

# House of Representatives inquiry into skin cancer in Australia

## Submission from Cancer Council Australia, Clinical Oncology Society of Australia

March 2014

Cancer Council Australia is Australia's peak national non-government cancer control organisation. Its members are the eight state and territory cancer council organisations, working together to undertake and fund cancer research, prevent and control cancer and provide information and support for people affected by cancer.



The Clinical Oncology Society of Australia (COSA) is the peak national body representing health professionals from all disciplines whose work involves the care of cancer patients.



**Responsibility for content:** Professor Ian Olver, CEO, Cancer Council Australia; Associate Professor Sandro Porceddu, President, COSA.



### **Recommendations**

Cancer Council Australia and the Clinical Oncology Society of Australia recommend that the Australian Government:

- conduct an ongoing national mass media social marketing campaign to raise awareness of skin cancer risk and sun protection;
- work with states and territories to ensure appropriate sun protection policies are supported in workplaces, schools and the wider community;
- support measures to improve skin cancer prevention and early detection in primary care.

### **Overview**

Cancer Council Australia and the Clinical Oncology Society of Australia welcome the House Standing Committee on Health's inquiry into skin cancer in Australia.

More than 750,000 Australians are treated for skin cancer each year – over 2,000 people each day.<sup>1</sup> At least two in three Australians will be diagnosed with skin cancer before the age of 70.<sup>2</sup> Every year, more than 1500 Australians deaths are caused by melanoma, and a further 500 die from non-melanoma skin cancers (NMSC).<sup>3</sup>

NMSC is the most common and second most expensive cancer in Australia, and places a high burden on the population, healthcare system and government.<sup>4,5</sup> Australia has the highest incidence of NMSC in the world.<sup>6</sup>

In 2015, the number of treatments for NMSC in Australia is projected to increase to almost 1 million (circa 939,000, up from 767,000 treatments in 2010).<sup>7</sup> The total cost of diagnosis pathologic assessment, investigations and treatment for NMSC in Australia is expected to

reach \$703 million in 2015, including \$110 million in Medicare treatments.<sup>8</sup> This represents an increase of 22% from the 2010 cost of \$511 million.<sup>9</sup> These figures do not include out-of-pocket costs to patients. There is no national dataset on the costs associated with treating melanoma in Australia. However, in 2012 Melanoma was responsible for the seventh highest burden of disease of all cancers (22,800 disability-adjusted life-years).<sup>10</sup>

Prevention and early detection are critical to improved patient and community outcomes. Missed or late diagnoses of skin cancers cause significant morbidity, commonly resulting in advanced tumours particularly of the head and neck region. Patients often require major surgery (sometimes involving removal of the nose or an eye), flap reconstructive surgery and six weeks of post-operative radiotherapy.

We address the terms of reference as follows. Note that points 3 & 4 are the most critical in respect of the evidence and the remit of the Australian Government in reducing Australia's unsustainable skin cancer burden.

## ***1. Options to improve implementation of evidence-based best practice treatment and management***

### ***Ongoing education of GPs in skin cancer prevention, early detection and treatment***

There is scope for continuous improvement in the detection and management of skin cancer by GPs. It is important to ensure that GP knowledge and skills keep pace with scientific developments in the detection and treatment of skin cancer. There is evidence that sun protection advice given by GP during a doctor's consultation can lead to improvement in sun protection behaviours.<sup>11</sup> Further, as SunSmart messages advise the population to seek GP advice about any suspicious spot or lesion, it is critical that GPs are supported in responding to these inquiries.

#### ***Support for GPs***

To date, interventions to improve implementation of clinical practice guidelines to GPs have shown limited and variable effectiveness.<sup>12</sup> Cancer Council Australia plans to integrate educational modules into online clinical practice guidelines we develop to support implementation and uptake, and reinforce content knowledge among clinicians. Qstream, a clinically proven online education method, will be used. (Qstream courses have been shown to increase both knowledge and retention of guideline content.<sup>13</sup>) Cancer Council will also explore further integration of other educational modules.

