NATIONAL INSTITUTE FOR HEALTH AND CLINICAL EXCELLENCE

PUBLIC HEALTH DRAFT GUIDANCE

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Skin cancer: how the NHS and local authorities can help prevent skin cancer using public information, sun protection resources and by making changes to the environment

NICE public health guidance X

Introduction

The Department of Health (DH) asked the National Institute for Health and Clinical Excellence (NICE) to produce public health guidance for the NHS and local authorities on the prevention of skin cancer with specific reference to: provision of information, physical changes to the environment and the supply of sun protection resources.

The guidance is for NHS and other commissioners, managers and practitioners who have a direct or indirect role in, and responsibility for, skin cancer. This includes, for example, local authority planners, public health practitioners, pharmacists, GPs, school nurses, practice nurses and skin cancer specialists (such as clinical nurse specialists [skin cancer], dermatologists and skin cancer surgeons). It may also be of interest those working in the wider public, private, voluntary and community sectors and to members of the public.

The guidance complements, but does not replace, NICE guidance on detecting and treating skin cancer. (For further details, see section 7.)

The Public Health Interventions Advisory Committee (PHIAC) has considered the evidence reviews, economic modelling and expert papers.

This document sets out the Committee's preliminary recommendations. It does not include all sections that will appear in the final guidance. NICE is now inviting comments from stakeholders (listed on our website at www.nice.org.uk).

Note that this document does not constitute NICE's formal guidance on information, resources and environmental changes to prevent skin cancer. The recommendations made in section 1 are provisional and may change after consultation with stakeholders.

The stages NICE will follow after consultation are summarised below.

- The Committee will meet again to consider the comments that have been submitted.
- After that meeting, the Committee will produce a second draft of the guidance.

The draft guidance will be signed off by the NICE Guidance Executive. For further details, see 'The NICE public health guidance development process: An overview for stakeholders including public health practitioners, policy makers and the public (second edition, 2009)' available from www.nice.org.uk/phprocess

The key dates are:

Closing date for comments: 16 September 2010
Second Committee meeting: 8 October 2010.

Members of PHIAC are listed in appendix A and supporting documents used to prepare this document are listed in appendix E.

This guidance was developed using the NICE public health intervention process.

Contents

1 Recommendations

Introduction

When writing the recommendations, the Public Health Interventions Advisory Committee (PHIAC) (see appendix A) considered the evidence reviews, expert papers and economic analysis. Note: this document does not constitute NICE's formal guidance on this intervention. The recommendations are preliminary and may change after consultation.

PHIAC considers that the recommended measures are cost effective.

The evidence statements underpinning the recommendations are listed in appendix C.

The evidence reviews, supporting evidence statements, expert papers and economic analysis reports are available at www.nice.org.uk/guidance/

What the guidance covers

Recommendations 1 and 2 cover national and local information provision to raise awareness and increase knowledge of skin cancer-related risk factors as a prerequisite to changing attitudes and behaviour towards sun exposure.

Recommendation 3 covers a range of factors that should be considered when planning and creating messages.

Recommendation 4 focuses on the content of national and local information provision.

Recommendation 5 focuses on protecting children, young people and outdoor workers by developing workplace policies on skin cancer prevention to help re-enforce recommendations 1 and 2.

Recommendation 6 covers structures to provide shade as part of the initial design of new buildings.

This guidance does not exclude any particular group from the 'Whose health will benefit' section. However, specific population groups are more likely to benefit. This includes, for example, outdoor workers and those who are immuno-suppressed who are at a higher risk of developing skin cancer and groups, such as children, who are more vulnerable to sun exposure.

What the guidance does not cover

There are no specific recommendations on multi-component interventions combining provision of information and resources (such as hats, protective clothing or sunscreen) as none of those identified were cost effective. Similarly, there are no recommendations on the provision of resources alone – as no evidence was identified in this area.

The assessment of fiscal or legislative policy related to sunbed interventions (such as raising the minimum age of use or banning unsupervised or coin-operated sunbed facilities) was not within the scope of this guidance.

Whose health will benefit?

Everybody but, in particular, at-risk and vulnerable groups. This includes, for example, outdoor workers, children and young people and those who use sunbeds.

Recommendation 1 Information provision: national mass-media campaigns

Who should take action?

