

# Appendix I: Geography & demography of Victoria

## Location

Victoria is illustrated in the map. It lies between latitude 35°S and 39°S and longitude 141°E and 150°E. It is bounded to the north by New South Wales (NSW) and to the west by South Australia.

## Area

Victoria has a land area of 227,600 km<sup>2</sup>. It is slightly smaller than Great Britain and is the smallest of the mainland states of Australia with just under 3% of the total area.

## Relief and physical geography

Most of the state is below 200m in altitude but a hilly backbone extends east-west across the state. This belt of high country separates the riverine plains of the Murray and the sand plains of the Mallee and Wimmera to the north from the plains and uplands of the coastal area to the south. The highest point is Mount. Bogong with a height of 1,986m. The eastern uplands are heavily forested and receive more rainfall than the west. The western uplands are lower in relief and are a mixture of woodlands and cleared cropland.

## Geology

Victoria has a complex geology and a rich variety of minerals. It has enormous reserves of oil, natural gas and brown coal. The gold rushes of the 1850s played a role in the development of the state and gold is still being mined, as are copper, zinc and silver.

## Climate

Because of the uplands running east-west and the prevailing south-east to south-west winds, the south of the state receives more rain than the north. The moderating effect of the sea (no point in Victoria is more than 380kms from the ocean) means that snow is rarely seen below 600m and there are no permanent snowfields. Summer temperatures, especially when air is advected from the Australian land mass to the north, may exceed 35°C.



## Population numbers

The estimated population in 2004 comprised 4,962,970 persons, making Victoria the second most populous state after New South Wales. One in four Australians lives in Victoria.

The Aboriginal population was 25,078 (0.5% of the Victorian total and 6% of national indigenous population) at the 2001 census.

## Population distribution

Almost three-quarters of the population live in the Melbourne Metropolitan Area and most of the remainder live in small provincial cities with 0.1% living in remote areas. The average Victorian population density is 22 persons per km<sup>2</sup> (Australia 2.5 persons per km<sup>2</sup>) ranging from less than 2 in the Wimmera to 462 in Melbourne Statistical Division.

## Age and sex

The age-sex distribution is shown opposite. Although the shape of the pyramid has been modified by its immigrant history, Victoria has the type of population distribution expected in a country of late demographic transition. With a declining birth rate, a steady ageing of the population is expected and the pyramid will become increasingly rectangular as more people survive to older ages and the younger strata are not replaced.

## Ethnicity

At the 2001 census, 23% of the population was described as overseas born. Of these 1,025,106 persons, 22% were from Southern Europe (Italy 9%, former Yugoslavia 6%, Greece 6%), 21% from Great Britain, 20% from the Middle East, 12% from Asia (Vietnam 5%, China 5%, India 3%, Sri Lanka 2%), 7% from the rest of Europe and USSR, and smaller numbers from North and South America, Africa and Oceania.

## Employment

The employed population numbered 2,303,100 persons (2001 census), with an unemployment rate of 6.2% of the labour force. Of those employed, 8.6% were managers and administrators, 20.1% were professionals, 11.5% were associate professionals, 12.9% were tradespersons, 30.2% were clerical, sales and service workers, 8.9% were production and transport workers and 7.8% were labourers and related workers.

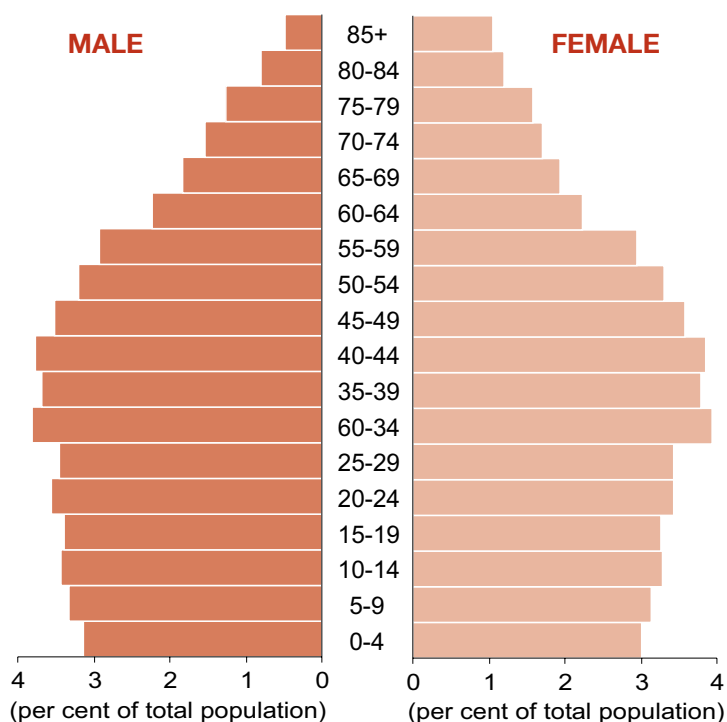
## Vital statistics

The birth rate has been steadily declining since the early 1970s. In 2003 the Victorian crude birth rate was 12.4 per 1,000 population.

