

Population health concepts in cancer control

Aim

The aim of this module is to develop your understanding of key principles and concepts fundamental to specialist cancer nursing practice. The module focuses specifically on developing an advanced understanding of key population health concepts relevant to cancer control. The module focuses specifically on epidemiological concepts and the implications of epidemiological data for nursing's contribution to cancer control efforts in Australia and globally, as well as cancer prevention and cancer screening programs.

Rationale

A population health approach to cancer control focuses on efforts to reduce both the incidence of the disease as well as associated morbidity and mortality. These efforts occur at all stages of the cancer journey, including prevention, early detection, diagnosis and treatment, survivorship and palliative care.

Cancer epidemiology, or the study of the distribution and determinants of the disease, provides important knowledge to guide cancer control efforts.

Specialist cancer nurses require an understanding of core concepts in cancer epidemiology, to enable them to contribute to evidence based cancer control activities at all stages across the cancer journey. Specialist cancer nurses also contribute to collection of core cancer related data necessary for monitoring trends in the disease, and evaluating outcomes from cancer control efforts.

Based on an understanding of epidemiological data relating to cancer, specialist cancer nurses play an important public education role to reduce modifiable risks for developing cancer, and contribute to population based cancer screening programs.

Key concepts

- Components of cancer control programs
- Cancer control priorities in Australia
- Basic epidemiological concepts
- Core cancer data sets and their uses in cancer control
- Cancer data sources in Australia and internationally
- Trends in incidence, mortality and survival data for major cancers in Australia and internationally
- Patterns of cancer occurrence according to age, socio-economic factors, ethnicity and gender
- Cancer risk factors
- Cancer prevention
- Cancer screening.

Objectives

On completion of this supporting resource, you should be able to:

1. Outline the key components and the role of specialist cancer nurses in a comprehensive national cancer control program.
2. Discuss cancer control priorities in Australia.
3. Discuss the role of epidemiological and core clinical data in cancer control efforts, including in specialist cancer nursing practice.
4. Identify cancer data sources in Australia and internationally.
5. Analyse trends in incidence, mortality and survival for frequently occurring cancers.
6. Describe patterns of occurrence of cancer amongst differing socio-demographic groups.
7. Identify risk factors for the most frequently occurring cancers in Australia.
8. Explain cancer prevention and cancer screening policy and programs in Australia.
9. Apply an understanding of population health concepts to reduce risks and promote early detection of cancer.

Learning activities

At times, you will have learning activities to complete. Click on the learning activities button and a list of questions will pop up. The questions will relate to the content you've just read or the video you've just watched.

Resource links

Resource links are included throughout the resource. These links lead to interesting articles or websites, and are designed to encourage you to explore other available resources.

PDF of EdCaN module: Population health concepts.

You can download a PDF version of the module.

Suggested citation:

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The epidemiology of cancer

Epidemiology is the study of the causes, distribution, and control of disease in populations.¹

An underlying assumption of epidemiology is that diseases and health outcomes are *multifactorial*, caused by many different variables or factors. These independent variables, which may include the health behaviour, toxic substance, or other event or material a person encounters or experiences are identified as the *exposure*. An *outcome* can be a disease or other health outcome or health behaviour. An epidemiologist investigates the relationship between the *exposure* and the *outcome* of interest and how the exposure changes the chance someone will experience the outcome.²

The second underlying assumption in epidemiology is that health outcomes are not randomly distributed in a population. The multiple factors that cause a disease are measurable and identifiable.² The information from epidemiological research therefore provides a factual basis for the development of rational public health policies for cancer control.

Key principles of epidemiology:²

- Focus on the health of groups of people
- Used to describe where, when and to whom a health event occurs
- Used to quantify the amount of risk associated with a particular exposure or behaviour.

Common epidemiological terms¹⁻³

Incidence	The number or frequency of new health outcomes or health events over time
Incidence rate	The rate at which new events occur in a population in a defined period divided by the population at risk (usually expressed as annual rates per 100000 population)
Prevalence	The proportion of a population that actually has the disease (outcome) at a specific point in time. Calculated by dividing the number of existing cases by the total population at risk of the health outcome at a given point in time.
Mortality rate	The number of a population that dies in a specified period, divided by the population at risk (usually expressed as annual rates per 100000 population)
Survival rate	The proportion of survivors in a particular cohort, after a specified period of time (often measured over 5 years)
Relative survival rate	The proportion of survivors in a particular cohort adjusted for other causes of death.
Age-standardised incidence / mortality rates	Summary measures which allow comparison of populations with different age distributions, either different populations at the same time or the same population at different times.
Risk factor	Any personal attribute, environmental exposure, or other feature of a person or his or her environment that increases the likelihood that he or she will experience a given health outcome.
Protective factors	Any of the same types of variables (for risk factors) that reduce the chance a given outcome will occur.