#### ***Dissemination of clinical practice guidelines***

Clinical practice guidelines aim to enhance the quality of care by promoting consistent clinical decision-making based on the best evidence. Traditional printed guidelines cannot be updated as new evidence is published; written guidelines also have other inherent cost and dissemination limitations.<sup>14</sup>

Development of online guidelines on a Wikimedia platform allows for content to be electronically searched by users, instantly updated by guideline developers as new evidence becomes available, widely disseminated among users online, and provided in a format in which stakeholders can comment or submit new evidence to developers at any time.<sup>15</sup>

While in-principle acceptance of online clinical practice guidelines is high, due to the clear benefits,<sup>16</sup> only a small proportion of physicians regularly access them.<sup>17</sup> Cancer Council will

continue to promote the benefits of online guidelines to the clinical community through all available mechanisms, including dissemination strategies for new guidelines.

Paper-based clinical practice guidelines for melanoma and NMSC were published separately in 2008 and have not been updated since.<sup>18,19</sup> Both sets of guidelines require updating; Cancer Council Australia is in the planning stages of the review of melanoma guidelines and will transition these to the interactive, Wikimedia platform.

### ***Efudex debate***

There has been recent discussion in the medical media and in the roundtable that preceded this inquiry on the Pharmaceutical Benefits Scheme listing of the topical cream Efudex for treating solar keratoses.<sup>20</sup> Solar keratoses are precancerous skin lesions which may progress to squamous cell carcinoma, a type of NMSC.<sup>21</sup>

Under current arrangements the decision to subsidise Efudex on the PBS is a matter for the Australian Government, as advised by the Pharmaceutical Benefits Advisory Committee. An application to list Efudex was submitted and rejected in 2012.

While research on the cost-effectiveness of Efudex (in comparison with treatments such as cryotherapy) continues, improved GP support (see points 1 and 2) could assist in minimising the costs of treating solar keratoses for both patients and taxpayers. For example, GPs who treat significant numbers of keratoses could be better supported in deciding when multiple keratoses should be treated with a topical preparation like Efudex or with multiple single ablative procedures.

## ***2. Strategies to enhance early diagnosis***

### ***Screening for skin cancer***

In 2011 there were 1544 Australian deaths from melanoma (1071 men, 473 women) and 543 deaths from NMSC (355 men and 188 females).<sup>22</sup> NMSC is far less likely to be life-threatening than melanoma, with around 400 times the number of cases but only a third the number of deaths.<sup>23</sup>

Survival from melanoma is strongly associated with depth of invasion; deeper and thicker melanomas are more likely to have metastasised and be more difficult to treat. In Australia, five-year survival for melanomas thicker than 4 mm is 55%, compared with almost 100% survival for melanomas 1 mm or less.<sup>24</sup> Earlier diagnosis – i.e. the detection of thinner tumours – is therefore correlated to successful patient outcomes and longer-term survival.<sup>25</sup>

Screening for melanoma does not, however, meet the World Health Organisation criteria<sup>26</sup> for the implementation of population-based screening. Screening describes the testing of a population (e.g. identified by age group) for a disease or pre-existing condition for which it shows no symptoms.<sup>27</sup> There is insufficient evidence that screening for melanoma reduces mortality; current diagnostic practices for melanoma are not appropriate for screening.<sup>28</sup>

(Screening is unlikely to ever be recommended for NMSC, as long-term illness and death are rare occurrences in relation to incidence. Surveillance – which is different from screening as it applies to symptomatic individuals, not population cohorts – is required for immunosuppressed patients who are at increased risk of skin cancer death.)

In the absence of sufficient evidence for an associated reduction in skin cancer mortality, Cancer Council Australia does not recommend population-based screening by a doctor for

skin cancer. However, high-risk individuals are likely to benefit from regular skin examinations.

### ***Education of GPs on best practice for treating solar keratoses***

Solar keratoses are precancerous skin lesions which may progress to squamous cell carcinoma, a type of NMSC.<sup>29</sup> Early detection and treatment of solar keratoses by GPs before their development into NMSC is an effective and cost-effective measure. Cryotherapy of solar keratoses through Medicare are included in normal consultation fees, unless more than ten lesions are treated, incurring a \$40 Medicare fee per treatment. As such, there is little information on the extent of GP consultations for cryotherapy treatment of solar keratoses.

