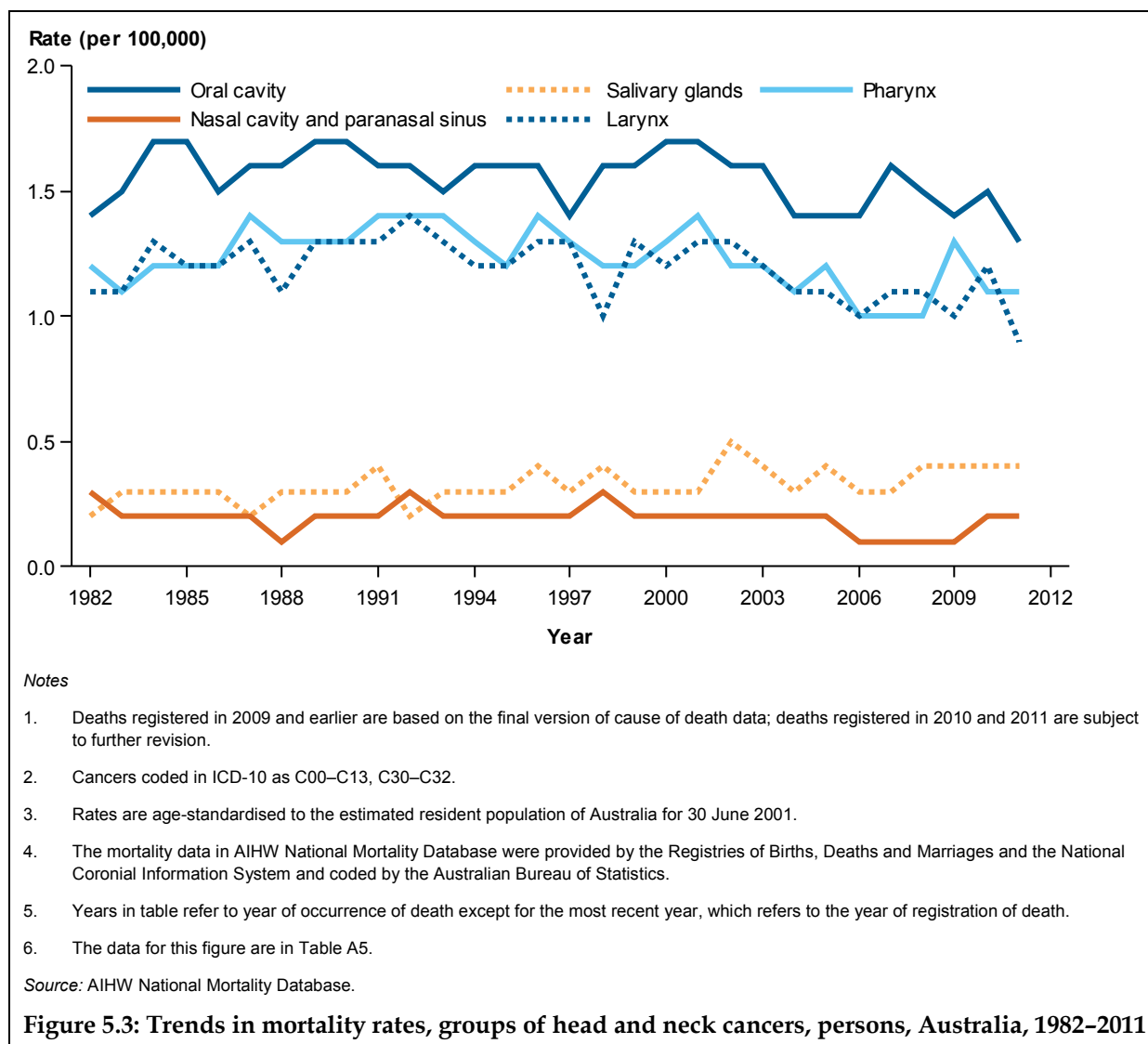
- Oral cavity increased from 237 deaths in 1982 to 294 deaths in 2011
- Pharynx increased from 217 deaths to 238 deaths
- Larynx increased from 192 deaths to 207 deaths
- Salivary glands increased from 40 deaths to 79 deaths
- Nasal cavity and paranasal sinus decreased from 47 deaths to 37 deaths (Figure 5.2).



Mortality rates for head and neck cancer groups

From 1982 to 2011, mortality rates for head and neck cancer groups remained relatively stable over time:

- Oral cavity at around 1.5 deaths per 100,000 persons
- Pharynx at around 1.2 deaths per 100,000
- Larynx at around 1.2 deaths per 100,000
- Salivary glands at around 0.3 deaths per 100,000
- Nasal cavity and paranasal sinus at around 0.2 deaths per 100,000 (Figure 5.3).



The data quality statements underpinning the National Mortality Database can be found in quality declaration summaries in the following ABS catalogues:

<<http://www.abs.gov.au/AUSSTATS/abs@.nsf/mf/3303.0/>>

<<http://www.abs.gov.au/ausstats/abs@.nsf/mf/3302.0>>.

6. Survival from head and neck cancers

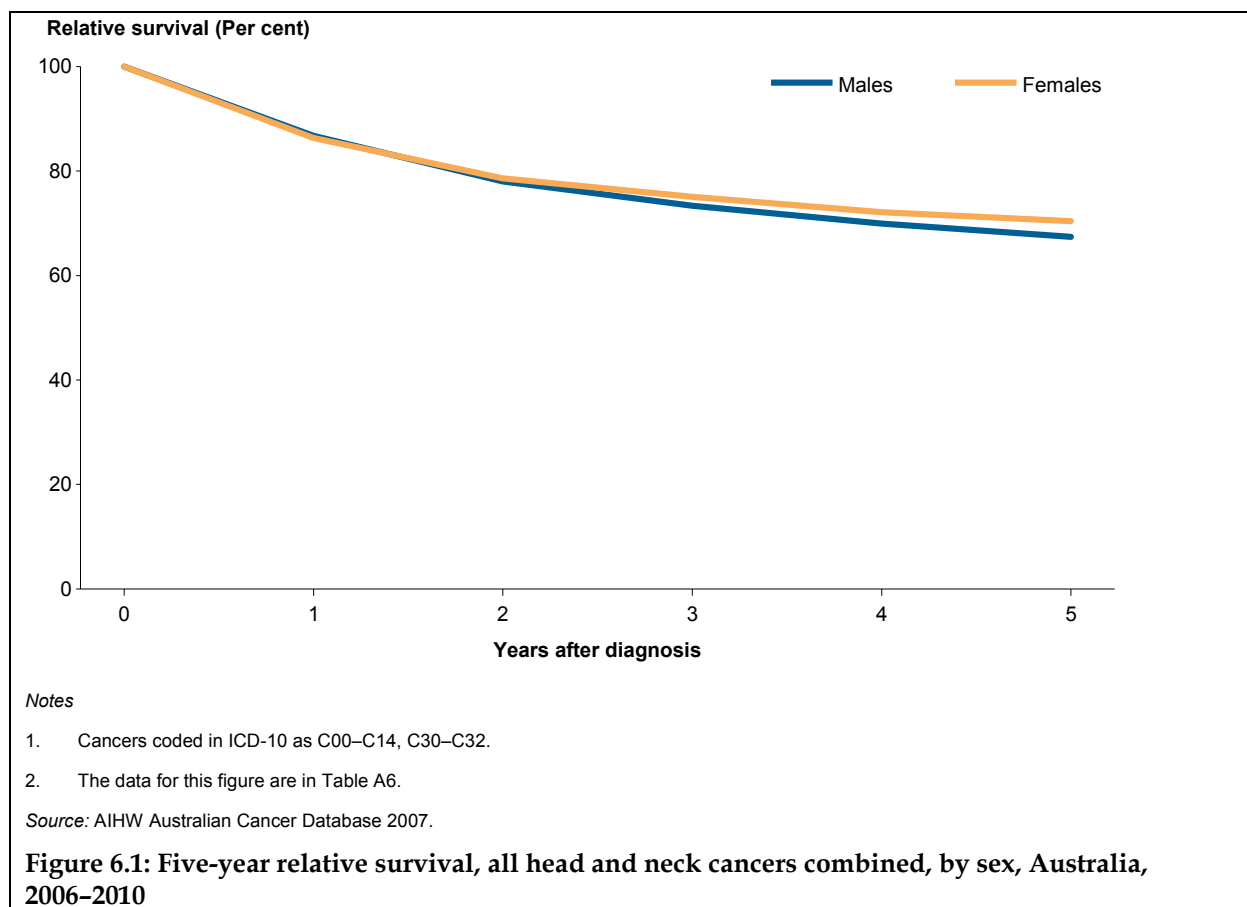
Information about survival from cancer provides an indication of cancer prognosis and the effectiveness of the treatments available. A range of factors influence survival from cancer including the demographic characteristics of the patient (such as age, sex and genetics), the nature of the tumour (such as site, stage at diagnosis and histology type) and the health-care system (such as the availability of health-care services, diagnostic and treatment facilities, and follow-up services).

Survival in this report refers to 'relative survival' that is, all survival probabilities presented are relative to those of the general population. It refers to the probability of being alive for a given amount of time after diagnosis compared to those of the general population, and reflects the impact of a cancer diagnosis.

Survival for head and neck cancers combined

In 2006–2010, 5-year relative survival was 68.2% for all head and neck cancers combined. This means that people diagnosed with these cancers had a 68.2% chance of surviving for at least 5 years compared with the general population. This is an increase from 1982–1987 when 5-year relative survival for head and neck cancers was 61.8%.