The profile of cancer

For effective planning and efficient use of resources in cancer control activities, information on the burden of cancer on the community is required. There is a need to know how cancer and its risk factors affect different population sectors, how it is being managed, the gaps that exist in service availability, and the impacts of policy initiatives on outcomes. ⁴

Cancer Data Sources

The National Cancer Data Strategy provides a framework of strategies and activities which provide direction for collaborative efforts to increase data availability, consistency and quality.⁴ Currently in Australia, data collection is mandatory at diagnosis (incidence) and at death (mortality). Further rigorous processes for data collection, monitoring and availability are required for broad population health surveillance and research, and to improve cancer prevention, screening, treatment, and support for people affected by cancer, including caregivers.⁴

Increased data availability has been raised as a priority for:⁴

- monitoring and evaluating cancer service delivery, including assessing patterns of care and outcomes of care in response to policy change
- assessing the cost-effectiveness of alternative service models and treatment pathways
- determining the effects of introducing new technologies.

Better data availability is being sought to monitor:⁴

- quality of life, function and other aspects of survivorship after cancer treatment
- intermediate and long-term toxicity and other late effects, especially of new treatments
- consumer views on service needs, access and satisfaction with service provision.

Common data sources in Australia include:^{4, 5}

- State and territory population-based cancer registries - Australian Cancer Database (AIHW)
- Australian Paediatric Cancer Registry (APCR)
- Clinical cancer registries
- Biospecimen databases
- Cancer screening registries.

The cancer data collection points across the cancer trajectory and the data needs which they aim to meet are summarised in Figure 1: Australian cancer data needs and sources along the cancer pathway.⁵

