

Screening and prevention

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Introduction

One third of cancer deaths could be prevented by lifestyle changes alone. Population screening for cancer can detect precancerous lesions or early cancer when it is curable surgically.^[1]

Tobacco

Tobacco causes 20.1% of Australia's cancer burden and nearly 21% of cancer deaths.^{[2][3]} It is responsible for 16 different cancers -- particularly lung, head and neck and bladder cancers. Just over 15% of Australians smoke daily, as do 47% Indigenous Australians.^[4] Price is the most effective tool for decreasing smoking when added to eliminating advertising (including on packs), mass media campaigns, smoke free work and public places and regulating supply. For those smokers who can't quit "cold turkey", nicotine replacement patches or gums are available.

Nutrition and physical activity

Appropriate nutrition and physical activity could prevent a quarter of cancers.^[5] Physical inactivity accounted for 5.6% of the total cancer burden, high body mass for 3.9% and low fruit and vegetable consumption for 2%.

Being overweight (BMI 25-30) or obese (BMI 30+) increases the risk of cancers of the oesophagus, pancreas, bowel, breast (post-menopausal), endometrium and kidney.^[6] One in four Australian adults is obese.

Physical activity independent of weight control has been shown to protect against bowel cancer and probably against post-menopausal breast cancer and endometrial cancer.^[6] Prolonged sedentary periods, irrespective of physical activity, increases the risk of bowel, endometrial, ovarian and prostate cancer. The World Cancer Research Fund dietary advice includes eating mainly fruit and vegetables and unprocessed cereals and pulses, and limiting the consumption of energy-dense food, sugary drinks, red meat (to 500 gm/wk), processed meats and salt. The usual recommendation for physical activity is at least 150 minutes over 5 sessions in a week, the more intense the better.^[7]

Alcohol

Up to 5.8% of cases of cancer in Australia have been attributed to the chronic use of alcohol.^[8] Starting at zero, the more consumed the greater the risk, irrespective of the type of drink. The NHMRC advises that alcohol consumption should not exceed 2 standard drinks each day.^[9] The related cancers include breast, mouth, pharynx and larynx, oesophagus, bowel and liver cancers.^[6] In head and neck and upper gastrointestinal cancers, tobacco has a synergistic effect.^[10]

UV radiation

Exposure to UV radiation is the major cause of skin cancer, with intermittent exposure linked more to melanoma and cumulative exposure to non-melanoma skin cancer. There are over 1800 deaths from skin cancer with around 1300 from melanoma.^[11] In Australia there are almost 12,000 cases of melanoma and estimations of over 400,000 non-melanoma squamous cell and basal cell skin cancers annually.^[12] Sun protection, by avoiding the sun when it is most intense in the middle of a summer day and covering up with hats, sunglasses and clothing supplemented by sunscreen (SPF 50+, broad spectrum and water resistant), is recommended when the UV index is 3 or above.^[13]

Occupational exposures

In 2006, it was estimated that 6.5% of cancer cases in Australia in 2005 could be attributed to workplace exposures (10.8% in men, 2.2% in women).^[14] Mesothelioma related to asbestos exposure is the best known. Other well established associations are between cadmium in electroplating and lung cancer, benzene and leukaemia and aromatic amine dyes and bladder cancer. The building industry has the highest occupation exposure, not only to silica and diesel exhaust but outdoor sun exposure.^[15] Relating occupational exposure to pesticides to cancer in particular occupations is difficult but studies show associations with lymphoma. Emerging concerns requiring research are manufacturing processes that involve nanoparticles.^[16]

Vaccines

Human papillomavirus (HPV) is necessary for the development of cervical cancer and there is a vaccination program for 12-13 year old boy and girls. Vaccinating against types 16 and 18 will reduce the incidence by 70%.^[17]

To prevent liver cancer, hepatitis B vaccination could be given to neonates or adults at high risk; such as IV drug users or those living in populations with a high incidence of hepatitis B infection.^[18]

Screening

There are 3 national screening programs for cancers of the cervix, breast and bowel. These are recommended because of the associated mortality reduction when weighed against overdiagnosis and its adverse effects.