Alternatively, treatment of NMSC by liquid nitrogen therapy through Medicare is associated with a cost of \$48 per treatment. This increases to \$126 where the neoplasm extends into cartilage, and up to \$170 if there are ten or more lesions.<sup>30</sup> The annual Medicare costs associated with the treatment of NMSC is estimated to reach \$110 million in 2015.<sup>31</sup>

Solar keratoses can be treated with topical 5-fluorouracil (marketed in Australia as Efudex – see point 1).<sup>32</sup>

### ***3. Effective strategies for prevention; and 4. The need to increase levels of awareness in the community and among healthcare professionals***

Skin cancer is the most preventable common cancer, with almost all cases caused by exposure to UV radiation. Increasing community awareness of skin cancer prevention is therefore a cornerstone of effective strategies for prevention. On this basis, we address terms of reference 3 and 4 as follows.

In doing so, it should also be noted that some elements of prevention, and not awareness, can be addressed through the provision of appropriate infrastructure and other support. This includes shade in design criteria for schools, and formal policies on sun protection strategies in schools and workplaces.

### ***Skin cancer prevention in occupational settings***

UV radiation is a class 1 carcinogen (known cause of cancer), so greater priority should be given to overexposure to UV radiation as an occupational health and safety issue. This should include a dedicated code of practice and underpinning legislation mandating specified sun protection measures. Evidence shows workplaces “with a written sun protection policy were more likely to have higher levels of awareness and compliance with sun protection measures. Research suggests that sun protection policies should be mandatory and monitored for compliance in order to be effective in reducing rates of skin cancer among outdoor workers”.<sup>33</sup> A total of 1360 workers compensation claims for sun-related injury or disease were made in Australia between 2000 and 2009 at a cost of \$38.4 million paid in compensation.<sup>34</sup>

### ***Skin cancer prevention in schools***

A recent review found that “schools have more comprehensive sun protection practices in the presence of a comprehensive written policy. Furthermore results demonstrate that SunSmart membership is associated with more comprehensive written policies, which in turn

is associated with more comprehensive practices”.<sup>35</sup> Another study has shown that students use, rather than avoid, newly shaded areas provided by purpose built shade sails at secondary schools.<sup>36</sup> This suggests shade structures are a practical means of reducing adolescents’ exposure to ultraviolet radiation and an important consideration in design planning of schools sites.<sup>37</sup>

### ***Sunscreen availability***

Sunscreen is effective in reducing skin cancer<sup>38</sup> therefore greater incentives (such as reducing price and increasing availability) may result in greater uptake by the general public.

### ***Federal priority 1: conduct a national skin cancer awareness campaign***

Comprehensive research shows increased public awareness of skin cancer is a highly cost-effective measure for reducing skin cancer incidence and mortality. Integrated awareness campaigns employing a mix of strategies are most likely to be effective in improving sun-protective behaviour on a population level.<sup>39,40</sup> As well as reducing numbers of diagnoses, effective public health campaigns are associated earlier detection of (thinner) melanomas, which result in increased patient survival and reduced health system expenditure.<sup>41</sup>

Skin cancer prevention is substantially more cost-effective than treatment. To treat one melanoma patient to extend their life by an average of 3.5 months costs \$47,000. The same sum invested in a comprehensive awareness campaign could reach 134,286 people.<sup>42</sup>

Funding a mass media skin cancer awareness and prevention campaign has been shown to be one of the most cost-effective public health investments available to government. The 2010 Assessing Cost-Effectiveness of Prevention (ACE-Prevention) report identified an intensive SunSmart health promotion campaign as one of only five cost-effective interventions to have a large impact on Australia’s health at less than \$50,000 per disability-adjusted life-year (DALY) and over 100,000 DALYs prevented.<sup>43</sup> The report recommended increased funding for SunSmart programs, accompanied by rigorous evaluation to strengthen the evidence base for its effectiveness.<sup>44</sup>