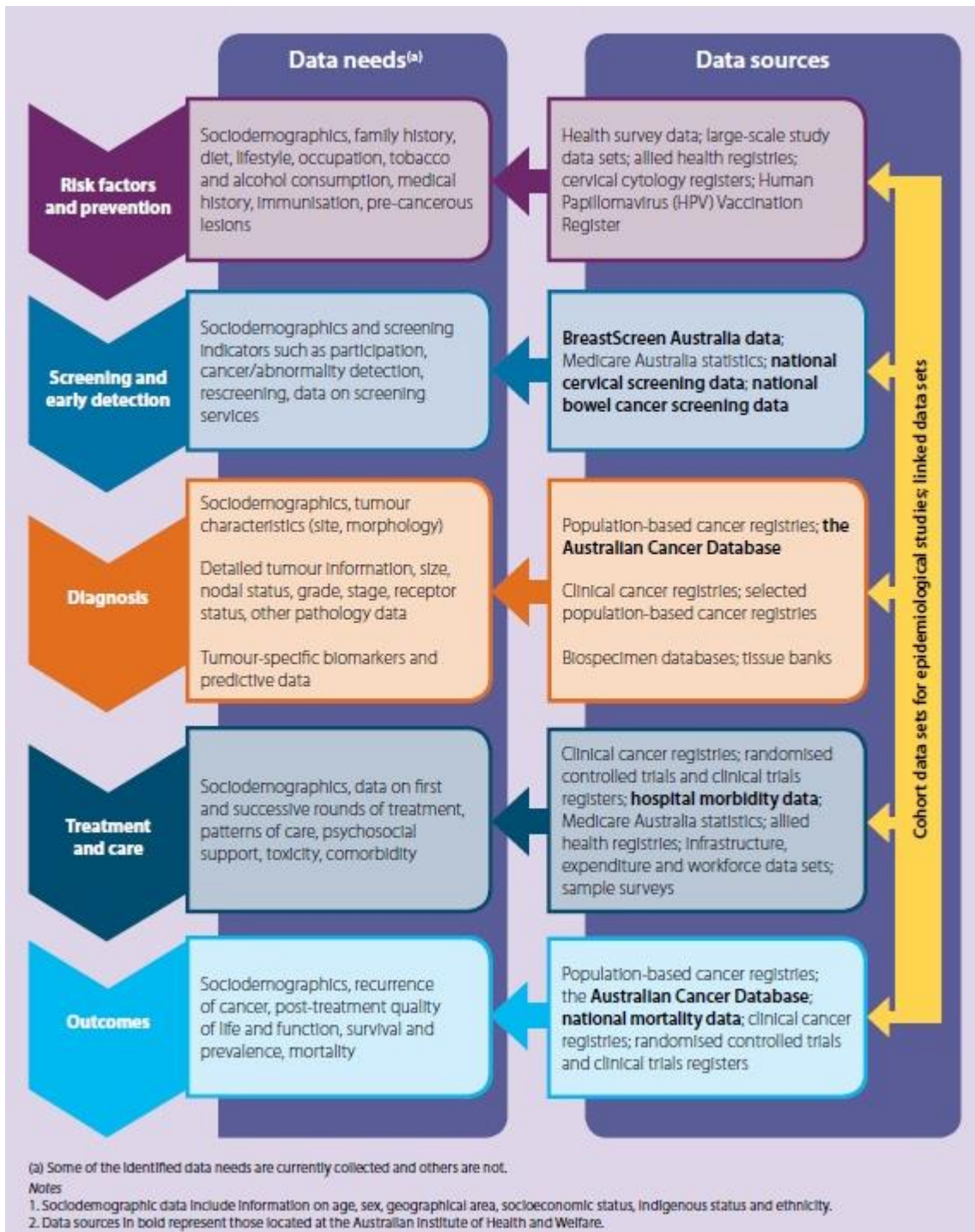


Figure 1: Australian cancer data needs and sources along the cancer pathway⁵

The National Centre for Monitoring Cancer (NCCM) was established in 2009 to respond to perceived gaps in service and aims to provide accessible, policy-relevant national information for evidence-based decisions across the cancer pathway.⁵ NCCM have developed a conceptual model of the cancer data cycle (Figure 2). The cycle illustrates how data are collected and analysed to form information and evidence, which in turn are transformed into knowledge to guide decisions towards better health outcomes which can be further measured by data.⁵

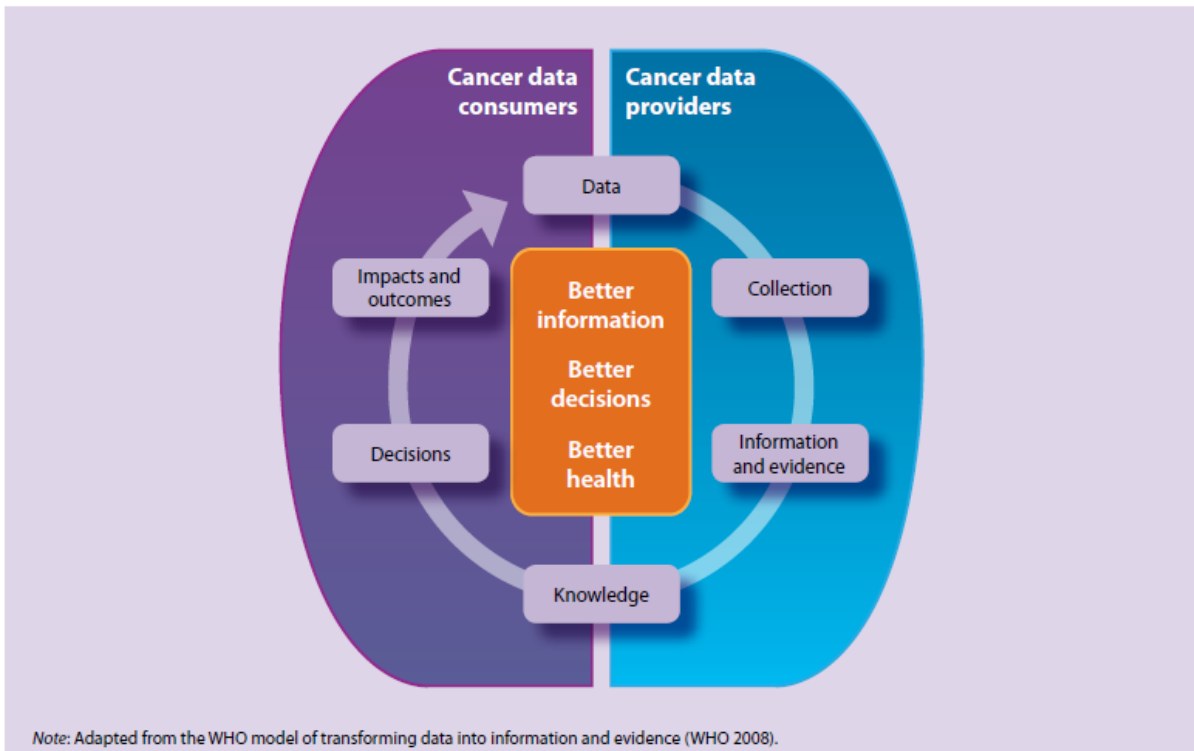


Figure 2: A conceptual model of the cancer data cycle⁵

Learning activities	
Completed	Activities
<input type="checkbox"/>	1. Access the National Centre for Monitoring Cancer Framework ⁵ and review Table 2.1 Summary of the most common Australian cancer data sources. <ol style="list-style-type: none"> For a diagnostic group in your care setting, summarise the data which is collected and how that information may be used. Discuss how such epidemiological data can be used by nurses in planning and delivering care to these individuals.
<input type="checkbox"/>	2. Access A National Cancer Data Strategy for Australia ⁴ and describe how data has been used in cancer control activities in your local / regional area by policy makers, planners, administrators and/or service providers.
	3. Access the Australian Institute of Health and Welfare (AIHW) data on age-standardised incidence rates by Primary Health Network, and compare rates of all cancers, and selected cancer types, across primary health network regions in Australia.

