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In this section, eight cancer types are outlined briefly as a way of contextualising the analysis and highlighting cancer types that are important in Australia – either because of their public health programs or because of large incidence or mortality percentage changes – to illustrate how policy, programs or other changes may have affected these measures. These have been selected based on a combined list of the top five cancer sites for males and females in incidence and mortality according to IARC GLOBOCAN 2008 working estimates, and cancer types of national importance in Australia.

Firstly, trends in incidence and mortality for the cancer type are described – including data from the IARC GLOBOCAN project to illustrate global incidence and mortality working estimates for 2008 in individuals aged 74 years and under. Additionally, the most current survival data available for Australia from the AIHW are also provided. The AIHW survival data are presented to provide context rather than to facilitate a comparison between survival trends and our findings. However, the AIHW data were only available for all ages combined. The relative survival and five-year conditional relative survival data reported by the AIHW show the probability of surviving a given number of years, provided that an individual has already survived a specific amount of time after diagnosis.

A brief overview of current prevention strategies, screening programs and treatment methods in use globally and in Australia are also provided. The results of our analysis for the specific cancer type are then presented and discussed.

References
7.6 Melanoma (C43)

7.6.1 Background
Skin cancer is divided into non-melanoma and melanoma of the skin. Non-melanoma skin cancer is the most common form of skin cancer; however, new cases are not routinely registered in many countries and it is not often a life-threatening disease. On the other hand, melanoma of the skin has greater potential for metastasis, and thus can be more fatal if not diagnosed early. This section focuses on melanoma of the skin, which is recorded in Australian cancer registries.

Of the 160,000 new cases of melanoma each year worldwide, approximately 80% are in individuals from North America, Australia and New Zealand. IARC GLOBOCAN 2008 working estimates state that the incidence of melanoma of the skin in males and females under the age of 75 was 2.6/100,000 and 2.4/100,000 respectively. Although not a cancer of overall global importance, incidence for all ages in Australia is high: 42.4/100,000 in males and 31.7/100,000 in females, making it a cancer of concern nationally. Overall, mortality rates are high, considering that this is a highly curable disease if detected and treated early. IARC GLOBOCAN 2008 working mortality estimates were 0.6/100,000 in males and 0.4/100,000 in females under 75 years of age. Melanoma appears to be more aggressive in males, with higher survival rates in females. Females have been found to have a lower risk of developing metastases than males.

Melanoma occurs in the melanocytes in the epidermis and is more common in fairer-skinned individuals. Individuals with darker skin pigmentation have higher levels of photoprotection against ultraviolet radiation from the epidermal melanin, resulting in lower incidence of melanoma. Physical symptoms of melanoma are naevi which can develop into pigmented lesions. Pigmented lesions often appear on the trunk, especially in males, or on the lower legs in females. The degree of risk associated with a melanoma is determined by its thickness. Melanoma skin cancer is visually recognisable, suggesting that screening could play an important role in early diagnosis.

In Australia, the prognosis for melanoma is good, with 91% relative survival for at least 5 years at diagnosis. The 5-year conditional relative survival was 92% for 1 year after diagnosis and rising to 100% 14 years after diagnosis. Survival varies greatly with the thickness of the tumour. A thicker tumour (more than 4 millimetres) has a 55% 5-year survival rate, in comparison to a 100% rate for thinner tumours.
7.6.1.1 Causes and risk factors

Environmental factors are the predominant cause of all types of skin cancer, suggesting its preventability through their adequate control. The major cause of skin cancer is ultraviolet radiation exposure resulting in direct cellular damage and modifications to immunologic function. However, no simple dose-response relationship between exposure and melanoma has been identified. Occupational exposure, childhood exposure and exposure during holidays in sunny locations have all been related to higher risk of skin cancer. There is recent evidence to suggest that not all exposure is the same and that type of exposure (ie recreational or occupational) and period of exposure in life are important factors to be considered. Purdue et al suggest intrinsic factors may also play a role in melanoma risk.

In the USA, incidence of melanoma is high in people of higher SES but their survival rates are higher, potentially increasing risk has not yet been described. Phototherapy, used to treat some cutaneous diseases, can result in higher morbidity from skin cancer. Individuals who have had melanoma in children who frequently used sunscreen, suggesting an association with reduced risk in melanoma.