- Commissioners, organisers and planners of national mass-media skin cancer campaigns.

What action should they take?

- Continue to develop and deliver national mass-media campaigns to raise awareness of the risk of skin cancer and ways of protecting against it. The campaigns should:

  - be informed by research that identifies and understands the different target groups
  - consider groups which epidemiological data indicate are at higher risk of skin cancer (such as those with fairer skin, outdoor workers, people who use sunbeds and those who are immuno-suppressed). Also consider those who are more vulnerable to sun exposure (such as children and young people).

- Ensure the campaigns convey simple, succinct messages tailored for the target groups (for example, those taking winter and summer holidays in the sun, parents or those working outdoors). (See recommendations 3 and 4 for further information about the factors to consider when devising the messages.)

- Regularly change campaign material to help maintain impact.

- Try to integrate campaign messages within existing national health promotion programmes or services (such as Sure Start or the National Healthy Schools Programme). The aim is to keep costs as low as possible.

- Pilot and evaluate the mass-media campaigns with the target audience – this includes assessing their views on the content and format of the campaign.

Recommendation 2 Information provision: local activities

Who should take action?

- Planners, organisers and providers of local health promotion activities. This includes:

  - staff in health promotion units and local authorities
  - directors of public health
  - NHS commissioners.

- GPs, health visitors, school nurses and other practitioners who provide local health promotion information.

What action should they take?

- Continue with any existing local activities which aim to raise awareness of the risks of skin cancer and sources of protection. (These may include one-to-one and group-based advice as well as local media campaigns.)

- In areas where there are no such activities, integrate skin cancer awareness and prevention messages into existing local health promotion campaigns and activities. For example, they could be integrated with activities related to the Healthy Child Programme and Sure Start.

Recommendation 3 Information provision: creating the message

Who should take action?

- Commissioners, organisers and planners of national mass-media skin cancer campaigns.

- Planners, organisers and providers of local health promotion activities. This includes:
  - staff in health promotion units and local authorities
  - directors of public health
  - NHS commissioners
- GPs, health visitors, school nurses and other practitioners who provide local health promotion information.

What action should they take?

- Use local, regional and national demographic assessments to identify which particular groups or activities need to be targeted locally. This could include profiles from public health observatories or data from joint strategic needs assessments. Possible groups who may be targeted include:

  - those with fair skin
  - children and young people
  - outdoor workers
  - those who are immuno-suppressed
  - those using sunbeds.

- Messages should detail the:
  - risk factors (such as skin type) and types of behaviour to avoid (for example, unprotected exposure to the sun or use of indoor tanning devices)
  - consequences of over-exposure.

- Messages should include a simple explanation of how the sun damages the skin and how environmental factors (such as geographical location, cloud cover, UV forecasts and the availability of shade) can affect the level of sun exposure.

- Messages should stress the need to avoid getting burnt. In addition, they should explain:
  - when and how people can protect themselves and where they can obtain further advice and information
  - how someone can assess their own risk of sun damage (for example, if they have lots of moles, it should stress the importance of checking their skin regularly for any changes).

- Messages should address the social and practical barriers to using sun protection. For example, they should acknowledge the common perception that a sun-tanned appearance is attractive and that the health risks are minimal. They should also address the problems people can experience when applying sunscreen and the perceived unattractiveness of, and any discomfort that may be caused by, having to wear protective clothing or sunscreen.

- Messages should be couched in such a way that they enhance people's belief in their ability to change – and encourage them to make those changes. For example, a positive statement or phrase such as, 'Using sunscreen with sun protection factor (SPF) 30 for adults (or SPF 50 for children) increases the chances of keeping skin healthy and young looking', is effective when trying to prevent skin cancer. Negative messages such as, 'Not using sunscreen increases the risk of skin cancer and prematurely ages the skin', are not so effective.

- Messages should be tailored to the target group and address any barriers to change that they may face. This includes:
    - common misconceptions, such as a belief that skin cancer is not a serious, life-threatening condition and that the more someone is exposed to the sun, the more protection they develop – or that incidental tanning is less dangerous than deliberate tanning
    - the perceived negative consequences of sun protection activities including reduced exposure to vitamin D and a possible reduction in physical activity levels to avoid exposure to the sun.

- Messages should take account of children's cognitive ability.