A comprehensive cost-benefit analysis conducted in 2008 shows that government investment in a SunSmart campaign of \$0.28 per capita returns \$2.30 for every dollar invested. (Note this is based on 2003 figures and would equate to \$0.35 per capita in 2013.) The analysis, based on Victoria’s SunSmart program found that the program achieved health gains and saved money (a “dominant” program). More than \$270 million would be saved by an optimal SunSmart program over the next 20 years, with net cost savings (intervention cost – cost offsets) of \$180 million.<sup>45</sup> Investment at this level would prevent 190,000 skin cancer cases over a 20 year period.<sup>46</sup>

In 2006–07 the Australian Government invested \$6 million in the first national mass media campaign for raising skin cancer awareness. The campaign ran over the subsequent two summers, comprising television, print and radio advertisements aimed at educating young Australians about the importance of protecting themselves from the sun.<sup>47</sup> In 2009-10 the campaign was stripped back with the removal of the free-to-air television component; funding ceased thereafter. It did, however, build on the success of the mass media campaign, with independent analysis indicating it had raised awareness and encouraged sun protection behaviour.<sup>48</sup>

In addition to skin cancer prevention, awareness campaigns are important in promoting early detection. Evidence from existing prevention campaigns indicates that prevention focused messages can also convey an early detection interpretation and response. Campaigns that



focus specifically on audiences for which early detection is a greater priority – e.g. middle and older aged men – have the potential to prompt early presentation and reduced morbidity, mortality and costs.

(The cost-benefit of fewer keratoses through improved awareness should also be considered. The treatment of solar keratoses imposes a significant and growing public cost burden. Currently, there is no data on overall expenditure, as the treatment of nine or fewer keratoses in most cases is accounted for as a standard GP consultation. There is, however, a Medicare item number for the treatment of 10 or more keratoses. Individual Medicare-funded consultations to treat 10 or more lesions totalled 9.7 million between 1994 and 2013. Solar keratosis is a direct result of UV exposure, and can be a precursor to squamous cell carcinoma.<sup>49)</sup>

There is a need for renewed federal leadership in skin cancer prevention, building on the success of the national campaign initially funded in the 2005-06 *Strengthening Cancer Care* package.

Currently, skin cancer prevention is primarily funded by State Governments. While some states have provided significant funding for prevention, in other states funding has been intermittent and insufficient. Currently there is no commitment to fund a national campaign, despite the body of evidence that points to its effectiveness and cost-effectiveness.<sup>50,51,52,53</sup> Cancer Council estimates that an effective national mass media social marketing campaign requires an investment of \$8 million per annum; \$32 million over a four-year federal budget cycle.

**Cancer Council Australia and COSA recommend that the Australian Government conduct an ongoing national mass media social marketing campaign to raise awareness of skin cancer risk and sun protection.**

---

## References

- <sup>1</sup> Fransen M, Karahalios A, Sharma N, English DR, Giles GG, Sinclair RD. Non-melanoma skin cancer in Australia. *Med J Aust.* 2012 Nov 19;197(10):565-8.
- <sup>2</sup> Staples MP, Elwood M, Burton RC, Williams JL, Marks R, Giles GG. Non-melanoma skin cancer in Australia: the 2002 national survey and trends since 1985. *Medical Journal of Australia* 2006; 184(1): 6-10.
- <sup>3</sup> Australian Institute of Health and Welfare 2014. Australian Cancer Incidence and Mortality (ACIM) books. Canberra: AIHW. <http://www.aihw.gov.au/acim-books/>.
- <sup>4</sup> Australian Institute of Health and Welfare 2013. Health system expenditure on cancer and other neoplasms in Australia: 2008–09. Cancer series no. 81. Cat. no. 78. Canberra: AIHW. <http://www.aihw.gov.au/publication-detail/?id=60129545611>.
- <sup>5</sup> Australian Institute of Health and Welfare, Cancer Australia. Non-melanoma skin cancer: general practice consultations, hospitalisation and mortality. AIHW Cat. No. 39; Cancer Series No. 43. Canberra: AIHW, 2008. <http://www.aihw.gov.au/WorkArea/DownloadAsset.aspx?id=6442454591>.
- <sup>6</sup> Staples MP, Elwood M, Burton RC, et al. Nonmelanoma skin cancer in Australia: the 2002 national survey and trends since 1985. *Med J Aust* 2006; 184: 6-10.
- <sup>7</sup> Fransen M, Karahalios A, Sharma N, English DR, Giles GG, Sinclair RD. Non-melanoma skin cancer in Australia. *Med J Aust.* 2012 Nov 19;197(10):565-8.
- <sup>8</sup> Fransen M, Karahalios A, Sharma N, English DR, Giles GG, Sinclair RD. Non-melanoma skin cancer in Australia. *Med J Aust.* 2012 Nov 19;197(10):565-8.
- <sup>9</sup> Fransen M, Karahalios A, Sharma N, English DR, Giles GG, Sinclair RD. Non-melanoma skin cancer in Australia. *Med J Aust.* 2012 Nov 19;197(10):565-8.
- <sup>10</sup> Australian Institute of Health and Welfare & Australasian Association of Cancer Registries 2012. Cancer in Australia: an overview, 2012. Cancer series no. 74. Cat. no. CAN 70. Canberra: AIHW.