Cancer Incidence, Mortality and Survival in Australia

Cancer is the leading cause of the total burden of disease and injury in Australia. The following information provides a summary of the national statistics related to cancer in Australia using data from the Australian Institute of Health and Welfare. (Source: [Cancer in Australia statistics](#). Cancer Australia, 2017) ²⁹

Incidence:

- In 2013, there were 124,465 new cases of cancer in Australia (68,936 new cases in men and 55,529 new cases in women).^{7, 29}
- In 2017, about 134,174 Australians are expected to be diagnosed with cancer (72,169 men and 62,005 women). An estimated 149,990 are expected to be diagnosed in 2020.^{8, 29}
- In 2017, the risk of developing cancer before the age of 85 years is 1 in 2 in both men and women.²⁹
- Cancer is more common in older Australians:
 - in 2013, 74.6 per cent of new cancer cases were diagnosed in men aged 60 years and over; and 64 per cent in women aged 60 years and over.²⁹
- Cancer is more common in men:
 - in 2013, the age-standardised incidence rate of cancer was 562 cases per 100,000 men, compared with 416 cases per 100,000 women.²⁹
- Between 1982 and 2013, the number of new cancer cases in Australia more than doubled (from 47,388 to 124,465 cases).²⁹
- While cancer incidence rates have increased (from 382.8 to 470 cases per 100,000 between 1982 and 2013), cancer mortality rates have fallen (from 209.0 to 162 deaths per 100,000 between 1982 and 2014).²⁹
- In 2017, the five most commonly diagnosed cancers in Australia are expected to be breast cancer (17,586), colorectal cancer (16,682), prostate cancer (16,665), and melanoma (13,941 cases).^{7, 10}
- In 2013, prostate cancer was the most commonly diagnosed cancer among men and breast cancer was the most commonly diagnosed cancer among women.²⁹

Variations between population groups

from 2008 to 2012, the age standardised incidence rate of all cancers combined was:

- higher for Aboriginal and Torres Strait Islander Australians than their non-Indigenous counterparts (484 and 439 per 100,000 respectively) (New South Wales, Victoria, Queensland, Western Australia and the Northern Territory).
- from 2008 to 2012, the age standardised incidence rate of all cancers combined was higher for people living in lower rather than higher socioeconomic status areas.⁹
- from 2008 to 2012, the age standardised rate of all cancers combined was highest in Inner regional areas (516 per 100,000) and lowest in very remote areas (462 per 100,000).⁹

Mortality

- In 2014, there were 44,171 deaths due to cancer.⁷
- The age-standardised mortality rate for cancer is higher for men:
 - in 2014, there were 200.4 deaths per 100,000 men from cancer, compared with 131.6 deaths per 100,000 women.⁷
- Between 1982 and 2014, the age-standardised mortality rate for cancer has decreased from 209.0 deaths per 100,000 in 1982 to 161.9 deaths per 100,000 in 2014.⁷
- In 2017, the risk of dying from cancer before the age of 85 is estimated to be 1 in 4 for men and 1 in 6 for women.⁷

- In 2012, the leading cause of cancer death was lung cancer (8,137), followed by bowel cancer (3,980), prostate cancer (3,079), breast cancer (2,819) and pancreatic cancer (2,524).^{7, 10}

Survival

- For 2009–2013, five-year relative survival for all cancers combined in Australia was 68 per cent.¹²
- Relative survival rates for cancer was slightly higher for women than for men:
 - in 2009–2013, five-year relative survival for all cancers combined was 68.7 per cent for women and 67.5 per cent for men.¹²
- Relative survival rates for cancer have increased in recent years:
- between the periods 1982–1986 and 2009–2013, five-year relative survival increased from 48 per cent to 68 per cent.¹²

Prevalence

- At the end of 2012, there were 994,605 people in Australia who were diagnosed with cancer in the previous 31 years (4.3% of the Australian population), including 410,530 diagnosed in the previous 5 years.⁹