- Messages should encourage protective behaviours by appealing to carer or parental concern for their child or tapping into adult or young people's concerns relating to the ageing effects of exposure to the sun.

- Messages should be repeated over time and regularly updated to keep the audience's attention.

- Messages should be timed appropriately (for example, in the Spring and Summer) and should be reinforced each year.

- Where feasible, the format and content of the messages should be developed and piloted with the target audience.

Recommendation 4 Information provision: message content

Who should take action?

- Commissioners, organisers and planners of national mass-media skin cancer campaigns.

- Planners, organisers and providers of local health promotion activities. This includes:

  - staff in health promotion units and local authorities
  - directors of public health
  - NHS commissioners.

- GPs, health visitors, school nurses and other practitioners who provide local health promotion information.

What action should they take?

- The following detail on risk factors and population groups should be considered for inclusion in skin protection messages:
  - **Skin type** Those with skin types I and II are at greatest risk of developing skin cancer as they burn rapidly. People with this type of skin should avoid exposure to the sun and protect themselves by wearing clothing and using sunscreen and shade. People with skin types III and IV should protect themselves in strong sunshine and during prolonged exposure. Types V and VI need only protect themselves during prolonged ultra violet (UV) exposure[1].
  - **Children** Children should be protected using shade, clothing and SPF 50+ sunscreen. Babies should be kept out of direct sunlight.

[1] For skin type classification, visit www.sunsmart.org.uk/skin-cancer-facts/your-skin-type/index.htm

  - **Outdoor working** Outdoor workers need to protect their exposed skin during the summer by regularly applying high protection sunscreen (that is, every 2 hours). Water resistant products are advised if sweating or contact with water is likely. If possible, they should wear a hat that shades the face, neck and ears. They should also try to spend time in the shade during breaks, and if possible limit time in the sun in the middle of the day (11am to 3pm).
  - **Immuno-suppressed patients** People who are on immuno-suppressive drugs are at increased risk of skin cancer. Likewise, those who are HIV-positive are at higher risk. These groups need to examine their skin regularly for signs of cancer and seek advice if concerned. They should also protect themselves by using sunscreen, clothing and shade.
  - **Personal or family history of skin cancer** Those with a personal or family history of skin cancer should take extra care to protect their skin from the sun, and should regularly check for changes that may indicate skin cancer.
  - **Number of moles** People with a lot of moles (more than 50) need to check their skin monthly for any changes. They should also use clothing, shade and sunscreen to protect themselves.
  - **Indoor tanning devices** Devices such as sunbeds and sunlamps do not provide a safe alternative to sunbathing and should not be used to get a suntan.

- Messages could also include the following information about when and how to protect skin from the sun (plus details of where to get further advice and information):
  - **Avoid sunburn** Avoid excess sun exposure which causes sunburn or heavy tanning.

- **When to protect** When it's sunny spend time in the shade between 11am and 3pm. Protect the skin when it's sunny both in the UK and abroad and on winter sports holidays.
- **Clothing** Protect the skin with clothing (such as a broad-brimmed hat, long-sleeved top and, where possible, trousers) and UV radiation protective sunglasses. Where possible, choose close-weave fabrics that don't allow the sun through.
- **Sunscreen type** Choose a sunscreen labelled 'broad spectrum'. This means it offers both UVA and UVB protection. Use a 'high protection' sunscreen of at least SPF 30 for adults (and 50+ for children) to protect against UVB and with high UVA protection (as indicated in the UK by at least four stars and the circular UVA logo). Ensure the product is labelled 'photostable'. Sunscreens should not be used as an alternative to clothing and shade, rather they should offer additional protection. Note, no sunscreen product provides 100% protection against the sun.
- **Sunscreen application** Apply liberally half-an-hour before going out in the sun and half-an-hour after being in it to ensure adequate protection (don't forget your head, neck and ears). (The average adult should apply approximately 35 millilitres [mls] for a full body application.) Re-apply it at least every 2 hours, and immediately after being in water, even if the sunscreen is 'water resistant'. Also re-apply after towel drying.

Recommendation 5 Protecting children, young people and outdoor workers

Who should take action?

- Employers and managers in educational and leisure settings.

- Other employers and managers – particularly those with employees who work outdoors.

What action should they take?

- Assess if there is a risk of harm from sun exposure. Where this is the case, develop a specially tailored policy to ensure people are protected as much as possible.