Actinic keratoses are a common precursor to skin cancer, but are most commonly associated with squamous cell carcinomas. Individuals with acquired melanocytic naevi, or moles, are at higher risk of developing melanoma. Their development is highly influenced by sun exposure at a young age. Naevi, both melanocytic and dysplastic, are considered to be important independent markers of melanoma. Lower numbers of naevi were found in children who frequently used sunscreen, suggesting an association with reduced risk in melanoma.

Ultraviolet radiation exposure is essential for the development of vitamin D, important for bone health, but in excess can result in higher risk of skin cancer, especially in people with a light skin pigmentation. Vitamin D has also shown evidence of containing anticancer properties that could inhibit melanoma. The combination of harm and benefit associated with sun exposure can result in mixed public health messages that dilute the sun-safe practices commonly promoted. Ultraviolet radiation passing through after the application of sunscreen has been shown to be sufficient to produce levels of vitamin D that will prevent skin cancer.

Hormonal factors have not conclusively been associated with skin cancer. The development of skin cancer as a result of HRT use has been proposed but not conclusively proven for either non-melanoma skin cancer or melanoma. Other hormone-related medications or issues, including oral contraception and pregnancy, have not conclusively been associated with melanoma. However, there could be a protective factor that is present only in females, or a factor that promotes the development of melanoma in males, that could explain a proportion of the gender differences in survival.

The World Cancer Research Fund found probable evidence associating arsenic in drinking water to increased risk of skin cancer (both melanoma and non-melanoma). Other food products and supplements have not been conclusively linked to risk of melanoma.

The incidence of melanoma and non-melanoma skin cancer in females has been steadily increasing in the USA, partially attributed to the rising use of artificial tanning devices (i.e. tanning beds, sunbeds and solaria). Increased incidence resulting from tanning beds is predominantly cases of non-melanoma skin cancer, but is also associated with increased risk of melanoma. Sunbed use is most prevalent in young females, especially those whose parents are of a lower SES, and exposure at a younger age results in a higher risk of skin cancer. Risk in sunbed users is estimated to increase by approximately 20%. The tanning industry does not self-regulate and has been found to provide clients with information that does not accurately represent the associated risks.

In many nations, sunbed use has been restricted to over-18-year-olds and there have been calls for regulations to be changed where restrictions do not currently exist. A Danish study suggested that focusing anti-sunbed messages to preteens, specifically 14-year-olds, would be most effective.
7.6.1.2 International prevention/screening/treatment programs

Prevention of melanoma focuses on public education and modifying behaviour to encourage sun-safe practices.\textsuperscript{46, 299} Sun-safe programs include the use of sunscreen, seeking protective shade cover, and wearing protective clothing, a hat and sunglasses.\textsuperscript{46, 282} Although initially considered controversial, the use of sunscreen has been shown to reduce the incidence of skin cancer.\textsuperscript{300} In the 1990s, broad-spectrum sunscreen, which filtered out both ultraviolet A and B radiation, became widely available and used in Australia.\textsuperscript{47} This may result in future reductions in incidence and mortality.\textsuperscript{47}

As part of public health initiatives, individuals are advised to seek medical attention if any moles change colour or increase in size at any stage.\textsuperscript{46} New initiatives to change individual behaviour are being trialled, such as the use of text messages to promote healthy behaviours to improve prevention and early detection.\textsuperscript{301} Campaigns encouraging reduced sun exposure, increasing sun safe practices, and educating health care and education workers to be sun-smart are more effective if coupled with government policies mandating changes in physical environments and practices.\textsuperscript{46}