Learning activities	
Completed	Activities
<input type="checkbox"/>	1. Access Cancer in Australia: an overview 2017 ⁹ Summarise the reported disparities in incidence and mortality in one of the population groups identified. <ul style="list-style-type: none"> a. Identify factors which may be contributing to these differences. Consider environmental, lifestyle and health system factors.
<input type="checkbox"/>	2. Outline the implications of these inequalities for health policy and nursing practice.
<input type="checkbox"/>	3. Access the Australian Cancer Incidence and Mortality (ACIM) books and compare current data for “All cancers” and a diagnostic group you care for. <ul style="list-style-type: none"> a. Number of total cases. b. Risk of diagnosis before age 75. c. Average annual rate of change in incidence. d. Mortality rates.

Cancer Trends

Cancer Incidence Projections 2011 to 2020:⁸

- 40% increase in number of cases from 2007 to 2020 due to ageing and increasing population
- Most common cancers in 2020:
 - Males – prostate, bowel and melanoma, lung
 - Females – breast, bowel, melanoma and lung.

Increased rates are expected for:

- Liver cancer - 38% in males, 78% in females
- Thyroid cancer – 33% in males, 62% in females
- Melanoma – 30% males
- Testicular cancer – 25%
- Lung cancer – 16% females.

Decreased rates are expected for:

- Stomach – 25% in males, 20% in females
- Bladder – 19% males
- Lung – 15% males
- Pancreatic – 14% males.

Learning activities

Completed



Activities

1. Identify factors which are likely to be contributing to the trends reported. Consider social, behavioural and environmental changes as well as developments in science and technology.

Risk factors for cancer

Whilst the causes of most cancers are not fully understood, some well recognised factors place individuals at risk for cancer. Risk factors for cancer include non-modifiable factors such as age, race and gender and modifiable factors such as tobacco use, obesity, inadequate nutrition and physical activity; exposure to ultraviolet radiation and occupational carcinogens and alcohol consumption.^{13, 14}

- The Australian Institute of Health and Welfare (AIHW) estimated that 32.9% of the cancer burden (years of life lost to premature death and disability) in Australia in 2003 was due to 10 modifiable risk factors predominantly linked to lifestyle.¹³
- Tobacco smoking was estimated to directly cause 11.1% of new cases of reportable cancers and nearly 20.4% of all cancer deaths in Australia in 2003.¹³
- It is estimated that 5% to 10% of the common cancers are due to a familial or inherited tendency.¹³