- Ensure policies for educational and leisure settings aim to:
  - ensure children and young people do not get sunburnt and minimise their over-exposure to the sun
  - encourage parents to provide high factor sunscreen for their children (for the children to apply themselves)
  - provide employees with clear guidelines on how to help children and young people apply sunscreen or how best children can help each other to apply it
  - encourage children and young people to seek shade (for example, during school breaks outside, particularly in the middle of the day when sunny)
  - encourage children and young people to wear protective clothing such as hats.

- Workplace policies should encourage outdoor workers to:
  - wear protective clothing, including a broad-brimmed hat that covers the back of the neck
  - stay in the shade where possible, especially during breaks and in the middle of the day (11am to 3pm)
  - use a high factor sunscreen (SPF 30+) – including water resistant products – if work involves contact with water or is likely to make someone sweat
  - check their skin regularly for unusual moles, spots or changes to their skin or moles.

- Assess the training needs of staff responsible for policy-making who work in outdoor, educational or leisure environments. Ensure they have the necessary skills and information to give their colleagues and those at risk of skin cancer advice on sun protection issues. For example, teachers and others working in education may need training in the risk factors, the types of behaviours to avoid and how to encourage children and young people to apply their own sunscreen or to apply it to other children. Employers and managers may need training in how to carry out risk assessments in relation to exposure to the sun during the working day.

Recommendation 6 Providing shade

Who should take action?

Architects, designers, developers, employers and planners.

What action should they take?

- When designing and constructing new buildings, consider providing areas of shade created either naturally (for example, using trees) or artificially.

- When developing or redeveloping communal outdoor areas, check whether it is feasible to provide areas of shade. This could be achieved by constructing a specific structure, planting trees or using other forms of natural shade.

2 Public health need and practice

Background

There are two main types of skin cancer:

- Non-melanoma is the most common and is usually the easiest to treat. There are two main sorts: basal cell carcinoma and the more serious squamous cell carcinoma (if left untreated, squamous cell carcinoma can spread to other parts of the body and can be disfiguring).

- Malignant melanoma is the most serious and causes the majority of skin cancer deaths.

In 2002, it was estimated that the NHS spent approximately £70 million on skin cancer. (Morris et al. 2005).

A recent survey highlighted that 44% of Britons cannot recognise the key signs (for example, a mole which is getting larger or which has an irregular border or colour) (British Association of Dermatologists 2010). The majority of respondents (85%) thought that skin cancer accounted for less than 10% of all cancers in the UK (the actual figure is around 33%) (British Association of Dermatologists 2010).

Incidence

While skin cancer prevention has been a low priority in comparison with other public health activities, non-melanoma skin cancer is estimated to account for around a third of all cancers detected in the UK. More than 69,000 people were registered with this type of the cancer in 2007 (Office for National Statistics 2009a). However, due to incomplete registration, the actual number of cases may be over 100,000 (Cancer Research UK 2010a).

Research has shown that the incidence of non-melanoma is rising in the young, especially among those aged 30–39 (Bath-Hextall et al. 2007).

In England, more than 8800 cases of malignant melanoma were diagnosed in 2007 (Office for National Statistics 2009a). In 2008, it caused 1847deaths in this country (Office for National Statistics 2009b).

Since the 1970s, the incidence of malignant melanoma has more than tripled in the UK. Among males it has increased from around 2.5 per 100,000 in 1975 to 14.3 in 2006. The rate among females has increased from 3.9 to 15.4 per 100,000 during the same period (Cancer Research UK 2010b). Although incidence rates are higher among females, more men die from it (Office for National Statistics 2009b).

Risk factors

Exposure to ultraviolet (UV) radiation is the leading cause of skin cancer. This can occur naturally via sunlight and artificially through the use of sun lamps and tanning beds. A range of factors can increase the risk, including:

- Age and sex – the number of cases of malignant melanoma increases with age and is more common in women (Cancer Research UK 2010b). Skin damage (sunburn) at any age is associated with an increased risk of developing skin cancer later in life (Elwood and Jopson 1997).

- Ethnicity – although incidence rates are lower among people with darker skin (National Cancer Intelligence Network 2009), it is often diagnosed late, which can increase the risk of death (Cornier et al. 2006).