Although a commonly diagnosed cancer, no existing screening programs have been endorsed for skin cancer.\textsuperscript{282, 299, 302} In 2009, the US Preventive Services Task Force found that there was insufficient empirical evidence to support the beneficial outcomes of a screening program, and limited information on how a screening program could be integrated into usual care.\textsuperscript{302} Other nations, however, differ in their approach and have implemented pilot screening programs.\textsuperscript{303} In Australia, specialised clinics run by dermatologists became popular in the 1980s and 1990s, and have been suggested to be an effective method of screening.\textsuperscript{304-306} Self-examination, in conjunction with a visit to the general practitioner, has been shown to reduce risk.\textsuperscript{307} Currently work is being done to develop a computer-assisted digital analysis of pigmented lesions to aid in early diagnosis that could be developed into a population-wide screening program.\textsuperscript{277} In the USA, much of the associated cost (approximately 90\%) of melanoma is from individuals with advanced lesions.\textsuperscript{46, 288} Thus, earlier detection would reduce the health care system costs related to this disease.\textsuperscript{288, 307} The required evidence to support this from a randomised controlled trial would be costly and difficult to source, because of relatively low incidence and mortality rates.\textsuperscript{303, 305}

Treatment for melanoma of the skin is commonly surgery, with non-surgical methods used in adjuvant treatments.\textsuperscript{277, 308} For many years, the most common treatment for melanoma has been excision.\textsuperscript{277, 279} Melanoma can also be successfully treated with interferon alfa-2b, an antiviral drug.\textsuperscript{309} If untreatable by surgery, the BRAF inhibitor drug, dabrafenib, can be used to improve survival from melanoma with little toxicity.\textsuperscript{211} Melanoma has been classified as a radio-resistant disease, thus radiotherapy has not been used extensively in its treatment.\textsuperscript{308} However, radiotherapy has been shown to decrease risk of regional relapse, but does not improve survival.\textsuperscript{308} Emerging evidence suggests that treatment of melanoma with \( \beta \)-blockers within 90 days of diagnosis could improve survival.\textsuperscript{311}

7.6.2 Incidence and mortality rates in Australia 1987–2007

Mortality rates of melanoma of the skin have decreased marginally over the 20-year period, while incidence rates have increased (Figure 7–11 and Figure 7–12). There has been an 11\% reduction in mortality associated with melanoma of the skin and a 17\% increase in incidence (Table 7–11). This suggests that melanoma is still an ongoing concern, despite positive survival rates. Considering the extensive sun protection campaigns implemented in Australia, the 11\% decline in mortality over the study period seems low. This could be associated with broad-spectrum sunscreen use only starting the 1990s, and the delayed effect of childhood exposure.\textsuperscript{47} Studies including a more detailed age-specific incidence analysis found a fall in incidence in younger age cohorts.\textsuperscript{312, 313} Research has also shown a general positive change in behaviour and attitudes in younger generations.\textsuperscript{312-314}
The prognosis for melanoma of the skin is good, despite its life-threatening nature. Patients require ongoing, long-term monitoring, which can become demanding and require a shared-care model between health care professionals. Ongoing monitoring can help reduce anxiety associated with the prospect of recurrence. As with most cancer types, at diagnosis and post-treatment, patients’ quality of life is lower than the general population. However, it increases over time. Quality of life can decrease during treatment with drugs such as interferon alfa-2b, but then return to normal after treatment has ceased. A German quality-of-life study has shown that patients’ scores are comparable to the general population two years after diagnosis without recurrence. It has been suggested that providing sufficient information to patients regarding melanoma improves their quality of life significantly.

Initiatives in Australia, including the SunSmart Program; the Mole Patrol; Slip! Slop! Slap!; and Slip! Slop! Slap! Seek! Slide! have successfully raised awareness and improved behaviours – these programs are described in section 8.3.5.5.48, 49, 306 Modifying exposure to ultraviolet radiation could significantly reduce health care costs.45 A balance in sun exposure recommendations needs to be determined which takes into account both its vitamin D–related benefits and its harmful effects.45 This balance should be reflected in public policy and programs. Evidence of positive changes to individual behaviours as a result of Australian campaigns, and their cost-effectiveness, have seen them continue to the present day.

Skin cancer prevention in Australia is evolving. A skin cancer prevention policy has been developed in NSW to encourage the reduction of overexposure to ultraviolet radiation. Additionally, NSW and Victoria have planned legislation on the operation of solaria that will bring in a ban on all solaria by the end of 2014.
7.6 Melanoma (C43)

References