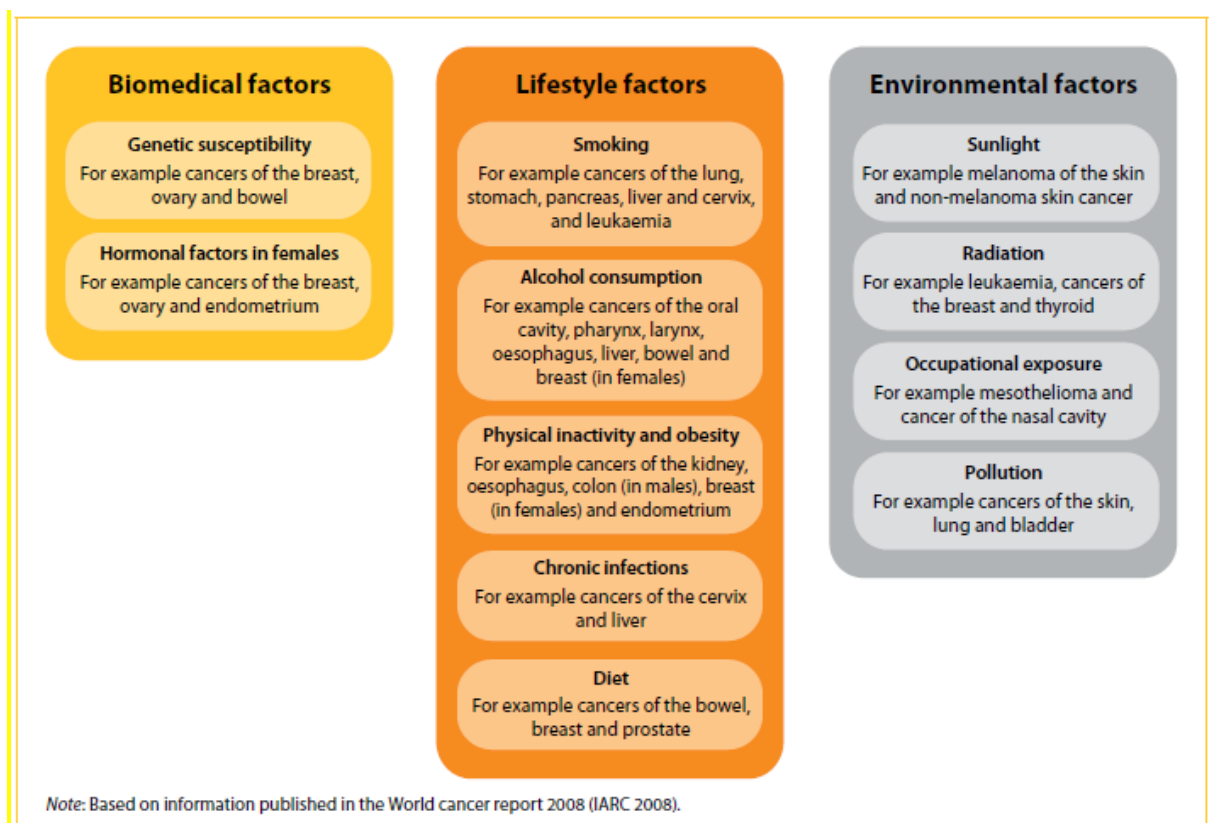


Figure 3: Risk factors for cancer¹⁵

Resource links

[National Cancer Prevention Policy](#). Cancer Council Australia, 2014¹⁴

Cancer Council Australia eLearning courses:

- [Working indoors – a SunSmart balance for vitamin D and skin cancer prevention](#) (free resource, requires login).
- [kNOw asbestos in your home](#) (free resource, requires login).

Learning activities

Completed

Activities

1. Select a commonly occurring cancer in Australia. Summarise the evidence available for factors implicated in increasing risk of developing this cancer.

2. Access the [Familial Risk Assessment FRA-BOC¹⁶](#) on-line tool.
 - a. If you are female, complete a self-assessment with the tools.
 - b. Describe the role of such tools in cancer risk reduction.

Cancer Control policy

Cancer has been a prominent policy issue in Australia for decades. In 1996, cancer control was declared a National Health Priority Area by Australian health ministers in an initiative to focus public attention and health policy on areas which contributed significantly to the burden of disease in Australia and for which there is potential for health gain.¹³ Major initiatives over the last 15-20 years have included:¹³

- introduction of organised screening programs for cervical, breast and colorectal cancers
- development of the [National service improvement framework for cancer](#)¹⁷
- establishment of the National Breast and Ovarian Cancer Centre and Cancer Australia
- development and implementation of cancer control plans and strategies in most jurisdictions
- widespread promotion of evidence based care, supported by national evidence-based guidelines for prevention, screening and treatment for the most frequently encountered cancers.

Cancer Australia is an Australian Government agency established to provide national leadership in cancer control. It aims to reduce the impact of cancer on the Australian community and to lessen the divide in outcomes for groups of people with cancer whose survival rates or cancer experiences are poorer. Cancer Australia was established to:¹³

- Coordinate and liaise between the wide range of organisations, groups and service providers with an interest in cancer care and support
- Guide improvements in cancer prevention and care
- Ensure treatments are based on the best available evidence
- Make recommendations to the Australian Government about cancer policy and priorities
- Work with the research community to develop and fund research programs for improving cancer prevention and care
- Help implement Australian Government policies and programs in cancer control

The following issues have been identified for current cancer control initiatives in Australia:⁴

- Continuing challenges to
 - prevent more cancers
 - diagnose cancers earlier
 - treat cancers more effectively
- Efforts must be distributed equally across different population subgroups
- Recognition that the growing and aging population is expected to lead to a greater impact on the health care system.

The Council of Australian Governments (COAG) introduced a new set of health performance indicators (PIs), which aim to report on the goals of the health system and reflect the roles and responsibilities of governments in managing and providing health services. Australian and state and territory health authorities have committed to regularly report on these performance indicators and benchmarks, five of which relate to cancer and are reported by the AIHW. The five cancer-related performance indicators are:⁵

- incidence of selected cancers (PI 4)
- 5-year relative survival of people diagnosed with cancer (PI 44)
- screening participation rates for cervical, breast and bowel cancer (PIs 10, 11 and 12, respectively).

Learning activities

Completed	Activities
<input type="checkbox"/>	1. Access the National service improvement framework for cancer ¹⁷ and complete the following: <ol style="list-style-type: none">Identify the Critical Intervention Points to “Reduce risk” and “Find Cancer early”.Briefly describe the rationale for including these as priority actions.Describe the role of nurses in contributing to initiatives within these Critical Intervention Points.
<input type="checkbox"/>	2. Access your relevant state or territory cancer plan and summarise the key priorities and initiatives.