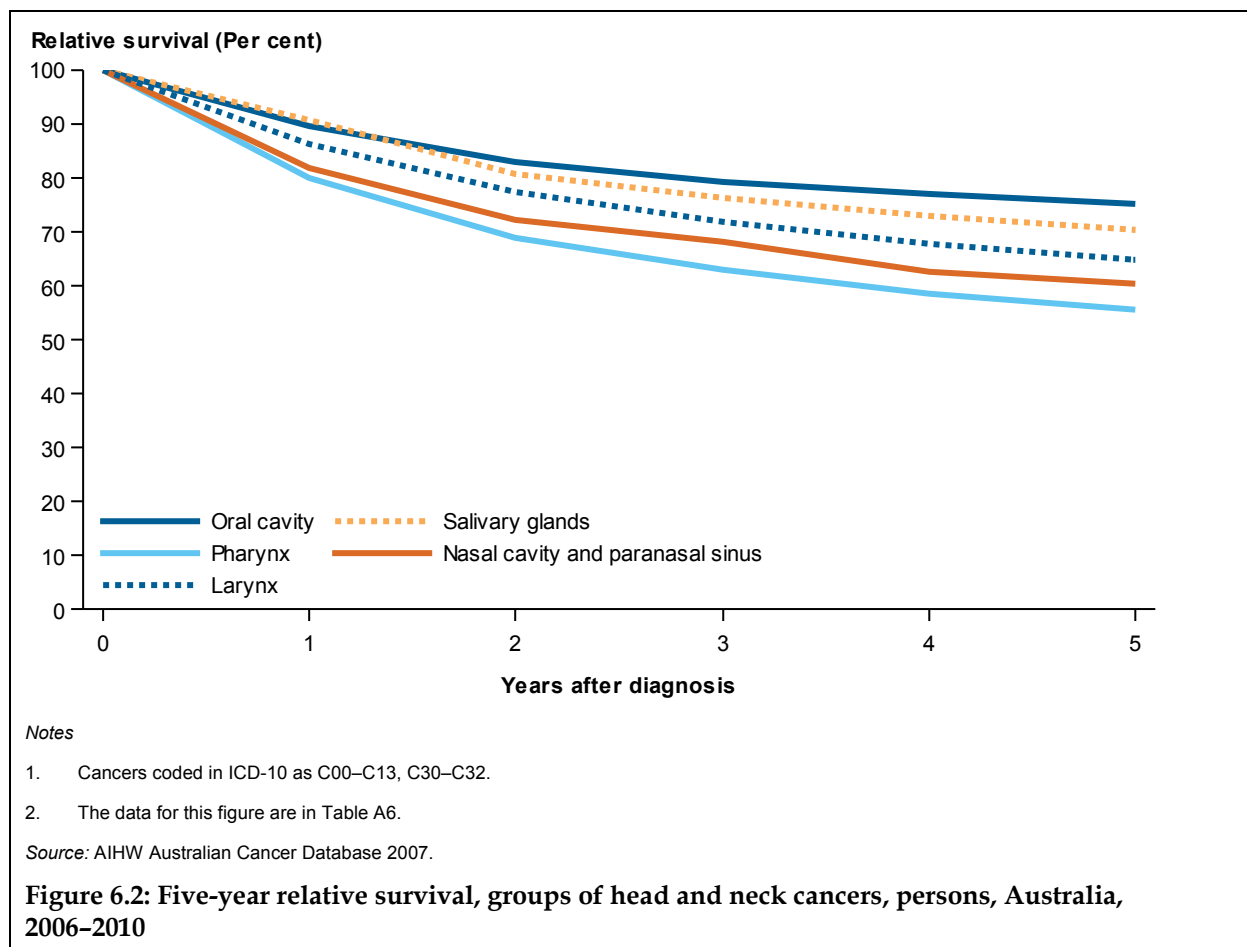
Females had slightly lower 1-year relative survival than males (86.3% for females and 86.7% for males) but higher 5-year survival than males, at 70.4% compared with 67.4% for males (Figure 6.1).



Survival for head and neck cancer groups

In 2006–2010, 5-year relative survival was highest for oral cavity cancer. 5-year relative survival for all head and neck cancer groups was:

- Oral cavity at 75.0% (75.6% males and 73.8% females)
 - Pharynx at 55.5% (54.8% for males and 58.2% for females)
 - Larynx at 64.8% (64.8% for males and 64.1% for females)
 - Salivary glands at 70.4% (64.0% for males and 79.6% for females)
 - Nasal cavity and paranasal sinus at 60.3% (61.2% for males and 58.6% for females)
- (Figure 6.2).



7. Hospitalisations for head and neck cancers

The extent of hospitalisation for cancer is one key measure of the burden of cancer on the Australian population. The number of hospitalisations for head and neck cancers in any 1 year is related not only to the number of people with head and neck cancers, but also the number of head and neck cancer-related health services requiring admission to hospital.

In this report, head and neck cancer-related hospitalisations are defined as those where:

- the principal diagnosis (the diagnosis that is chiefly responsible for the episode of care) is a head and neck cancer (see Appendix A)
- the principal diagnosis is related to the treatment or management of cancer, and head and neck cancer is recorded as an additional diagnosis for that hospitalisation.

The principal and additional diagnoses are coded using the *International statistical classifications of disease and related health problems, tenth revision, Australian modification* (ICD-10-AM), 7th edition.

The principal diagnosis is usually a disease but can also be a specific treatment of an already diagnosed condition such as chemotherapy or radiotherapy for cancer. Where a treatment is recorded as the principal diagnosis, the disease being treated is usually recorded as an additional diagnosis (NCCH 2010).

An additional diagnosis is a condition or complaint that either coexists with the principal diagnosis or arises during the episode of care. An additional diagnosis is reported if the condition affects patient care (AIHW 2013a).

A hospitalisation is classified as same-day when a patient is admitted and separates (that is, completes an episode of care either by being discharged, dying, transferring to another hospital or changing type of care) on the same date. A hospitalisation is classified as overnight when a patient is admitted to and separated from the hospital on different dates.

Box 1: Interpreting data on cancer hospitalisations

The number and rate of head and neck cancer-related chemotherapy procedures may be an under-count of actual procedures, due to the admission practices of public hospitals in New South Wales, South Australia and the Australian Capital Territory.

These hospitals provide same-day chemotherapy for outpatients on a non-admitted basis. This means that patients who receive same-day chemotherapy treatment for head and neck cancers in those hospitals are usually not recorded in the AIHW National Hospital Morbidity Database.

For more information about the AIHW National Hospital Morbidity Database, see the National Hospital Morbidity Database data quality statement: 2011–12
<<http://meteor.aihw.gov.au/content/index.phtml/itemId/529483>>.

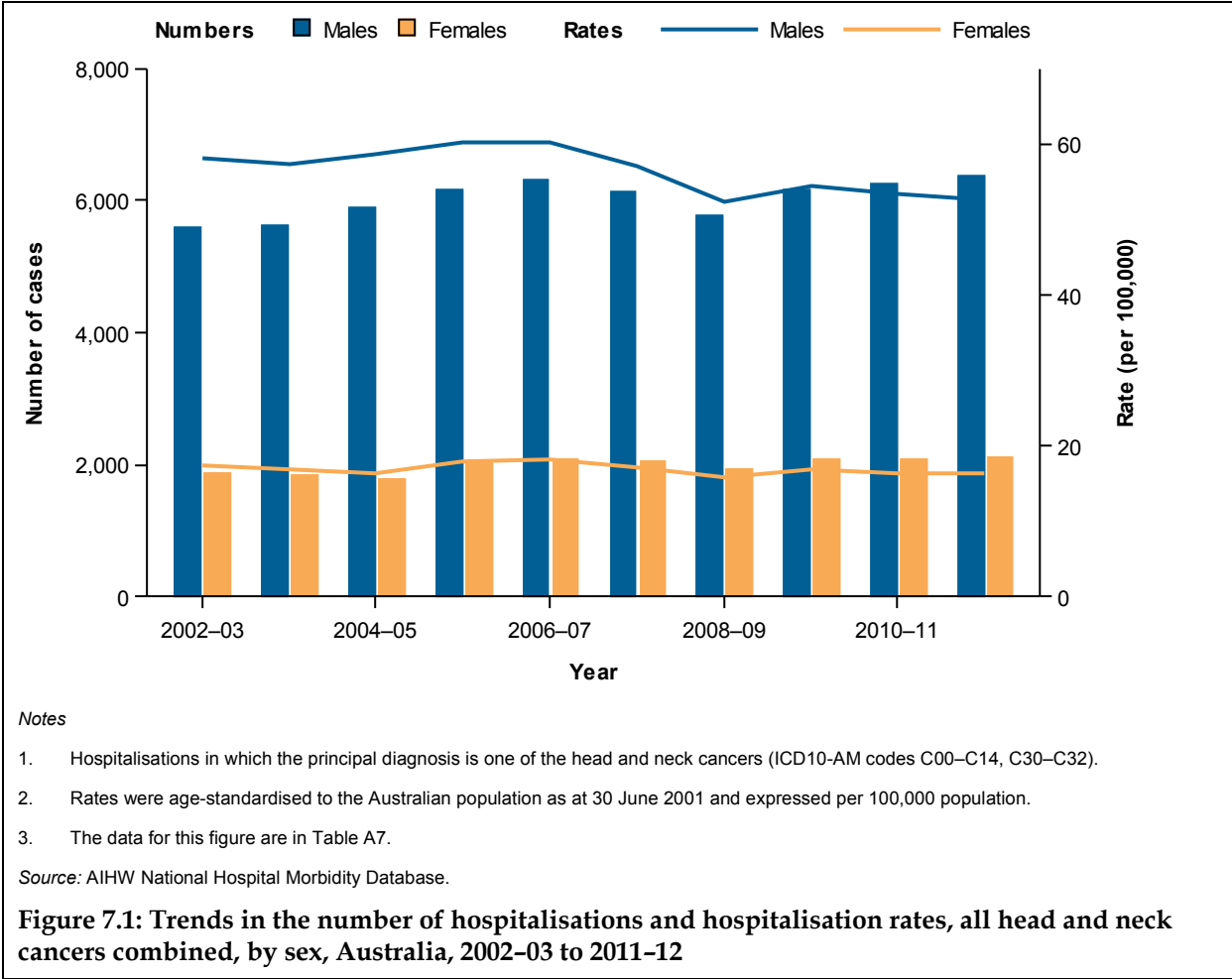
Hospitalisations for head and neck cancers combined

In 2011-12, the total number of head and neck cancer-related hospitalisations was 12,609. This was 1.4% of all cancer-related hospitalisations (908,034). During these head and neck cancer-related hospitalisations, 37,747 procedures were performed.