- <sup>11</sup> Falk M, Magnusson H. Sun protection advice mediated by the general practitioner: an effective way to achieve long-term change of behaviour and attitudes related to sun exposure? *Scand J Prim Health Care*. 2011 Sep;29(3):135-43.
- <sup>12</sup> Wensing M, van der Weijden T, Grol R. Implementing guidelines and innovations in general practice: which interventions are effective? *Br J Gen Pract*. 1998 Feb;48(427):991-7.
- <sup>13</sup> Kerfoot BP, Kearney MC, Connelly D, Ritchey ML. Interactive spaced education to assess and improve knowledge of clinical practice guidelines: a randomized controlled trial. *Ann Surg* 2009; 249: 744-749.
- <sup>14</sup> Olver IN, Von Dincklage JJ. It is time for clinical guidelines to enter the digital age. *Med J Aust*. 2013 Nov 4;199(9):569-70.
- <sup>15</sup> Olver IN, Von Dincklage JJ. It is time for clinical guidelines to enter the digital age. *Med J Aust*. 2013 Nov 4;199(9):569-70.
- <sup>16</sup> Jeannot JG, Scherer F, Pittet V, Burnand B, Vader JP. Use of the World Wide Web to implement clinical practice guidelines: a feasibility study. *J Med Internet Res*. 2003 Apr-Jun;5(2):e12.
- <sup>17</sup> Jeannot JG, Scherer F, Pittet V, Burnand B, Vader JP. Use of the World Wide Web to implement clinical practice guidelines: a feasibility study. *J Med Internet Res*. 2003 Apr-Jun;5(2):e12.
- <sup>18</sup> Basal cell carcinoma, squamous cell carcinoma (and related lesions) - a guide to clinical management in Australia. Cancer Council Australia and Australian Cancer Network, Sydney. 2008. [http://www.cancer.org.au/content/pdf/HealthProfessionals/ClinicalGuidelines/Basal\\_cell\\_carcinoma\\_Squamous\\_cell\\_carcinoma\\_Guide\\_Nov\\_2008-Final\\_with\\_Corrigendums.pdf](http://www.cancer.org.au/content/pdf/HealthProfessionals/ClinicalGuidelines/Basal_cell_carcinoma_Squamous_cell_carcinoma_Guide_Nov_2008-Final_with_Corrigendums.pdf)
- <sup>19</sup> Australian Cancer Network Melanoma Guidelines Revision Working Party. Clinical Practice Guidelines for the Management of Melanoma in Australia and New Zealand. Cancer Council Australia and Australian Cancer Network, Sydney and New Zealand Guidelines Group, Wellington. 2008. <http://www.nhmrc.gov.au/guidelines/publications/cp111>
- <sup>20</sup> Commonwealth of Australia, Parliamentary Library, House of Representatives Standing Committee on Health and Ageing, transcript of roundtable on skin cancer in Australia, 21 June 2013.
- <sup>21</sup> Kocsard E. Solar keratoses and their relationship to non-melanoma skin cancers. *Australas J Dermatol*. 1997 Jun;38 Suppl 1:S30.
- <sup>22</sup> Australian Institute of Health and Welfare 2014. Australian Cancer Incidence and Mortality (ACIM) books. Canberra: AIHW. <http://www.aihw.gov.au/acim-books/>.
- <sup>23</sup> Australian Institute of Health and Welfare 2014. Australian Cancer Incidence and Mortality (ACIM) books. Canberra: AIHW. <http://www.aihw.gov.au/acim-books/>.
- <sup>24</sup> Australian Institute of Health and Welfare 2012. Cancer survival and prevalence in Australia: period estimates from 1982 to 2010. Cancer Series no. 69. Cat. no. CAN 65. Canberra: AIHW.
- <sup>25</sup> Balch CM, Soong SJ, Atkins MB, Buzaid AC, Cascinelli N, Coit DG, et al. An evidence-based staging system for cutaneous melanoma *CA Cancer J Clin* 2004.
- <sup>26</sup> Wilson JMG, Jungner G. Principles and practices of screening for disease. Geneva, Switzerland: World Health Organization; 1968. Report No.: Public Health Papers No. 34.
- <sup>27</sup> Wilson JMG, Jungner G. Principles and practices of screening for disease. Geneva, Switzerland: World Health Organization; 1968. Report No.: Public Health Papers No. 34.
- <sup>28</sup> Australian Cancer Network Melanoma Guidelines Revision Working Party. Clinical Practice Guidelines for the Management of Melanoma in Australia and New Zealand. Cancer Council Australia and Australian Cancer Network, Sydney and New Zealand Guidelines Group, Wellington. 2008. <http://www.nhmrc.gov.au/guidelines/publications/cp111>
- <sup>29</sup> Kocsard E. Solar keratoses and their relationship to non-melanoma skin cancers. *Australas J Dermatol*. 1997 Jun;38 Suppl 1:S30.
- <sup>30</sup> Medicare Australia. Medicare benefits schedule (webpage). Commonwealth Department of Health, Canberra. Accessed Feb 10, 2014. Available from: <http://www.health.gov.au/internet/mbsonline/publishing.nsf/Content/Medicare-Benefits-Schedule-MBS-1>