Cancer control: prevention and early detection

The role of prevention in cancer control is not solely economic, but also humanitarian and ethical, in recognition of current estimates that one-third of cancer is preventable.¹³

The Ottawa Charter was a landmark document created by the World Health Organisation (WHO) which reoriented health care systems towards primary health care and health promotion. The charter advocates that health promotion action must occur on five fronts including:¹⁸

- building healthy public policy.
- creating supportive environments.
- strengthening community action.
- developing personal skills.
- reorienting health services.

Consistent with the principles of the Ottawa Charter for health promotion¹⁸, successful approaches to cancer prevention require a multi-focal approach that addresses broader issues of public policy, the environment, community action and health services as well as micro-level issues such as the development of personal skills. The charter emphasises the interrelationship of all of these aspects of health promotion.

There are many factors that influence whether a person will participate in prevention activities. A number of models and theories have been developed to explain health behaviour including Social Learning Theory, Health Belief Model, Theory of Reasoned Action and the PRECEDE model of health education.¹⁹ A key publication by Cummings et al (1980) identified six categories of variables influencing health behaviour:²⁰

- Attitudes toward health care benefits and health care quality
- Perceptions of symptoms and beliefs about susceptibility to illness
- Accessibility of health services
- Knowledge of health services
- Social support characteristics
- Demographic variables (particularly social status, income and education).

It has been identified that behavioural change efforts need to focus on common models that emphasise the skills needed for behavioural change, diverse and sustained interventions, and social and other forms of support for the maintenance of behavioural changes. An approach involving well defined interventions delivered to individuals, such as counselling and prescription drugs for smoking cessation and comprehensive, multi-component programs directed to large groups such as state-wide tobacco control programs has been advocated.¹⁹

Resource link

Cancer Forum, March 2012, Vol 36 Issue 1, [Cancer Prevention](#)

Learning activities

Completed

Activities

1. Access the webpage [The Ottawa Charter for Health Promotion](#) and:
 - a. Outline three examples of how the Ottawa Charter for Health Promotion can be applied in the area of cancer control?
 - b. Identify potential benefits of taking a primary health care approach to cancer control. In your response, provide examples from your understanding of existing efforts in cancer control.
2. Reflect on your own lifestyle and identify areas where you consider you have adopted health-promoting behaviours and areas where you consider you have not. Identify the factors which influence whether or not you adopt health promoting behaviours?
3. Access [The conceptual framework of the International Tobacco Control \(ITC\) Policy Evaluation Project](#)²¹ and discuss how the international approach to a public health issue has had positive influence on health behaviours.
4. Access the [AIHW's Chronic Disease and Risk Factors page](#) and consider the behaviour change education you could provide to patients at risk of any of the conditions listed.

Primary prevention

Primary prevention of cancer attempts to limit exposure to carcinogens in order to prevent the initiation or promotion of cancer. Cancer prevention strategies to modify cancer risk factors involve lifestyle interventions and medical interventions which include chemoprevention and vaccines.²²

Key areas of primary prevention addressing modifiable risk factors through lifestyle interventions in Australia are focused on:¹³

- Tobacco smoking
- Sun exposure
- Physical activity, body mass and nutrition
- Alcohol
- Occupational exposure
- Viral and bacterial infections.

There is strong evidence of the association between viruses such as human papillomavirus (HPV) and hepatitis B virus (HBV) and the development of malignancies. The administration of prophylactic vaccines to protect against cancer-causing viruses is appropriate if:²²

1. A microorganism is the known etiologic source of cancer.
2. Vaccination can effectively prevent infection from the microorganism.
3. Prevention of infection by the microorganism can prevent cancer from developing.

Key initiatives in Australia include the universal infant hepatitis B vaccination program and HPV vaccination program.¹³

Chemoprevention is an emerging area of primary prevention undergoing rigorous research through clinical trials. Chemoprevention refers to the use of natural or synthetic agents to interrupt the carcinogenic process, preventing progression to invasive cancer. In comparison to population-based lifestyle interventions, chemoprevention focuses more narrowly on individuals or subpopulations known to be at increased risk for developing a malignancy.²² Aspirin is one agent which has shown promise in decreasing colon cancer.^{22, 23}

Learning activities

Completed

Activities

1. Access the [National Cancer Prevention Policy](#)¹⁴ and for one modifiable risk factor:
 - a. Summarise the evidence regarding the need to modify risk.
 - b. Outline the cancer prevention initiatives in Australia to address this risk factor.