Papanicolaou tests (Pap tests) for cancer of the cervix commencing with sexual activity and repeated every 2 years have halved the incidence of cancer of the cervix since their introduction in 1991.^[19]

Free screening mammography is encouraged for women from 50-74 years old and available for high-risk women from 40 years. There has been a 29% age-standardised decrease in breast cancer mortality compared to the decade before 1991, and we estimate at least half of that is due to screening.^[20]

The bowel cancer screening program was introduced in 2006 and aims to send faecal immunochemical testing kits to everyone from 50-74 years every 2 years by 2020, with the positives followed up by colonoscopy. Comparing screened with unscreened people there has been a halving in the presentation of stage 4 disease.^[21]

PSA testing is not recommended as a population screening test because a small survival gain is currently matched by widespread adverse effects stemming from overdiagnosis and overtreatment.^[22]

People are encouraged to get to know their skin lesions and promptly report any change rather than relying on formal annual skin checks. Likewise, promptly reporting symptoms and signs related to the testicles is recommended over regular screening examinations.^[23]

References

1. ↑ Cancer Council Australia. *Risk factors*. [homepage on the internet] Sydney: Cancer Council Australia; 2012 Sep 4 [cited 2014 May 7; updated 2012 Sep 4]. Available from: <http://www.cancer.org.au/policy-and-advocacy/prevention-policy/risk-factors/>.
2. ↑ Begg S, Vos T, Barker B, Stevenson C, Stanley L, Lopez AD et al. *The burden of disease and injury in Australia 2003*. Canberra: AIHW; 2007. Report No.: PHE 82. Available from: <http://www.aihw.gov.au/publication-detail?id=6442467990>.
3. ↑ AIHW. *Cancer in Australia: an overview, 2008*. AIHW; 2008 Dec 19 [cited 2014 May 8]. Report No.: Cat. no. CAN 42. Available from: <http://www.aihw.gov.au/publication-detail?id=6442468196>.
4. ↑ Cancer Council Australia's Tobacco Issues Committee. *Tobacco Control*. [homepage on the internet] Cancer Council Australia; 2013 Apr 1 [cited 2014 May 8; updated 2013 Dec 8]. Available from: http://wiki.cancer.org.au/prevention/Tobacco_control/Overview.
5. ↑ World Cancer Research Fund, American Institute for Cancer Research. *Policy and action for cancer prevention. Food, nutrition, and physical activity: a global perspective*. Washington, DC: American Institute for Cancer Research; 2009 Jan 1 [cited 2014 May 8] Available from: http://www.dietandcancerreport.org/cancer_resource_center/downloads/chapters/pr/Introductory%20pages.pdf.
6. ↑ ^{6.0} ^{6.1} ^{6.2} World Cancer Research Fund, American Institute for Cancer Research. *Food, nutrition, physical activity, and the prevention of cancer: a global perspective*. Washington DC: AICR; 2007 [cited 2014 May 20] Available from: http://www.aicr.org/assets/docs/pdf/reports/Second_Expert_Report.pdf.
7. ↑ Vainio H, Bianchini F. *IARC monographs on the evaluation of carcinogenic risks to humans, volume 6. Weight control and physical activity*. Lyon, France: International Agency for Research on Cancer; 2002 [cited 2014 May 20] Available from: <http://www.iarc.fr/en/publications/pdfs-online/prev/handbook6/Handbook6-0.pdf>.