- 
- <sup>31</sup> Fransen M, Karahalios A, Sharma N, English DR, Giles GG, Sinclair RD. Non-melanoma skin cancer in Australia. *Med J Aust*. 2012 Nov 19;197(10):565-8.
- <sup>32</sup> Kocsard E. Solar keratoses and their relationship to non-melanoma skin cancers. *Australas J Dermatol*. 1997 Jun;38 Suppl 1:S30.
- <sup>33</sup> Woolley T, Buettner PG, Lowe JB. Predictors of sun protection in northern Australian men with a history of non-melanoma skin cancer. *Preventative Medicine*, 2004. 39(2): p. 300-307
- <sup>34</sup> Available from: <https://www.cancerwa.asn.au/resources/2011-12-05-ccupational-exposure-to-ultraviolet-radiation.pdf>
- <sup>35</sup> Dono J, Ettridge KA, Sharplin GR, Wilson CJ. The relationship between sun protection policies and practices in schools with primary-age students: the role of school demographics, policy comprehensiveness and SunSmart membership. *Health Educ Res*. 2014 Feb;29(1):1-12.
- <sup>36</sup> Dobbins SJ, White V, Wakefield MA, Jansen KM, White V, Livingston PM, English DR, Simpson JA. Adolescents' use of purpose built shade in secondary schools: cluster randomised controlled trial. *BMJ*. 2009 Feb 17;338:b95.
- <sup>37</sup> Dobbins SJ, White V, Wakefield MA, Jansen KM, White V, Livingston PM, English DR, Simpson JA. Adolescents' use of purpose built shade in secondary schools: cluster randomised controlled trial. *BMJ*. 2009 Feb 17;338:b95.
- <sup>38</sup> Green AC, Williams GM, Logan V, Strutton GM. Reduced melanoma after regular sunscreen use: randomized trial follow-up. *J Clin Oncol*. 2011 Jan 20;29(3):257-63.
- <sup>39</sup> Guide to Community Preventive Services. 2012. Preventing skin cancer: multicomponent community-wide interventions. Available from [www.thecommunityguide.org/cancer/skin/community-wide/multicomponent.html](http://www.thecommunityguide.org/cancer/skin/community-wide/multicomponent.html).
- <sup>40</sup> Dobbins SJ, Wakefield MA, Jansen KM, Herd NL, Spittal MJ, Lipscomb JE, Hill DJ. Weekend sun protection and sunburn in Australia trends (1987-2002) and association with SunSmart television advertising. *Am J Prev Med*. 2008 Feb;34(2):94-101.
- <sup>41</sup> Armstrong A, Powell C, Powell R, Hallam N, Taylor J, Bird J, Sarran C, Oliver D. Are we seeing the effects of public awareness campaigns? A 10-year analysis of Breslow thickness at presentation of malignant melanoma in the South West of England. *J Plast Reconstr Aesthet Surg*. 2013 Dec 31.
- <sup>42</sup> Gordon L. Costs of skin cancer and cost-effectiveness of prevention and screening: a review. 2nd International Conference on UV and Skin Cancer Prevention Berlin, Germany. 10-13 September 2013.