- Individual risk – skin type, number of moles, hair and eye colour, a history of lowered immunity or transplant and a family or personal history of skin cancer all affect the risk of melanoma (Cancer Research UK 2010c).

- Regional variation – London and the north have the lowest incidence, while the highest incidence is in the south-west of England (Office for National Statistics 2005).

- Socioeconomic status – malignant melanoma is associated with affluence. There is a 60–70% lower incidence among people from deprived areas compared with their more affluent peers (Cancer Research UK 2010b). However, people from more affluent areas are more likely to survive the condition (Coleman et al. 2001). In addition, it should be noted that sunbed outlets are particularly prevalent in areas of socioeconomic deprivation (Walsh et al. 2009) – and that this could affect the rate among lower socioeconomic groups in the future.

- Occupation – a range of outdoor workers and people involved in outdoor sports are particularly at risk of skin cancer. This includes farmers, construction and postal workers, gardeners, cricketers and golfers.

Prevention

The risk of developing skin cancer can be reduced by, for example, avoiding getting burnt by opting to stay in the shade during the middle of the day, wearing protective clothing and using high-SPF products.

Early detection is also important. However, in a recent UK survey, only 34% of respondents said they check their moles at least once a month and 25% never check them (British Association of Dermatologists 2010).

In a 2003 survey, 80% of those questioned mentioned using sunscreen to reduce the risk of skin cancer, but less than half (44%) specifically mentioned using a sunscreen with a 15+ SPF (Office for National Statistics 2003).

Policy background

This guidance should be viewed in light of the following policy documents:

- 'Cancer reform strategy' (DH 2007) committed the UK government to increase funding for skin cancer prevention through awareness-raising activities.

- The Local Government and Public Involvement in Health Act (Department of Communities and Local Government 2007) outlines how primary care trusts and local authorities should undertake a joint strategic needs assessment of their population's health and social care needs.

- 'The NHS cancer plan: a plan for investment, a plan for reform' (DH 2000) sets out a comprehensive national cancer programme for England. It covers prevention, screening, diagnosis, treatment and care.

3 Considerations

The Public Health Interventions Advisory Committee (PHIAC) took account of a number of factors and issues when developing the recommendations.

Evidence

3.1 The majority of studies identified in the evidence reviews were based in countries where the climate is very different to that experienced in the UK (for example, Australia and America).

3.2 Multi-component public health interventions which combine a number of strategies (such as information provision alongside resources or structural changes to the environment) are often considered to be effective and cost effective. However, the evidence on multi-component interventions to prevent skin cancer was weak. There were no UK studies and most focused on the provision of information with only a small component devoted to resources (such as hats or sunscreen samples). The majority did not assess the effect of individual components and many of those measuring behaviour change relied on self-reported measures. In addition, the economic modelling found that none of them were cost effective. This was primarily because of the small number of malignant melanoma deaths that were prevented as a result. (While the incidence of melanoma has increased in the UK from 6.3 per 100,000 in 1986 to 14.9 per 100,000 in 2007, the death rates are relatively low compared to those caused by many other cancers in the UK.) Consequently, PHIAC did not recommend any of the multi-component interventions that were assessed.

Information provision

3.3 A wide range of studies in a variety of settings found that information provision (including for example, one-to-one and group-based verbal advice) has a positive, short-term effect on people's knowledge and attitudes. A small number of studies also showed that national mass-media campaigns can help raise awareness of the risks of skin cancer. They can also have a positive impact on knowledge, attitudes, behavioural intentions and behaviour change

in the short term. Note: improving knowledge and raising awareness were felt to be an important prerequisite to attitude and behaviour change.

3.4 National mass-media campaigns and activities to provide skin cancer prevention information both need to be low cost to be cost effective. This is primarily due to the relatively low number of cases and deaths from malignant melanoma. For example, a mass-media campaign would need to achieve a 2% change in behaviour (over 5 years) and cost less than 0.5 pence per person per annum to be cost effective. An information booklet would need to cost less than £2 per person.

3.5 There is limited evidence to suggest that media images can influence young people. However, PHIAC considered that it would be a positive step if young people's role models could be used to endorse skin cancer prevention messages.

3.6 The way messages are worded – and the medium used – are important. Carers, parents and teachers and those who have experienced skin cancer could help get positive messages across.