In 2011-12, there were 8,478 hospitalisations where head and neck cancer was the principal diagnosis. This was an increase of 13.8% from 2002-03 where there were 7,448 head and neck cancer hospitalisations.

In 2011-12, males accounted for a much higher proportion of hospitalisations with a principal diagnosis of head and neck cancer with 6,362 hospitalisations (75.0%) compared to females at 2,116 (25.0%).

The age-standardised hospitalisation rate where head and neck cancer was the principal diagnosis changed from 37.1 per 100,000 in 2002-03 to 33.9 per 100,000 in 2011-12. Over the same period, the age-standardised rate for males changed from 58.3 per 100,000 to 52.7 per 100,000. For females the age-standardised rate changed from 17.5 per 100,000 to 16.2 per 100,000 (Figure 7.1).



Hospitalisations for head and neck cancer groups

Of the 5 head and neck cancer groups, oral cavity accounted for the highest number of hospitalisations where head and neck cancer was the principal diagnosis in 2011–12:

- Oral cavity at 3,659. This was 43.2% of hospitalisations for head and neck cancer.
- Pharynx at 2,073 (24.5%)
- Larynx at 1,512 (17.8%)
- Salivary glands at 608 (7.2%)
- Nasal cavity and paranasal sinus at 462 (5.4%).

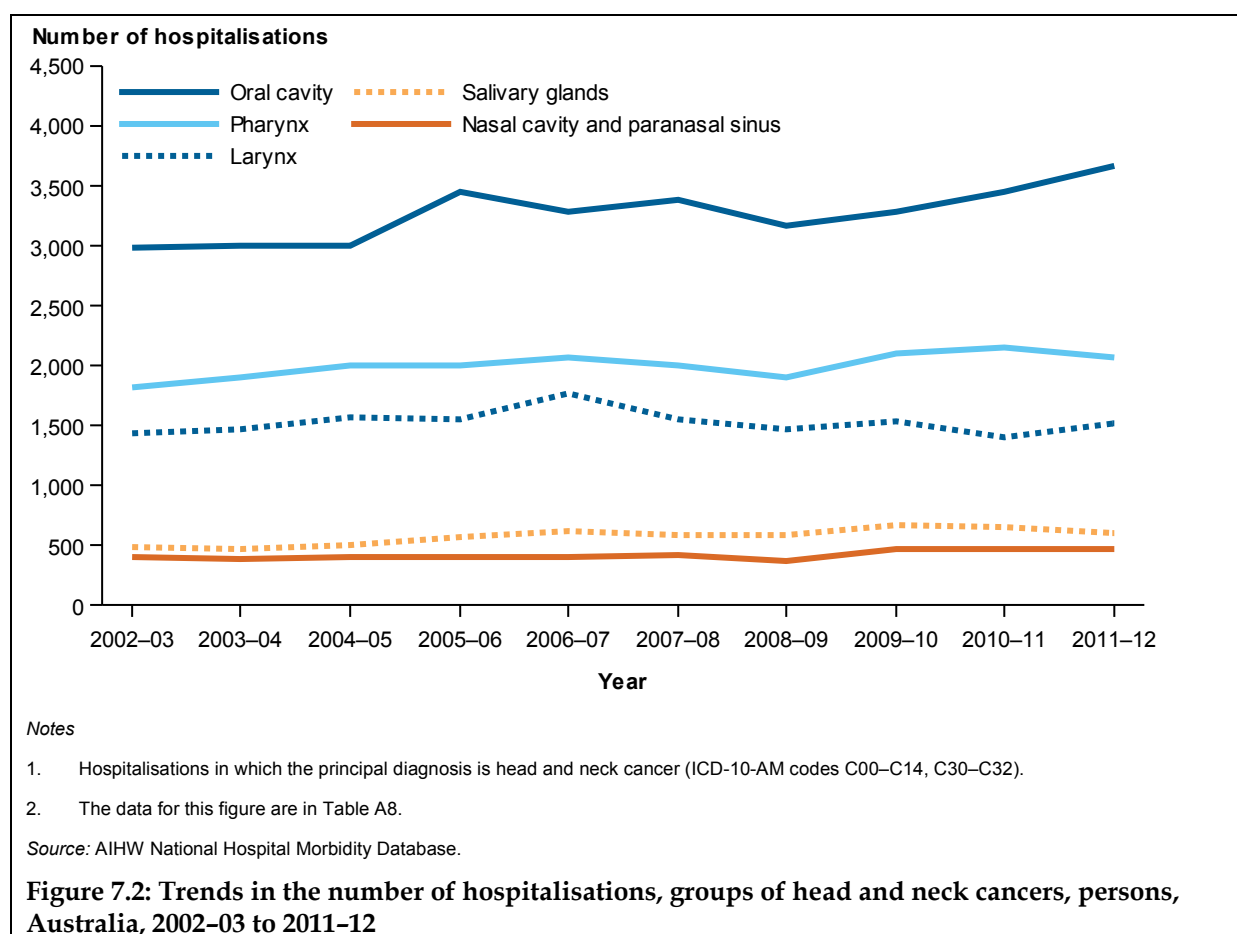
Overnight hospitalisations were higher than same-day hospitalisations for all head and neck cancer groups including:

- Oral cavity with 2,488 overnight hospitalisations and 1,171 same-day hospitalisations
- Pharynx with 1,571 overnight and 502 same-day
- Larynx with 993 overnight and 519 same-day
- Salivary glands with 538 overnight and 70 same-day
- Nasal cavity and paranasal sinus with 352 overnight and 110 same-day.

Males accounted for at least 61% of hospitalisations in each head and neck cancer group in 2011–12.

From 2002–03 to 2011–12, the number of hospitalisations where head and neck cancer was the principal diagnosis increased for each head and neck cancer group :

- Oral cavity increased from 2,979 in 2002–03 to 3,659 in 2011–12
- Pharynx increased from 1,812 to 2,073
- Larynx increased from 1,441 to 1,512
- Salivary glands increased from 487 to 608
- Nasal cavity and paranasal sinus increased from 406 to 462 (Figure 7.2).



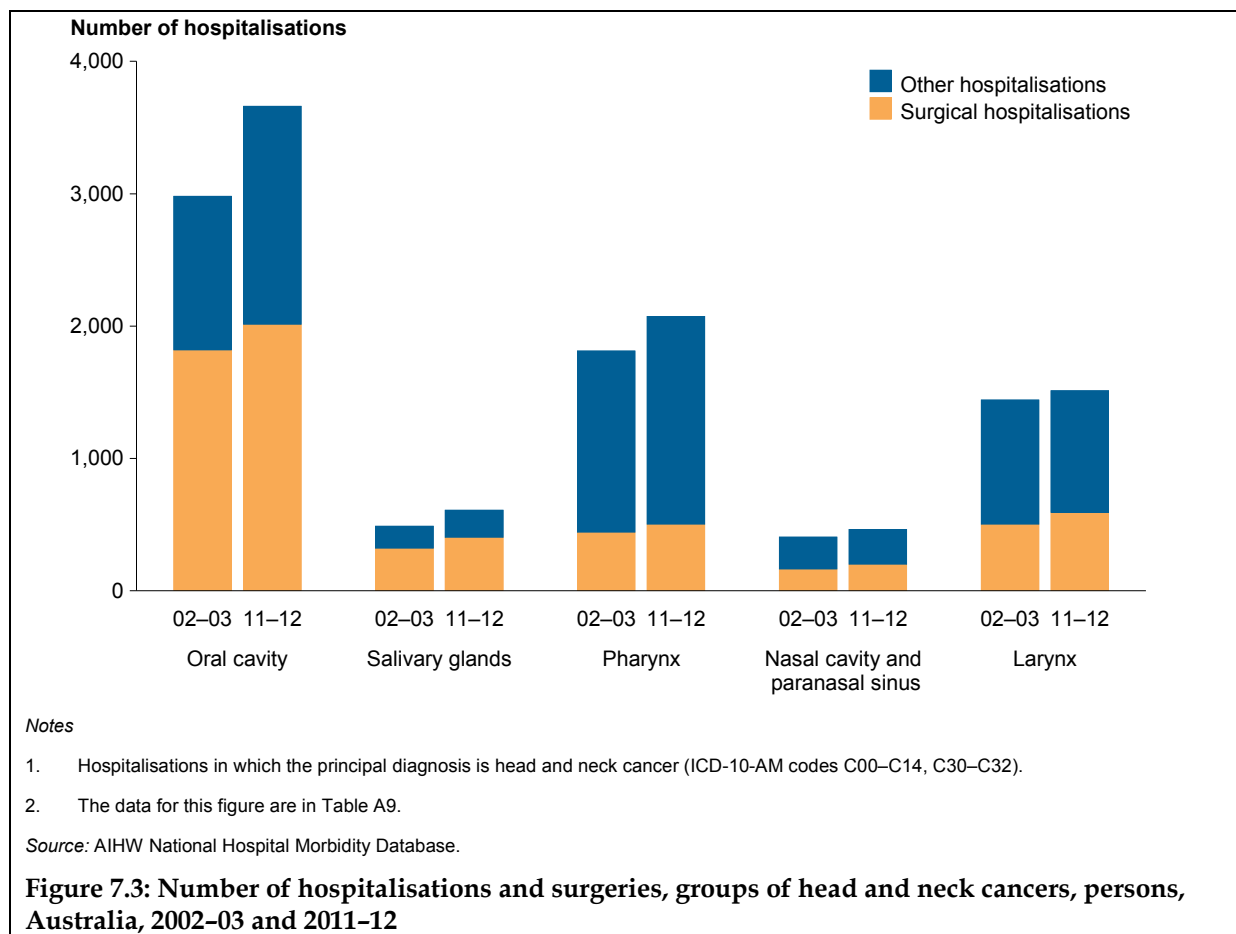
Number of hospitalisations involving surgery

Australian Refined Diagnosis Related Groups (AR-DRG) have been used as a classification system to provide a clinically meaningful way of relating the number and type of patients treated in a hospital (that is, its casemix) to the resources that the hospital requires.