- <sup>43</sup> Vos T, Carter R, Barendregt J, Mihalopoulos C, Veerman L, Magnus A, Cobiac L, Bertram M, Wallace AL, ACE-Prevention Team. Assessing cost-effectiveness in prevention (ACE-Prevention): Final report. University of Queensland & Deakin University: Brisbane & Melbourne 2010.
- <sup>44</sup> Vos T, Carter R, Barendregt J, Mihalopoulos C, Veerman L, Magnus A, Cobiac L, Bertram M, Wallace AL, ACE-Prevention Team. Assessing cost-effectiveness in prevention (ACE-Prevention): Final report. University of Queensland & Deakin University: Brisbane & Melbourne 2010.
- <sup>45</sup> Shih ST, Carter R, Sinclair C, Mihalopoulos C, Vos T. Economic evaluation of skin cancer prevention in Australia. *Prev Med*. 2009 Nov;49(5):449-53.
- <sup>46</sup> Shih ST, Carter R, Sinclair C, Mihalopoulos C, Vos T. Economic evaluation of skin cancer prevention in Australia. *Prev Med*. 2009 Nov;49(5):449-53.
- <sup>47</sup> Department of Health and Ageing. National Skin Cancer Awareness Campaign Media Release. Canberra: Commonwealth of Australia; 2009 Nov 16 Available from: <http://www.health.gov.au/internet/ministers/publishing.nsf/Content/mr-yr09-nr-nr209.htm>.
- <sup>48</sup> Dobbins S, Wakefield M, Hill D, Girgis A, Aitken JF, Beckmann K, et al. Prevalence and determinants of Australian adolescents' and adults' weekend sun protection and sunburn, summer 2003-2004 *J Am Acad Dermatol* 2008 Oct;59(4):602-14.
- <sup>49</sup> Kocsard E. Solar keratoses and their relationship to non-melanoma skin cancers. *Australas J Dermatol*. 1997 Jun;38 Suppl 1:S30.
- <sup>50</sup> Shih ST, Carter R, Sinclair C, Mihalopoulos C, Vos T. Economic evaluation of skin cancer prevention in Australia. *Prev Med*. 2009 Nov;49(5):449-53.



---

<sup>51</sup> Dobbins S, Wakefield M, Hill D, Girgis A, Aitken JF, Beckmann K, et al. Prevalence and determinants of Australian adolescents' and adults' weekend sun protection and sunburn, summer 2003-2004 J Am Acad Dermatol 2008 Oct;59(4):602-14.

<sup>52</sup> Dobbins SJ, Wakefield MA, Jansen KM, Herd NL, Spittal MJ, Lipscomb JE, Hill DJ. Weekend sun protection and sunburn in Australia trends (1987-2002) and association with SunSmart television advertising. Am J Prev Med. 2008 Feb;34(2):94-101.

<sup>53</sup> Vos T, Carter R, Barendregt J, Mihalopoulos C, Veerman L, Magnus A, Cobiac L, Bertram M, Wallace AL, ACE-Prevention Team. Assessing cost-effectiveness in prevention (ACE-Prevention): Final report. University of Queensland & Deakin University: Brisbane & Melbourne 2010.