Life expectancy at birth was, in 1999–2004, 77.0 years for males and 82.4 for females. Since 1982 this has increased by four years in males and females respectively.

There were 32,522 deaths registered in 2004 of which cancers accounted for 29%, ischaemic heart disease for 18%, cerebrovascular disease 9%, motor vehicle accidents 1% and diabetes 3%. The crude death rate was 6.5 per 1,000. The masculinity of deaths was 102 males per 100 females.

Population pyramid, Victoria 2004



Estimated Resident Population, Victoria 2004

Age	Males	Females	Persons
0-4	156,071	149,625	305,696
5-9	164,596	155,508	320,104
10-14	170,634	162,626	333,260
15-19	168,297	161,632	329,929
20-24	176,556	170,633	347,189
25-29	171,790	170,552	342,342
30-34	189,287	195,732	385,019
35-39	182,873	187,763	370,636
40-44	187,444	191,233	378,677
45-49	174,164	177,760	351,924
50-54	158,572	163,673	322,245
55-59	145,292	146,503	291,795
60-64	110,483	110,498	220,981
65-69	90,711	95,697	186,408
70-74	76,119	84,161	160,280
75-79	62,845	78,395	141,240
80-84	39,299	59,764	99,063
85+	23,888	52,294	76,182
<b>Total</b>	<b>2,448,921</b>	<b>2,514,049</b>	<b>4,962,970</b>

Source: Australian Bureau of Statistics. Estimated resident population by sex and age: states and territories of Australia. (Cat. No. 3201.0)

# Appendix II: Methods

The Victorian Cancer Registry (VCR) became population based in 1982. Its detailed operations have been described elsewhere<sup>3</sup>. Briefly, notification of cancer in Victoria is a legal requirement of all hospitals and pathology laboratories, and all death certificates are notified to it by administrative arrangement. The VCR collects data on all primary invasive cancers, excluding non-melanocytic skin cancers, for persons residing in Victoria, Australia<sup>4</sup>. Information collected includes case demographics, type of cancer using both ICD-10-AM and ICD-O-3 topography codes, cancer morphology using the Berg classification system<sup>5</sup> and tumour laterality for paired organs.

The VCR has a policy of recording all primary cancers (i.e. those that are neither an extension, nor a recurrence, nor a metastasis of a pre-existing tumour), and all suspected further primaries are rigorously followed up with the hospital notifiers and with relevant clinicians and pathologists. If there is any doubt as to its validity, the notification is not coded as a primary cancer.

We evaluated the risk of second primary cancers following an initial diagnosis of cancer between 1982 and 2004 from a population-based cohort of cancer survivors from the VCR. All cancers occurring in patients diagnosed with multiple primary invasive cancers between 1982 and 2004 were coded according to the International Association of Cancer Registries (IACR) and the International Agency for Research on Cancer (IARC) guidelines<sup>6</sup>. All second primary cancers occurring in the opposite of paired organs as well as second primary cancers occurring in the same (ipsilateral) side were included. In situ tumours and non-melanocytic skin cancers of the perianal, perineal and genital skin were excluded from the analysis.

## Statistical Methods

A person-years approach<sup>7</sup> was used to calculate the risk of any subsequent (second, third, or later) primary cancer for Victorians diagnosed with a primary cancer that was registered as an incident case by the VCR between January 1, 1982 and December 31, 2004. Overall Victorian incidence rates were calculated including all synchronous and metachronous primary cancers considered to be 'incident tumours' according to IARC rules<sup>8</sup>.

Person-years at risk (PYR) for the cohort of Victorians diagnosed with cancer were accrued from the date of diagnosis of the first primary cancer until the date of death or end of study (31 December 2004), whichever occurred first.

The VCR database was searched to determine the observed number (Obs) of second metachronous primary cancers. The expected number of second primary cancers was calculated by multiplying the PYR by the incidence rates for the general population stratified by age at initial diagnosis (5-year age groups) and calendar year. The ratio of observed to expected second primary cancers was computed as the standardised incidence ratio (SIR), which represents the relative risk of any second primary cancer. The 95% exact confidence intervals for each SIR was calculated using Stata's immediate command<sup>9</sup>. Excess attributable risk (EAR), which is a measure of the excess cancer cases per 10,000 PYR, was also computed. The EAR was calculated as the difference of observed rate and expected rate of second cancers expressed per 10,000 person years. Further analysis, stratified the SIRs and EARs by age group at initial diagnosis and by years since diagnosis (less than 1 year, 1 to 5, 5 to 10, 10 to 15 and 15 to 23 years).

Cumulative risk (incidence risk), the percentage of cancer patients developing a second metachronous primary cancer within a specified time period was computed with adjustment for the competing risk of death, at 1, 5, 10, 15, 20 and 23 years since diagnosis<sup>10</sup>.

All statistical analyses were performed using Stata version 9<sup>9</sup>.

# Appendix III:

## References

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