Each AR-DRG represents a class of patient with similar clinical conditions requiring similar hospital resources. The AR-DRG system is partly hierarchical, with 23 Major Diagnostic Categories, which are divided into Surgical, Medical and Other partitions, and then into 708 individual AR-DRGs (in AR-DRG version 6.0x).

From 2002-03 to 2011-12, the number of hospitalisations involving surgery where head and neck cancer was the principal diagnosis increased from 3,305 in 2002-03 to 3,725 in 2011-12, an overall increase of 12.7%. All head and neck cancer groups had an increase in surgery numbers from 2002-03 to 2011-12:

- Oral cavity cancer increased from 1,817 to 2,012
- Pharynx increased from 442 to 501
- Larynx increased from 502 to 590
- Salivary glands increased from 319 to 402
- Nasal cavity and paranasal sinus increased from 163 to 198 (Figure 7.3).



Chemotherapy and radiotherapy for head and neck cancers

The number of hospitalisations for chemotherapy for head and neck cancers increased from 2,561 in 2002-03 to 3,952 in 2011-12.

Over the same period, hospitalisation numbers for radiotherapy for head and neck cancers increased from 31 in 2002-03 to 124 in 2011-12 (Table A10).

Box 2: Hospital admitted cancer-related chemotherapy data

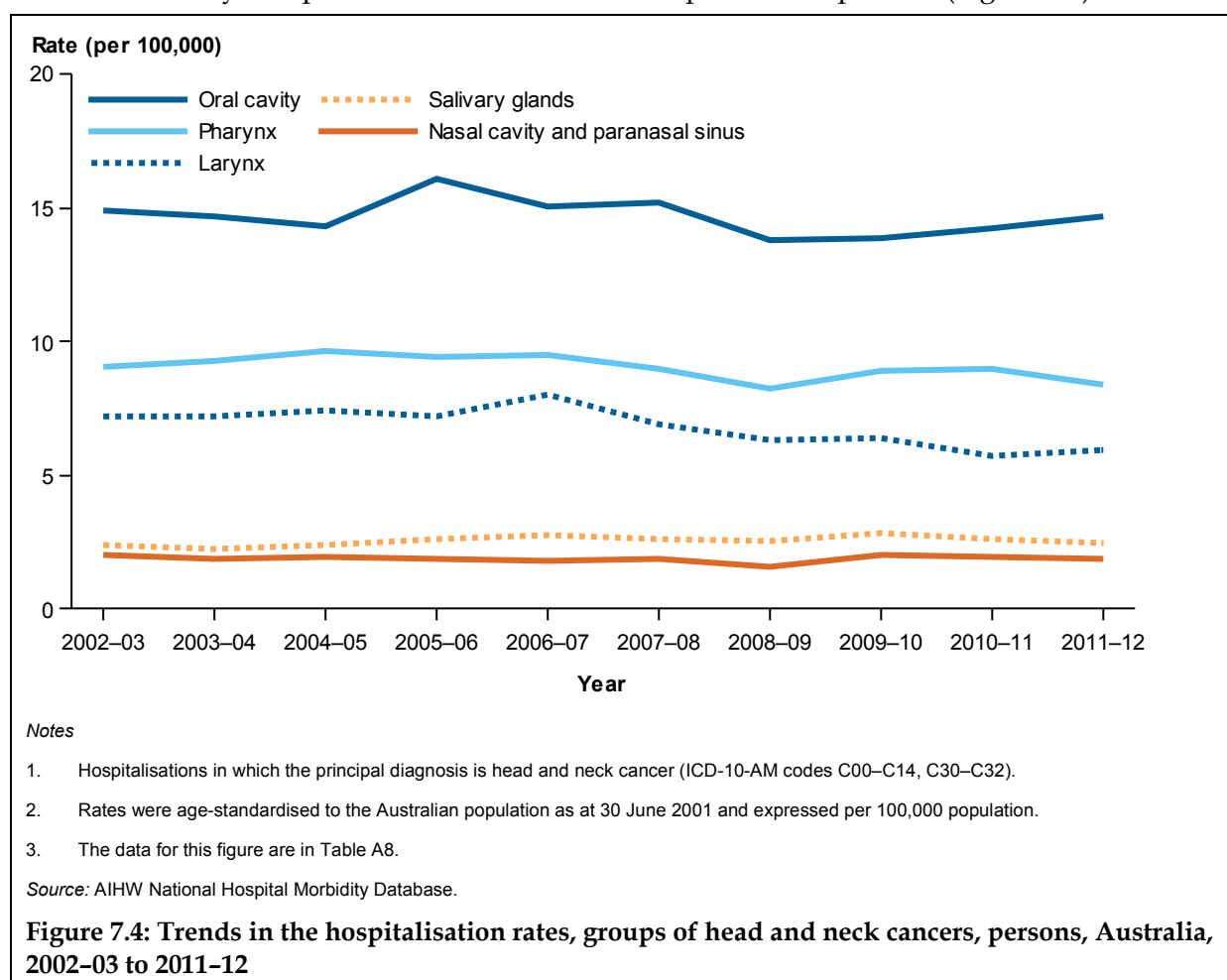
The number and rate of hospital admitted cancer-related chemotherapy procedures change over time due to the admission processes of public hospitals in state and territories. These hospitals provide same-day chemotherapy for outpatients on a non-admitted basis. This means that patients who receive same-day chemotherapy treatment for cancer in those hospitals are usually not recorded in the National Hospitals Morbidity Database and do not contribute to hospitals data.

Hospitalisation rates for head and neck cancer groups

From 2002–03 to 2011–12, age-standardised hospitalisation rates where head and neck cancer was the principal diagnosis varied from year to year, decreasing from 37.1 per 100,000 persons in 2002–03 to 33.9 per 100,000 persons in 2011–12.

From 2002–03 to 2011–12, Oral cavity continued to have the highest age-standardised hospitalisation rates followed by Pharynx, Larynx, Salivary glands and Nasal cavity and paranasal sinuses. Rates remained relatively stable for each group with:

- Oral cavity at around 15.0 per 100,000 persons
- Pharynx at around 9.0 per 100,000 persons
- Larynx at around 7.0 per 100,000 persons
- Salivary glands at around 2.4 per 100,000 persons
- Nasal cavity and paranasal sinus at around 1.9 per 100,000 persons (Figure 7.4).



Surgery rates for head and neck cancers

From 2002–03 to 2011–12, the age-standardised hospitalisation rate for hospitalisations involving surgery where head and neck cancer was the principal diagnosis increased from 16.5 per 100,000 in 2002–03 to 18.7 per 100,000 in 2011–12. From 2002–03 to 2011–12, changes in hospitalisation rates involving surgery for head and neck cancer groups were:

- Oral cavity from 9.1 per 100,000 in 2002–03 to 10.0 per 100,000 in 2011–12
- Pharynx from 2.2 per 100,000 to 2.5 per 100,000
- Larynx from 2.5 per 100,000 to 2.9 per 100,000
- Salivary glands from 1.6 per 100,000 to 2.0 per 100,000
- Nasal cavity and paranasal sinus from 0.8 per 100,000 to 0.9 per 100,000 (Table A9).

Chemotherapy and radiotherapy rates for head and neck cancers

The age-standardised hospitalisation rate for head and neck cancer involving chemotherapy changed from 12.9 per 100,000 in 2002–03 to 19.8 per 100,000 in 2011–12.

Over the same period, the age-standardised hospitalisation rate for head and neck cancers involving radiotherapy changed from 0.1 per 100,000 in 2002–03 to 0.6 per 100,000 in 2011–12 (Table A10).

8. Spotlight on the human papillomavirus and head and neck cancer

What is human papilloma virus?

Human papillomavirus (HPV) affects human skin and the moist membranes that line the body. It is the most common sexually transmitted infection. Sexually transmitted HPVs are spread through contact with infected genital skin, mucous membranes, or bodily fluids, and can be transmitted through intercourse and oral sex (American Cancer Society 2013). The virus can be transmitted between male and female partners as well as same-sex partners – even when the infected person has no signs or symptoms.

HPV has been known to contribute to cancer, including cancer of the cervix, vagina, vulva, penis and anus (CDCP 2013a). More recently, HPV has been recognised as contributing to some cancers of the head and neck. The high-risk HPVs (particularly type 16), have been linked to cancers affecting the oral cavity and oropharynx.

HPV infection often has no symptoms so people infected with the virus may not know they have it (CDCP 2013b). The majority of genital HPV cases resolve spontaneously, clearing (i.e. no longer detectable) within 12–24 months of initial infection (NCIRS 2013).

In total, there are over 100 different HPV subtypes of which about 40 are known as genital HPV. Some HPV types, including types 16, 18, 31, 33, 35, 45, 52 and 58, are designated as ‘high risk’, as they are causally associated with the development of cancer. Other HPV types, including types 6, 11, 40, 42, 43, 44, 54, 61, 70, 72, 81 and 89, have been classified as ‘low risk’ and are predominantly associated with non-malignant lesions, such as genital warts. Other types are uncommon and their associations with disease are not believed to be significant causes of cancer (Munoz et al. 2003).

Not all of the 40 genital HPV viruses can cause serious health problems. Sexually transmitted HPVs fall into two categories:

- Low-risk HPVs – do not cause cancer but can cause warts on or around the genitals or anus.
- High-risk HPVs – can cause cancer. HPV types 16 and 18, are responsible for the majority of HPV-caused cancers (NCI 2012).

HPV and head and neck cancer

Over the past 15 years, evidence has been accumulating that implicates HPV as an important carcinogenic agent in a subset of head and neck cancers (oral cavity and oropharyngeal squamous cell cancers) (Fakhry & Gillison 2006).