Secondary prevention of cancer

Secondary prevention strategies use screening and early detection programs in an attempt to identify cancer early in its development, to reduce the morbidity and mortality by improving the outcome of disease that has already developed.³ Population screening differs from opportunistic screening or diagnostic screening. For example, screening mammography is used to detect lesions in 'well' women who do not have symptoms, with the emphasis on 'benefit to the population'. Diagnostic screening is done when a woman presents with symptoms, thus benefitting the individual.

The Australian Government has developed a [Population Based Screening Framework](#), based on the World Health Organization (WHO) principles of screening. The aim of the Screening Framework is to provide guidance for decision makers when considering potential population based screening programs in Australia.²⁴ Population-wide screening programs currently exist in Australia for the early detection of breast, cervical and bowel cancers. There is evidence to suggest an association between reduced breast cancer mortality and the introduction of the BreastScreen Australia program and the extremely low cervical cancer mortality rate is attributed to the effectiveness of the National Cervical Screening Program.²⁴ Disparities in the screening and mortality rates for women from Aboriginal and Torres Strait Islander and culturally and linguistically diverse backgrounds indicate that a range of further initiatives are required to engage these groups.²⁴

Resource link

[Principles of screening](#). National Cancer Prevention Policy, Cancer Council Australia, 2014¹⁴
[Population based screening framework](#). Australian Population Health Development Principal Committee Screening Subcommittee, 2008.²⁴
[Early detection of cancer](#). World Health Organisation, 2012.

Learning activities

- | Completed | Activities |
|--------------------------|--|
| <input type="checkbox"/> | 1. Access the cancerscreening.gov.au website , and: <ol style="list-style-type: none">Summarise how one of the current national screening programs (e.g., breast, cervical, or colon) meets the requirements for a population screening program.Summarise strategies used within one of the screening programs to promote equitable access for all population groups. |
| <input type="checkbox"/> | 2. Access the EdCaN colorectal cancer case based learning resource, John's story 2: screening , and complete the associated learning activities. |
| <input type="checkbox"/> | 3. Access the EdCaN prostate cancer case based learning resources; Early detection and Screening for men at above average risk , and complete the associated learning activities. |

Familial aspects of cancer and genetic testing

Whilst all cancers develop as a result of gene mutations, not all of these mutations are inherited from a parent. The majority of cancers are thought to be sporadic, occurring in individuals as a result of aging, and / or environmental exposures.

Resource link

[Cancer Australia. \(2015\) EdCaN Module: The biology of cancer.](#)

Hereditary cancers are attributable to changes in specific genes that are passed from a parent to their offspring. Individuals with these germline mutations associated with a high probability of cancer development will have a higher likelihood of developing cancer within their lifetime than individuals who have not inherited the mutation. Approximately 5% to 10% of all cancers are hereditary.²⁵ Known hereditary cancer syndromes and their associated malignancies are summarised below:²⁵

Hereditary Cancer Syndrome	Major associated malignancy	
Hereditary breast and ovarian cancer	Breast Ovary	Fallopian tube Prostate
Hereditary colon cancer syndromes	Colorectal Endometrial Gastric Biliary tract	Urinary tract Ovarian Small bowel
Familial adenomatous polyposis	Colon adenocarcinoma Duodenal carcinomas Thyroid	Brain Childhood hepatoblastoma
Cowden syndrome	Breast Thyroid	Endometrial Renal
Li-Fraumeni	Osteogenic and chondrosarcoma Rhabdomyosarcoma Breast	Brain (glioblastomas) Leukaemia Adrenocortical carcinoma

A *familial cancer* pattern is characterised by an increase in the number of cancers within a family, more than what is expected by chance alone.²⁵ Familial cancers may be associated with chance clustering of sporadic cancer cases within families, genetic variation in lower penetrance genes, a shared environment, or combinations of these factors.²⁶

The SCN can be involved in cancer risk assessment and cancer risk counselling or referral to appropriate services. There are significant complex issues related to genetic risk assessment counselling and testing. A number of clinical guidelines and standards have been developed to support clinicians in this field.^{26, 27}

Resource link

[Familial Risk Assessment - Breast and Ovarian Cancer](#), Cancer Australia. 2014

[Genetics & risk](#). Cancer Council Victoria

[Family cancer resources](#). Cancer Council Australia

[Cancer](#). Health Centre for Genetics Education

[Cancer Genetics](#). eviQ

[Genetic / Familial High-Risk Assessment: Breast and Ovarian](#). National Comprehensive Cancer Network, 2014.

[Familial aspects of bowel cancer: a guide for health professionals](#). Australian Cancer Network, 2008²⁷

Learning activities

Completed

Activities

1. Access the following EdCaN ovarian cancer case based learning resources, and complete the associated learning activities:

- [Familial aspects of ovarian cancer](#)
- [Janes story 1: Meet Jane](#)

References

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