8. ↑ Cancer Council Australia Public Health Committee - Nutrition and Physical Activity Subcommittee. *Alcohol and cancer: overview*. [homepage on the internet] Sydney: Cancer Council Australia; 2012 Apr 1 [cited 2014 May 20; updated 2013 Sep 3]. Available from: <http://wiki.cancer.org.au/prevention/Alcohol/Overview>.
9. ↑ National Health and Medical Research Council. *Australian guidelines to reduce health risks from drinking alcohol*. Commonwealth of Australia: NHMRC; 2009 Feb [cited 2014 May 20] Available from: <http://www.nhmrc.gov.au/guidelines/publications/ds10>.
10. ↑ Doll R, Forman D, La Vecchia C, Wouterson R. *Alcoholic beverages and cancers of the digestive tract and larynx*. In: Verschuren PM. Health issues related to alcohol consumption. Washington: DC: ILSI Europe; 1193 [cited 2014 May 20]. p. 125-66.
11. ↑ Australian Bureau of Statistics. *Causes of death, Australia, 2008*. Canberra: ABS; 2010 Mar 20 [cited 2014 May 20]. Report No.: 3303.0. Available from: [http://www.ausstats.abs.gov.au/ausstats/subscriber.nsf/0/E39670183DE1B0D9CA2579C6000F7A4E/\\$File/33030_2010.pdf](http://www.ausstats.abs.gov.au/ausstats/subscriber.nsf/0/E39670183DE1B0D9CA2579C6000F7A4E/$File/33030_2010.pdf).
12. ↑ Australian Institute of Health and Welfare and Cancer Australia. *General practice consultations, hospitalisation and mortality*. Canberra: AIHW; 2008 Jan 1 [cited 2014 May 20]. Report No.: 43. Cat. No. 39. Available from: <http://www.aihw.gov.au/WorkArea/DownloadAsset.aspx?id=6442454591>.
13. ↑ World Health Organization, World Meteorological Organization, United Nations Environment Programme, International Commission on Non-Ionizing Radiation Protection. *Global solar UV index: a practical guide*. Geneva, Switzerland: WHO; 2002 [cited 2014 May 20] Available from: http://www.unep.org/pdf/Solar_Index_Guide.pdf.
14. ↑ Fritschi L. *Occupational cancer in Australia*. Canberra: Australian Safety and Compensation Council, Commonwealth of Australia; 2005 [cited 2014 May 20] Available from: http://www.safeworkaustralia.gov.au/sites/swa/about/Publications/Documents/411/Occupational_Cancer_Australia_April_2006.pdf.
15. ↑ Cancer Council Australia Occupational and Environmental Cancer Committee. *Occupational cancers: the link between occupation and cancer*. [homepage on the internet] Sydney: Cancer Council Australia; 2011 Feb 1 [cited 2014 May 20; updated 2014 Mar 19]. Available from: http://wiki.cancer.org.au/prevention/Occupational_cancers/Link_between_occupation_and_cancer.
16. ↑ Commonwealth Scientific and Industrial Research Organisation. *Understanding nanosafety*. [homepage on the internet] Sydney: CSIRO; 2011 Jun 9 [cited 2014 May 20; updated 2013 Dec 24]. Available from: <http://www.csiro.au/Organisation-Structure/Divisions/CMSE/Surfaces-and-Nanosciences/Understanding-nanosafety.aspx>.
17. ↑ Stanley M, Lowy DR, Frazer I. *Chapter 12: Prophylactic HPV vaccines: underlying mechanisms*. Vaccine 2006 Aug 31;24 Suppl 3:S3/106-13 Abstract available at <http://www.ncbi.nlm.nih.gov/pubmed/16949996>.
18. ↑ Bialek SR, Bower WA, Novak R, Helgenberger L, Auerbach SB, Williams IT, et al. *Persistence of protection against hepatitis B virus infection among adolescents vaccinated with recombinant hepatitis B vaccine beginning at birth: a 15-year follow-up study*. *Pediatr Infect Dis J* 2008 Oct 1;27(10):881-5 Abstract available at <http://www.ncbi.nlm.nih.gov/pubmed/18756185>.
19. ↑ Australian Institute of Health and Welfare. *Cervical Screening in Australia 2010-2011*. Canberra: AIHW; 2013 Jan 1 [cited 2014 May 20]. Report No.: Cancer series 76. Cat. no. CAN 72. Available from: <http://www.aihw.gov.au/WorkArea/DownloadAsset.aspx?id=60129543399>.
20. ↑ Roder DM, Olver IN. *Do the benefits of screening mammography outweigh the harms of overdiagnosis and unnecessary treatment?--yes*. *Med J Aust* 2012 Jan 16;196(1):16 Abstract available at <http://www.ncbi.nlm.nih.gov/pubmed/22256917>.

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21. ↑ Olver IN, Grogan PB. *Early success for Australia's bowel screening program: let's move it along*. Med J Aust 2013 Apr 1;198(6):300-1 Abstract available at <http://www.ncbi.nlm.nih.gov/pubmed/23545018>.
 22. ↑ Cancer Council Australia Public Health Committee. *Prostate cancer: overview*. [homepage on the internet] Sydney: Cancer Council Australia; 2012 Aug [cited 2014 May 20; updated 2013 May 27]. Available from: http://wiki.cancer.org.au/prevention/Prostate_cancer/Overview.
 23. ↑ Cancer Council Australia. *Testicular cancer*. [homepage on the internet] Sydney: Cancer Council Australia; 2014 Mar 4 [cited 2014 May 20; updated 2014 Mar 4]. Available from: <http://www.cancer.org.au/about-cancer/types-of-cancer/testicular-cancer.html>.