The reported proportions of oropharyngeal cancers associated with HPV vary widely ranging from 12% to 63%, with a lower proportion of oral cancers (Adelstein et al. 2009; Smith et al. 2004). Of the cancers in these sites that were HPV positive, HPV-16 and/or HPV-18 account for more than 85%.

Recent studies show that about 60%–70% of cancers of the oropharynx may be linked to HPV. A mix of tobacco, alcohol and HPV may cause many of these cancers (CDCP 2013c).

Head and neck cancers can be evaluated for the presence of HPV, which is useful for determining optimal treatment. Typically this is done by testing for the presence of HPV DNA in the removed tumour or biopsy (Johns Hopkins Medicines 2013), but other methods are being investigated such as surrogate markers for HPV and the usefulness of HPV titres (concentration).

Currently, biopsies of head and neck cancers to ascertain if a lesion contains HPV DNA are not routine so complete data are not available on the number of head and neck cancers where HPV DNA is present.

HPV and the Australian National Immunisation Program

During the past decade there has been a greater understanding of the natural history of cervical cancer. It is now recognised that cervical cancer is a rare outcome of persistent infection with HPV, and that infection with a high-risk HPV type is necessary, although not sufficient, for the development of cervical cancer (Bosch et al. 2002; Walboomers et al. 1999).

Following the discovery that infection with HPV is necessary for the development of cervical cancer, the National HPV Vaccination Program (NHVP) was introduced in Australia in 2007. Studies have shown a major decrease in HPV infections among the vaccinated group (Department of Health 2013b).

The HPV Vaccination Program provides free HPV vaccination to three groups:

- girls aged 12–13 in a school-based program, generally delivered in the first year of high school
- boys aged 12–13 in a school-based program, generally delivered in the first year of high school
- boys aged 14–15 as part of a catch-up school-based program, delivered during 2013 and 2014.

A national HPV vaccination program register was set up in 2008 to monitor and evaluate the HPV Vaccination Program. The register collects data about HPV vaccine doses administered in Australia, including selected demographic data, and data on the person who administered the vaccine. This ensures patient records of vaccination are up to date and provides a resource which immunisation providers can check to confirm a patient's vaccination history (NCI 2012).

In 2011, the number of girls turning 15 years who participated in the HPV Vaccination Program nationally was 322,194, (71.2% of eligible participants) (Department of Health 2013a).

There are currently limited published data on the effectiveness of HPV vaccines in reducing the incidence of head and neck cancers. However, the introduction of HPV vaccination as a public health measure against HPV infection may also result in a favourable impact on the frequency of head and neck cancers (Betiol et al. 2013).

9. Discussion

This report presents an overview of incidence, mortality, survival and hospitalisation for head and neck cancers. It also discusses risk factors that can contribute to a person developing head and neck cancers.

In this report, head and neck cancer has been separated into 5 groups:

- Oral cavity
- Salivary glands
- Pharynx
- Nasal cavity and paranasal sinus
- Larynx.

Of the 5 groups, the data shows 3 clear groupings in relation to incidence, mortality, and hospitalisation numbers and rates.

Oral cavity cancer accounts for the highest incidence, mortality and hospitalisation numbers and rates in all 3 categories. The next highest are the cancer groups Pharynx and Larynx. Both of these cancer groups have similar patterns of numbers and rates for incidence, mortality and hospitalisations. Finally, Salivary glands and Paranasal sinuses have the lowest numbers and rates of incidence, mortality and hospitalisations.

The age-standardised incidence rate for head and neck cancers in males has decreased from 32.4 per 100,000 persons in 1982 to 25.9 per 100,000 persons in 2009. Similarly, the age-standardised mortality rate of all head and neck cancers in males decreased from 10.0 per 100,000 persons in 1982 to 6.0 per 100,000 persons in 2011. Five-year relative survival increased from 61.8% in 1982–1987 to 68.2% in 2006–2010. These improvements accompany reduced smoking rates from 40.3% in 1983 to 16.4% in 2010. Smoking is a risk factor for head and neck cancers; however, the lag in time between smoking and the onset of cancer must be considered when interpreting these data.

More Australians born in north-east and south-east Asia are diagnosed with nasopharyngeal cancers (a cancer included in the Pharynx group) than would be expected from their representation in the general Australian population.

In 2009, a total of 122 nasopharyngeal cancers were diagnosed in Australia. Of these, 45 were diagnosed in people born in north-east or south-east Asia (37%). In comparison, the proportion of Australians who were born in north-east or south-east Asia in 2011 was only 3.25%.

Viruses, such as Epstein–Barr virus and Cytomegalovirus also have links to head and neck cancers (Paradise et al. 2013).

HPV has been known to contribute to cancer, including cancer of the cervix, vagina, penis and anus (CDCP 2013a). More recently, HPV has been recognised as contributing to some cancers of the head and neck. The high-risk HPVs (particularly type 16), have been linked to cancers affecting oral cavity and pharynx (the area at the back of the throat). Currently, biopsies of head and neck cancers are not routine to ascertain if a lesion contains HPV DNA so complete data are not available on the number of head and neck cancers where HPV DNA is present.

In 2007, the Australian Government implemented the National Immunisation Program (NIP) designed to protect young women against HPV infections that can lead to various cancers including cervical, oral cavity and pharynx cancers later in life (AIHW 2013b). Subsequent studies have since shown a substantial drop in HPV-related infection among the vaccinated group (Australian Government 2013). A collaborative study that the AIHW and the Victorian Cytology Service conducted showed for the first time that the Australian HPV vaccination program is preventing cervical pre-cancer lesions in young women (Gertig et al. 2013). In 2013, the HPV vaccination program was extended to males aged 12–13. Males aged 14–15 years will also be able to receive the vaccine through a catch-up program in 2013 and 2014.

The effectiveness of HPV vaccines against head and neck cancers is not conclusive. However, the introduction of HPV vaccination as a public health measure against HPV infection may also result in a favourable impact on the frequency of head and neck cancers (Betiol et al. 2013).

Head and neck cancers are less common cancers and, as such, don't always receive the same attention as other more common cancers. Many head and neck cancers can be attributed to lifestyle factors including smoking, excess alcohol consumption, poor diet and excess sun exposure. Therefore, altering lifestyle behaviours can play a major role in reducing the number of head and neck cancers diagnosed.

Appendix A

Defining head and neck cancers

Head and neck cancers are defined for use in AIHW reporting in consultation with the Australasian Association of Cancer Registries (AACR), using the ICD codes/groups described in Table 1.

Table 1: Head and neck cancers, AIHW/AACR, ICD-10/ICD-10-AM and ICD-9 codes

Broad grouping	Sub-grouping	Site	ICD-10/ ICD-10-AM code	ICD-9 code
Oral cavity	Lip	Malignant neoplasm of lip	C00	140
	Tongue	Malignant neoplasm of base of tongue	C01	141.0
		Malignant neoplasm of other and unspecified parts of tongue	C02	141.1–141.9
	Other oral cavity	Malignant neoplasm of gum	C03	143
		Malignant neoplasm of floor of mouth	C04	144
		Malignant neoplasm of palate	C05	145.2, 145.3, 145.5
Malignant neoplasm of other and unspecified parts of mouth		C06	145.0, 145.1, 145.4, 145.6–145.9	
Salivary glands	Malignant neoplasm of parotid gland	C07	142.0	
	Malignant neoplasm of other and unspecified major salivary glands	C08	142.1–142.9	
Pharynx	Oropharynx, including tonsil	Malignant neoplasm of tonsil	C09	146.0
		Malignant neoplasm of oropharynx	C10	146.1–146.9
	Nasopharynx	Malignant neoplasm of nasopharynx	C11	147
	Hypopharynx, including piriform sinus	Malignant neoplasm of piriform sinus	C12	148.1
		Malignant neoplasm of hypopharynx	C13	148.0, 148.2–148.9
Other and ill-defined sites in lip, oral cavity and pharynx			C14	149
Nasal cavity and paranasal sinus	Malignant neoplasm of nasal cavity and middle ear		C30	160
	Malignant neoplasm of accessory sinuses		C31	
Larynx	Malignant neoplasm of larynx		C32	161

Notes

1. ICD-9 codes were used in analysis of mortality data.
2. ICD-10 codes were used in analysis of incidence and survival data.
3. ICD-10-AM codes were used in analysis of hospitalisation data.
4. Hospitalisation data excludes separations with care type of newborns with only unqualified days, hospital boarders and posthumous organ procurement.

Appendix B

Australian Cancer Database 2009 Data Quality Statement

Identifying and definitional attributes

<i>Metadata item type:</i>	Quality statement
<i>Synonymous names:</i>	ACD 2009
<i>METeOR identifier:</i>	500417
<i>Registration status:</i>	AIHW Data Quality Statements, Endorsed 11/12/2012

Data quality

Quality statement:

Important note

To avoid excessive repetition in what follows, the word 'cancer' is used to mean 'cancer, excluding basal cell carcinomas of the skin and squamous cell carcinomas of the skin'. In most states and territories these 2 very common skin cancers are not notifiable diseases and as such are not in the scope of the Australian Cancer Database (ACD).

Summary of key issues

- All states and territories maintain a population-based cancer registry to which all cancer cases and deaths must be reported.
- The AIHW compiles the ACD using information from state and territory registers.
- Some duplication may occur where the same person and cancer have been registered in 2 or more jurisdictions. The AIHW provisionally resolves these instances and notifies the relevant states and territories of possible duplicates. Full resolution has usually occurred by the following year's version of the ACD.
- The level of duplication is small, about 0.17% of all records.
- Cancer registry databases change every day, adding new records and improving the quality of existing records as new information becomes available. Information on ACD records may therefore change from year to year.

Description

All states and territories have legislation that makes cancer a notifiable disease. All hospitals, pathology laboratories, radiotherapy centres and registries of births, deaths and marriages must report cancer cases and deaths to the state or territory population-based cancer registry.

Each registry supplies incidence data annually to the AIHW under an agreement between the registries and the AIHW. These data are compiled into the ACD, the only Australian repository of national cancer incidence data.

Institutional environment:

The Australian Institute of Health and Welfare (AIHW) is a major national agency set up by the Australian Government under the *Australian Institute of Health and Welfare Act 1987* to provide reliable, regular and relevant information and statistics on Australia's health and welfare. It is an independent statutory authority established in 1987, governed by a management board, and accountable to the Australian Parliament through the Health portfolio.

The AIHW aims to improve the health and wellbeing of Australians through better health and welfare information and statistics. It collects and reports information on a wide range of topics and issues, ranging from health and welfare expenditure, hospitals, disease and injury, and mental health, to ageing, homelessness, disability and child protection.

The Institute also plays a role in developing and maintaining national metadata standards. This work contributes to improving the quality and consistency of national health and welfare statistics. The Institute works closely with governments and non-government organisations to achieve greater adherence to these standards in administrative data collections, to promote national consistency and comparability of data and reporting.

One of the main functions of the AIHW is to work with the states and territories to improve the quality of administrative data and, where possible, to compile national data sets based on data from each jurisdiction, to analyse these data sets and disseminate information and statistics.

The *Australian Institute of Health and Welfare Act 1987*, in conjunction with compliance to the *Privacy Act 1988* (Commonwealth), ensures that the data collections that the AIHW manages are kept securely and under the strictest conditions with respect to privacy and confidentiality.

For further information, see the AIHW website <www.aihw.gov.au>.

The AIHW has been maintaining the ACD since 1986.

Relevance:

The ACD is highly relevant for monitoring trends in cancer incidence. The data are used for many purposes, such as by policy makers to evaluate health intervention programs and as background data for health labour force planning and health expenditure; by pharmaceutical companies to assess the size of the market for new drugs; by researchers to explore the epidemiology of cancer; by insurance companies to evaluate the risk of people being diagnosed with cancer.

The ACD contains information on all reported cancer cases and deaths in Australia. Data can be provided at state and territory level and at Remoteness Area level.

The 3rd edition of the International Classification of Diseases for Oncology (ICD-O-3) is used to classify cancer cases. Data can also be classified according to the 10th revision of the International Statistical Classification of Diseases and Related Health Problems (ICD-10).

The ACD also contains the name and date of birth of each person diagnosed with cancer. This allows researchers who have enrolled people in a study to link their database to the ACD to find out which of their study subjects have been diagnosed with cancer, what kind of cancer, and when. (Such data linkage can only be undertaken after receiving approvals from various ethics committees.) This kind of research gives insight into cancer risk factors. Data linkage is also undertaken when a researcher has been contracted to investigate a potential

cancer cluster in a workplace or small area.

Timeliness:

This data quality statement refers to the 2009 version of the ACD, which contains data on all cancer cases diagnosed between 1982 and 2009. However, the number of cases in 2009 for NSW and the ACT was estimated (see 'Accuracy' section below).

Each jurisdictional cancer registry supplies data annually to the AIHW. Because each jurisdiction operates on its own data compilation and reporting cycle, the ACD cannot be fully compiled until the final jurisdiction supplies its data.

It generally takes a year or more for the state and territory cancer registries to fully process and release their latest full year of cancer data to the AIHW. Once the AIHW receives all the data sets from cancer registries, time is needed to check for data consistency and to deduplicate the data before the new version of the ACD is available for reporting purposes.

Accuracy:

The 1982–2009 data files for NSW and the ACT were not available for inclusion in the 2009 version of the ACD. An extended delay of the receipt of mortality data has meant that NSW and the ACT have not been able to close off their 2009 data sets. As a consequence, 2009 cancer data for these jurisdictions are not available for reporting purposes. The AIHW estimated the 2009 incidence data for NSW and the ACT in consultation with the NSW and ACT cancer registries. The estimates were combined with the actual data that these two jurisdictions supplied for the 2008 ACD to form their 1982–2009 data sets for inclusion in the 2009 ACD. Although the estimation procedure has been shown to be reasonably accurate for estimating overall cancer incidence, its accuracy with respect to individual cancers will vary. As NSW and ACT make up about a third of Australia's population, the national incidence data for 2009 is likely to be somewhat inaccurate for some individual cancers – which cancers these are is not predictable.

It is anticipated that future versions of the ACD will include 2009 actual data for NSW and ACT and the data will then be made available in subsequent cancer publications.

The publication *Cancer incidence in five continents* is issued about every 5 years as a collaborative effort by the International Agency for Research on Cancer (IARC) and the worldwide network of cancer registries. Australia's cancer registries continue to pass IARC's numerous tests for data quality. Details of the tests and Australia's cancer registries' results in them can be found in the above-mentioned book and the registries' annual incidence reports.

Each year, when all the registries' new data have been compiled into the new ACD, a data linkage process called the national deduplication is undertaken. This process detects instances where the same person and cancer have been registered in two or more jurisdictions. This could happen, for example, when a person attends hospitals in different jurisdictions. All such instances that are found are provisionally resolved at the AIHW by removing one record while the relevant jurisdictions are notified of the situation so that they can determine in which jurisdiction the person was a usual resident at the time of diagnosis. Their resolution will flow through to the ACD in the next year's data supply. In recent years the national deduplication has resulted in the removal of about 3,500 records from the ACD, which is about 0.17% of all records that the jurisdictions supplied.

While all state and territory cancer registries collect information on Indigenous status, in some jurisdictions the level of identification of Indigenous Australians is considered to be

insufficient to enable analysis. Data for 4 states and territories – New South Wales, Queensland, Western Australia and the Northern Territory – are considered suitable for analysis.

Cancer registry databases change every day, and not just because new records are added. Existing records are changed if new, more precise, information about the diagnosis becomes available. Also, any typographical errors that routine data checking procedures discover are corrected by referring to the source documentation. Finally, existing records can be deleted if it is discovered that the initial diagnosis of cancer was incorrect (for example, the tumour was in fact benign) or the person is found to be not a resident of that state or territory. As a result of all these issues, the number of cancer cases that the AIHW reports for any particular year may change slightly over time, and data that a cancer registry publishes at a certain time may differ slightly from what the AIHW publishes at a different time.

Coherence:

The AIHW reports and publishes cancer data annually. While there are sometimes changes to coding for particular cancers, it is possible to map coding changes to make meaningful comparisons over time.

Interpretability:

Information on the ACD is available on the AIHW website.

While numbers of new cancers are easy to interpret, other statistical calculations (for example, calculations of age-standardised rates and confidence intervals) are more complex and their concepts may be confusing to some users. In most publications, there is an appendix on statistical methods as well as technical notes.

Accessibility:

The AIHW website provides cancer incidence and mortality data that can be downloaded without charge. Numerous reports, including the biennial *Cancer in Australia*, are published and are available on the AIHW website where they can also be downloaded without charge. Users can request data not available online or in reports via the Cancer and Screening Unit of the AIHW on (02) 6244 1000 or via email to <cancer@aihw.gov.au>. Requests that take longer than half an hour to compile are charged for on a cost-recovery basis. General enquiries about AIHW publications can be made to the Media and Strategic Engagement Unit on (02) 6244 1032 or via email to <info@aihw.gov.au>.

Researchers following a cohort of people enrolled in a longitudinal study of health outcomes can request the AIHW to undertake data linkage of their cohort to the ACD. The AIHW Ethics Committee, as well as the ethics committees governing access to the state and territory cancer registries, must approve such requests.

Source and reference attributes

Submitting organisation: Australian Institute of Health and Welfare

Steward: Australian Institute of Health and Welfare

Relational attributes

Related metadata references:

See also Australian Cancer Database 2008 Data Quality Statement AIHW Data Quality Statements, Endorsed 20/07/2012.

Tables

Table A1: Smoking rates by sex, Australia, 1964–2010

Year	Males	Females
1964	58.0	28.0
1966	55.0	26.0
1969	45.0	28.0
1974	45.3	29.6
1976	43.9	32.5
1980	41.1	31.1
1983	40.3	30.9
1986	32.9	28.5
1989	30.2	27.0
1992	28.2	23.8
1995	26.3	22.0
1998	24.4	19.8
2001	21.4	18.2
2004	18.6	16.3
2007	18.0	15.2
2010	16.4	13.9

Notes

1. Smoked at least 100 cigarettes (manufactured and/or roll-your-own) or the equivalent amount of tobacco in their life, and reports no longer smoking.
2. Never smoked 100 cigarettes (manufactured and/or roll-your-own) or the equivalent amount of tobacco.
3. Some trend data were updated in 2010 and may not match data presented in previous reports.

Source: OECD health data, 2013.

Table A2: Incidence numbers and rates, and mortality numbers and rates of all head and neck cancers combined, persons, Australia, 1982–2011

Year	Number of new cases	Incidence rate	Number of deaths	Mortality rate	Mortality/Incidence ratio
1982	2,475	19.3	752	6.1	0.32
1983	2,573	19.7	757	5.9	0.30
1984	2,578	19.3	897	6.9	0.36
1985	2,666	19.6	880	6.6	0.34
1986	2,610	18.8	851	6.2	0.33
1987	2,847	20.1	922	6.6	0.33
1988	2,876	19.8	862	6.0	0.30
1989	3,048	20.5	921	6.2	0.30
1990	3,034	20.0	927	6.2	0.31
1991	3,145	20.3	983	6.5	0.32
1992	3,482	22.0	964	6.1	0.28
1993	3,257	20.2	956	6.0	0.30
1994	3,219	19.6	945	5.8	0.30
1995	3,368	20.1	907	5.5	0.27
1996	3,430	20.0	1,011	6.0	0.30
1997	3,581	20.4	898	5.1	0.25
1998	3,615	20.2	896	5.0	0.25
1999	3,385	18.5	939	5.1	0.28
2000	3,441	18.3	946	5.0	0.27
2001	3,385	17.6	988	5.1	0.29
2002	3,518	17.8	948	4.8	0.27
2003	3,515	17.4	931	4.6	0.26
2004	3,429	16.7	887	4.3	0.26
2005	3,545	16.8	902	4.3	0.26
2006	3,680	17.2	838	3.9	0.23
2007	3,767	17.0	919	4.1	0.24
2008	3,722	16.5	947	4.1	0.25
2009	3,896	16.8	990	4.3	0.26
2010			1,030	4.3	
2011			944	3.8	

Notes

1. Cancers coded in ICD-10 as C00–C14, C30–C32.
2. Deaths registered in 2009 and earlier are based on the final version of cause of death data; deaths registered in 2010 and 2011 are based on revised and preliminary versions, respectively and are subject to further revision.
3. Rates are age-standardised to the estimated resident population of Australia for 30 June 2001 and expressed per 100,000 population.
4. The mortality data in AIHW National Mortality Database were provided by the Registries of Births, Deaths and Marriages and the National Coronial Information System and coded by the Australian Bureau of Statistics.
5. Years in table refer to year of occurrence of death except for the most recent year, which refers to the year of registration of death.
6. Rates are per 100,000.

Source: AIHW Australian Cancer Database 2009 and AIHW National Mortality Database.

Table A3: Incidence numbers and rates and mortality numbers and rates of all head and neck cancers combined, by sex, Australia, 1982–2011

Year	Number of new cases	Incidence rate	Number of deaths	Mortality rate	Number of new cases	Incidence rate	Number of deaths	Mortality rate
Males					Females			
1982	1,943	32.4	570	10.0	532	7.9	182	2.8
1983	2,007	32.9	591	10.1	566	8.2	166	2.4
1984	2,015	32.7	689	11.7	563	8.1	208	3.0
1985	2,061	32.4	696	11.9	605	8.4	184	2.6
1986	2,018	31.2	643	10.1	592	7.9	208	2.8
1987	2,177	32.9	686	10.7	670	8.9	236	3.0
1988	2,212	32.7	657	10.0	664	8.5	205	2.6
1989	2,348	33.8	706	10.5	700	8.8	215	2.7
1990	2,285	32.0	717	10.5	749	9.3	210	2.6
1991	2,361	32.6	730	10.5	784	9.5	253	3.0
1992	2,623	35.6	757	10.4	859	10.1	207	2.4
1993	2,492	33.1	713	9.8	765	8.9	243	2.8
1994	2,384	31.1	707	9.4	835	9.5	238	2.7
1995	2,481	31.6	691	9.2	887	9.9	216	2.4
1996	2,521	31.4	762	9.8	909	9.9	249	2.7
1997	2,609	31.9	682	8.6	972	10.3	216	2.2
1998	2,653	31.6	685	8.4	962	10.0	211	2.1
1999	2,453	28.4	688	8.3	932	9.5	251	2.4
2000	2,487	28.1	696	8.1	954	9.5	250	2.4
2001	2,490	27.4	754	8.5	895	8.7	234	2.2
2002	2,565	27.5	714	8.0	953	9.1	234	2.1
2003	2,590	27.0	676	7.3	925	8.6	255	2.3
2004	2,485	25.5	666	7.0	944	8.6	221	1.9
2005	2,577	25.8	688	7.0	968	8.6	214	1.9
2006	2,736	26.9	654	6.5	944	8.3	184	1.6
2007	2,767	26.4	679	6.6	1,000	8.5	240	1.9
2008	2,688	25.0	702	6.7	1,034	8.6	245	1.9
2009	2,875	25.9	741	6.8	1,021	8.4	249	2.0
2010			772	6.9			258	1.9
2011			691	6.0			253	1.8

Notes

1. Cancers coded in ICD-10 as C00–C14, C30–C32.
2. Deaths registered in 2009 and earlier are based on the final version of cause of death data; deaths registered in 2010 and 2011 are based on revised and preliminary versions, respectively and are subject to further revision.
3. Rates are age-standardised to the estimated resident population of Australia for 30 June 2001 and expressed per 100,000 population.
4. The mortality data in AIHW National Mortality Database were provided by the Registries of Births, Deaths and Marriages and the National Coronial Information System and coded by the Australian Bureau of Statistics.
5. Years in table refer to year of occurrence of death except for the most recent year, which refers to the year of registration of death.

Source: AIHW Australian Cancer Database 2009 and AIHW National Mortality Database.

Table A4: Incidence numbers and rates of groups of head and neck cancers, persons, Australia, 1982–2009

Year	Oral cavity		Salivary glands		Pharynx		Nasal cavity and paranasal sinus		Larynx	
	Incidence number	Rate	Incidence number	Rate	Incidence number	Rate	Incidence number	Rate	Incidence number	Rate
1982	1,263	9.9	152	1.2	378	2.9	96	0.8	553	4.3
1983	1,300	10.0	124	1.0	433	3.3	82	0.7	600	4.5
1984	1,262	9.4	158	1.2	453	3.3	120	0.9	549	4.1
1985	1,380	10.2	167	1.3	444	3.2	102	0.8	525	3.8
1986	1,270	9.2	159	1.2	483	3.5	102	0.7	566	4.0
1987	1,502	10.7	148	1.1	459	3.2	87	0.6	594	4.2
1988	1,538	10.6	151	1.0	454	3.1	98	0.7	581	3.9
1989	1,605	10.9	190	1.3	497	3.3	109	0.7	600	4.0
1990	1,628	10.8	161	1.1	495	3.2	110	0.7	601	3.9
1991	1,712	11.1	170	1.1	496	3.2	122	0.8	579	3.7
1992	1,918	12.1	192	1.3	511	3.2	112	0.7	675	4.3
1993	1,772	11.0	179	1.1	513	3.2	139	0.9	589	3.6
1994	1,787	10.9	194	1.2	504	3.0	123	0.8	556	3.4
1995	1,857	11.1	186	1.1	549	3.3	117	0.7	596	3.6
1996	1,969	11.5	183	1.1	518	3.0	122	0.7	578	3.4
1997	2,094	12.0	210	1.2	483	2.7	133	0.8	587	3.4
1998	2,050	11.4	217	1.2	535	3.0	125	0.7	623	3.5
1999	1,811	9.9	213	1.2	600	3.3	124	0.7	568	3.1
2000	1,846	9.8	239	1.3	566	3.0	145	0.8	561	3.0
2001	1,835	9.5	240	1.2	525	2.7	126	0.7	583	3.0
2002	1,974	10.0	214	1.1	577	2.9	131	0.7	541	2.7
2003	1,974	9.8	234	1.2	536	2.7	130	0.6	567	2.8
2004	1,837	8.9	243	1.2	546	2.7	137	0.7	601	2.9
2005	1,830	8.7	260	1.2	605	2.9	173	0.8	590	2.8
2006	1,908	8.9	265	1.2	654	3.0	149	0.7	622	2.9
2007	2,012	9.1	291	1.3	643	2.9	155	0.7	583	2.6
2008	1,933	8.6	274	1.2	683	3.0	174	0.8	589	2.6
2009	2,037	8.8	265	1.1	739	3.2	166	0.7	606	2.6

Notes

1. Cancers coded in ICD-10 as C00–C13, C30–C32.
2. Rates are age-standardised to the estimated resident population of Australia for 30 June 2001 and expressed per 100,000 population.

Source: AIHW Australian Cancer Database 2009.

Table A5: Mortality numbers and rates of groups of head and neck cancers, persons, Australia, 1982–2011

Year	Oral cavity		Salivary glands		Pharynx		Nasal cavity and paranasal sinus		Larynx	
	Number of deaths	Rate	Number of deaths	Rate	Number of deaths	Rate	Number of deaths	Rate	Number of deaths	Rate
1982	237	1.4	40	0.2	217	1.2	47	0.3	192	1.1
1983	260	1.5	48	0.3	193	1.1	40	0.2	203	1.1
1984	304	1.7	58	0.3	222	1.2	44	0.2	239	1.3
1985	309	1.7	59	0.3	214	1.2	45	0.2	217	1.2
1986	277	1.5	56	0.3	215	1.2	44	0.2	228	1.2
1987	303	1.6	45	0.2	255	1.4	41	0.2	247	1.3
1988	301	1.6	60	0.3	238	1.3	25	0.1	211	1.1
1989	313	1.7	54	0.3	248	1.3	42	0.2	238	1.3
1990	321	1.7	50	0.3	248	1.3	37	0.2	251	1.3
1991	314	1.6	72	0.4	271	1.4	43	0.2	256	1.3
1992	318	1.6	43	0.2	264	1.4	50	0.3	264	1.4
1993	296	1.5	62	0.3	268	1.4	48	0.2	247	1.3
1994	317	1.6	62	0.3	262	1.3	41	0.2	239	1.2
1995	311	1.6	64	0.3	244	1.2	38	0.2	226	1.2
1996	322	1.6	78	0.4	283	1.4	47	0.2	248	1.3
1997	269	1.4	49	0.3	256	1.3	30	0.2	256	1.3
1998	307	1.6	73	0.4	229	1.2	53	0.3	198	1.0
1999	316	1.6	49	0.3	240	1.2	34	0.2	245	1.3
2000	326	1.7	57	0.3	250	1.3	36	0.2	239	1.2
2001	326	1.7	59	0.3	261	1.4	45	0.2	248	1.3
2002	302	1.6	88	0.5	234	1.2	37	0.2	241	1.3
2003	305	1.6	72	0.4	221	1.2	33	0.2	224	1.2
2004	275	1.4	66	0.3	203	1.1	44	0.2	218	1.1
2005	269	1.4	81	0.4	225	1.2	35	0.2	214	1.1
2006	270	1.4	61	0.3	191	1.0	27	0.1	203	1.0
2007	328	1.6	66	0.3	210	1.0	22	0.1	220	1.1
2008	305	1.5	89	0.4	208	1.0	27	0.1	229	1.1
2009	311	1.4	80	0.4	270	1.3	32	0.1	214	1.0
2010	323	1.5	82	0.4	252	1.1	38	0.2	254	1.2
2011	294	1.3	79	0.4	238	1.1	37	0.2	207	0.9

Notes

1. Deaths registered in 2009 and earlier are based on the final version of cause of death data; deaths registered in 2010 and 2011 are based on revised and preliminary versions, respectively and are subject to further revision.
2. Cancers coded in ICD-10 as C00–C13, C30–C32.
3. Rates are age-standardised to the estimated resident population of Australia for 30 June 2001 and expressed per 100,000 population.
4. The mortality data in AIHW National Mortality Database were provided by the Registries of Births, Deaths and Marriages and the National Coronial Information System and coded by the Australian Bureau of Statistics.

Source: AIHW National Mortality Database.

Table A6: One-year and 5-year relative survival after diagnosis, head and neck cancer groups, by sex, Australia, 2006–2010

Head and neck cancer group	1-year relative survival			5-year relative survival		
	Males	Females	Persons	Males	Females	Persons
Oral cavity	90.5	88.1	89.8	75.6	73.8	75.0
Salivary glands	89.8	92.3	90.8	64.0	79.6	70.4
Pharynx	80.1	78.7	79.8	54.8	58.2	55.5
Nasal cavity and paranasal sinus	83.3	78.7	81.7	61.2	58.6	60.3
Larynx	86.3	88.0	86.4	64.8	64.1	64.8
All head and neck combined	86.7	86.3	86.6	67.4	70.4	68.2

Note: Cancers coded in ICD-10 as C00–C14, C30–C32.

Source: AIHW Australian Cancer Database 2007.

Table A7: Hospitalisation numbers and rates for all head and neck cancers combined, by sex, Australia, 2002–03 to 2011–12

Year	Males		Females	
	Number	Rate	Number	Rate
2002–03	5,595	58.3	1,853	17.5
2003–04	5,622	57.3	1,830	17.0
2004–05	5,885	58.7	1,791	16.3
2005–06	6,170	60.2	2,035	18.0
2006–07	6,326	60.3	2,082	18.1
2007–08	6,123	57.2	2,041	17.2
2008–09	5,786	52.4	1,918	15.9
2009–10	6,173	54.3	2,077	16.9
2010–11	6,245	53.5	2,068	16.3
2011–12	6,362	52.7	2,116	16.2

Notes

1. Hospitalisations in which the principal diagnosis is one of the head and neck cancers (ICD-10-AM codes C00–C14, C30–C32).
2. Rates were age-standardised to the Australian population as at 30 June 2001 and expressed per 100,000 population.

Source: AIHW National Hospital Morbidity Database.

Table A8: Hospitalisation numbers and rates for groups of head and neck cancers and all head and neck cancers combined, persons, Australia, 2002–03 to 2011–12

Year	Oral cavity		Salivary glands		Pharynx		Nasal cavity and paranasal sinus		Larynx		All head and neck	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
2002–03	2,979	14.9	487	2.4	1,812	9.0	406	2.0	1,441	7.2	7,448	37.1
2003–04	3,002	14.7	464	2.2	1,893	9.2	390	1.9	1,475	7.2	7,452	36.3
2004–05	2,995	14.3	497	2.4	2,009	9.7	409	2.0	1,562	7.5	7,677	36.7
2005–06	3,444	16.1	561	2.6	2,009	9.4	401	1.8	1,553	7.2	8,205	38.2
2006–07	3,276	15.0	620	2.8	2,072	9.5	399	1.8	1,774	8.0	8,408	38.3
2007–08	3,384	15.2	590	2.6	2,001	9.0	417	1.8	1,554	6.9	8,164	36.4
2008–09	3,168	13.8	587	2.5	1,896	8.2	365	1.5	1,465	6.3	7,704	33.3
2009–10	3,277	13.9	667	2.8	2,094	8.9	473	2.0	1,530	6.4	8,250	34.8
2010–11	3,446	14.2	647	2.6	2,152	8.9	466	1.9	1,401	5.7	8,313	34.2
2011–12	3,659	14.6	608	2.4	2,073	8.4	462	1.9	1,512	6.0	8,478	33.9

Notes

1. Hospitalisations in which the principal diagnosis is one of the head and neck cancers (ICD-10-AM codes C00–C14, C30–C32).
2. Rates were age-standardised to the Australian population as at 30 June 2001 and expressed per 100,000 population.

Source: AIHW National Hospital Morbidity Database.

Table A9: Number of hospitalisations and surgeries, groups of head and neck cancers, persons, Australia, 2002–03 and 2011–12

Cancer group	2002–03				2011–12		
	Surgery		Other hospitalisation		Surgery		Other hospitalisation
	Number	Rate	Number	Rate	Number	Rate	Number
Oral cavity	1,817	9.1	1,162		2,012	10.0	1,647
Salivary glands	319	1.6	168		402	2.0	206
Pharynx	442	2.2	1,370		501	2.5	1,572
Nasal cavity and paranasal sinus	163	0.8	243		198	0.9	264
Larynx	502	2.5	939		590	2.9	922
All head and neck cancers	3,305	16.5	4,143		3,725	18.7	4,753

Notes

1. Hospitalisations in which the principal diagnosis is head and neck cancer (ICD-10-AM codes C00–C14, C30–C32).
2. Rates were age-standardised to the Australian population as at 30 June 2001 and expressed per 100,000 population.

Source: AIHW National Hospital Morbidity Database.

Table A10: Number and rate of chemotherapy and radiotherapy, head and neck cancers, Australia, 2002–03 and 2011–12

Treatment	2002–03		2011–12	
	Number	Rate	Number	Rate
Chemotherapy	2,561	12.9	3,952	19.8
Radiotherapy	31	0.1	124	0.6

Notes

1. Hospitalisations in which the principal diagnosis is head and neck cancer (ICD-10-AM codes C00–C14, C30–C32).
2. Rates were age-standardised to the Australian population as at 30 June 2001 and expressed per 100,000 population

Source: AIHW National Hospital Morbidity Database.

Glossary

Age-standardisation: A method of moving the influence of age when comparing populations with different age structures. This is usually necessary because the rates of many diseases vary strongly (usually increasing) with age. The structures of the different populations are converted to the same 'standard' structure; then the disease rates that would have occurred with that structure are calculated and compared.

Benign: Non-cancerous tumours that may grow larger but do not spread to other parts of the body.

Cancer (malignant neoplasm): A large range of diseases in which some of the body's cells become defective, begin to multiply out of control, can invade and damage the area around them, and can spread to other parts of the body to cause further damage.

Current smoker: A person who reported currently smoking daily, weekly or less often than weekly.

Hospitalisation: An episode of care for an admitted patient which may include a total hospital stay (from admission to discharge, transfer or death) or a portion of a hospital stay that begin or ends in a change of type of care (for example, from acute to rehabilitation).

Hypopharynx: The lowest part of the throat and behind the voice box.

Ill-defined head and neck cancers: Head and neck cancers which it is not possible to classify into one of the other 5 head and neck cancer groups. These head and neck cancers are included in the totals in this report but are not presented separately.

Incidence: The number of new cases (of an illness or event, and so on) in a given period.

Larynx: The larynx, also called the voice box, is a short passageway formed by cartilage just below the pharynx in the neck.

Malignant: A tumour with the capacity to spread to surrounding tissue or to other sites in the body.

Metastasis: the process by which cancerous cells are transferred from one part of the body to another, for example, via the lymphatic system or the bloodstream.

Nasal cavity and paranasal sinus: The paranasal sinuses are small hollow spaces in the bones of the head surrounding the nose. The nasal cavity is the hollow space inside the nose. This group also includes the middle ear.

Nasopharynx: The upper part of the pharynx, comprising the cavity behind the nose and above the soft palate.

Neoplasm: An abnormal ('neo', new) growth of tissue. Can be 'benign' (not a cancer) or 'malignant' (a cancer). Also known as a tumour.

Never-smoker: A person who does not smoke now and has smoked fewer than 100 cigarettes or the equivalent tobacco in his or her lifetime.

Oral cavity: The oral cavity includes the lips, tongue, and other areas within the oral cavity including the gums, floor of the mouth, the palate (roof of the mouth) and other unspecified parts of the mouth.

Oropharynx: The middle part of the pharynx, including the soft palate (the back of the mouth), the base of the tongue, and the tonsils.

Other cancers in the head and neck region: Cancers of the brain, eye, oesophagus, thyroid and parathyroid glands, as well as those of the scalp, skin, muscles and bones of the head and neck are generally not classified as head and neck cancers and are not included within this report.

Pharynx: The pharynx (throat) is a hollow tube that starts behind the nose and leads to the oesophagus. It has three parts:

- Nasopharynx – the upper part of the pharynx, cavity behind the nose and above the soft palate
- Oropharynx – the middle part of the pharynx, including the soft palate (the back of the mouth), the base of the tongue, and the tonsils
- Hypopharynx – the lowest part of the throat and behind the voice box.

Risk factor: Any factor that represents a greater risk of a health disorder or other unwanted condition or event. Some risk factors are regarded as causes of disease, others are not.

Salivary glands: The major salivary glands are in the floor of the mouth beneath the tongue (sublingual gland), near the ear (parotid gland) and near the jawbone (submandibular gland). There are other minor salivary glands located throughout the oral cavity.

Survival: A general term indicating the probability of being alive for a given amount of time after a particular event, such as a diagnosis of cancer.

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Related publications

AIHW and AACR (2012). Cancer in Australia: an overview 2012.

AIHW (2012). Cancer survival and prevalence: period estimates from 1982 to 2010.

Head and neck cancers in Australia, presents the latest available information on incidence, mortality, survival and hospitalisations.

Findings include:

- The total number of head and neck cancers diagnosed in 2009 was 3,896 accounting for 3.4% of all cancers diagnosed (114,137).
- The total number of deaths from head and neck cancers in 2011 was 944 accounting for 2.2% of all deaths from cancer (43,221).
- In 2006–2010, 5-year relative survival was 68.2% for all head and neck cancers combined.
- In 2011–12 there were 8,478 hospitalisations where head and neck cancer was the principal diagnosis.