3.7 Many of the studies involved children and young people and PHIAC was aware that it is important to consider their cognitive ability when delivering information-related interventions. The evidence suggests that, generally, children under 7 are unable to remember information they have been given previously (even when prompted). Those between the ages of 7 and 11, on the other hand, are able to do this.

Protecting children, young people and outdoor workers

3.8 PHIAC recognised the important role that employers and managers in schools, leisure facilities and other workplaces can play in

helping to raise awareness of the dangers of skin cancer. This can be achieved by developing policies which cover skin cancer issues.

3.9 PHIAC identified a number of barriers to providing sun protection which are specific to the educational sector. For example, there is a lack of clarity about who is responsible for ensuring children use sun protection cream and clothes – parents or teachers? There are also liability concerns if a child is sunburnt or has an allergic reaction to sunscreen products. Time constraints and difficulties in rescheduling outdoor activities to different times of the day – or moving them to areas of shade – were also identified as potential barriers. (Further information on the development of education, leisure or workplace-based policies can be obtained from www.sunsmart.org.uk/schools and the Health and Safety Executive.)

Providing shade

3.10 A small number of studies were identified on the effect of providing additional structures in school grounds to create shade. The studies found that these structures were used by children and that they may help reduce their UV exposure. Adding shade structures to the existing built environment was not cost effective. However, if the provision of shade was incorporated into the design and construction of buildings from the outset, then it was a cost-effective option.

Other factors

3.11 Exposure to the sun does have a number of benefits. For example, it gives people an increased sense of wellbeing, allows them to synthesise vitamin D and provides more opportunities for physical activity.

3.12 PHIAC noted that vitamin D and sun exposure is a complex and often controversial issue. It is clear that vitamin D is essential for bone health and there is ongoing research to establish other positive health benefits. The amount of vitamin D people need is also subject to debate.

3.13 Expert testimony from Cancer Research UK suggested that adequate vitamin D intakes could be achieved by going outside for a few minutes of the day without sunscreen, while avoiding sunburn.

3.14 PHIAC considered the potential adverse effects of any skin cancer prevention intervention – such as a reduction in physical activity levels as people aim to reduce their exposure to the sun. PHIAC believes this can be combated by using tailored and appropriate messages – and by ensuring that protective measures, such as the use of certain types of clothing, are not too restrictive.

3.15 PHIAC noted the deleterious effects of sunbed use and the Sunbeds (Regulation) Act 2010 which makes it illegal for tanning salons to allow under-18s to use them.

3.16 PHIAC noted that organisations in the private sector, for example, sun product manufacturers, could play an important role in helping raise awareness and providing advice on protecting the skin against sun damage.

3.17 PHIAC noted that the use of consistent terms and messages by all organisations involved in skin cancer prevention would help improve communication of the key messages.

This section will be completed in the final document.

4 Implementation

NICE guidance can help:

- NHS organisations, social care and children's services meet the requirements of the DH's revised 'Operating framework for 2010/11'.
- National and local organisations improve quality and health outcomes and reduce health inequalities.
- Local authorities fulfil their remit to promote the wellbeing of communities.
- Local NHS organisations, local authorities and other local partners benefit from any identified cost savings, disinvestment opportunities or opportunities for re-directing resources.
- Provide a focus for multi-sector partnerships for health, such as the integration of health and social care and health improvement.

NICE will develop tools to help organisations put this guidance into practice. Details will be available on our website after the guidance has been issued (www.nice.org.uk/guidance/PHxx).

5 Recommendations for research

This section will be completed in the final document.

More detail on the gaps in the evidence identified during development of this guidance is provided in appendix D.

6 Updating the recommendations

This section will be completed in the final document.

7 Related NICE guidance

Published

Skin tumours including melanoma. NICE cancer service guidance (2010). Available from www.nice.org.uk/guidance/CSGSTIM

Maternal and child nutrition. NICE public health guidance 11 (2008). Available from www.nice.org.uk/guidance/PH11

Community engagement. NICE public health guidance 9 (2008). Available from www.nice.org.uk/guidance/PH9

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Photodynamic therapy for non-melanoma skin tumours (including premalignant and primary non-metastatic skin lesions). NICE interventional procedure 155 (2006). Available from www.nice.org.uk/guidance/IPG155

Referral guidelines for suspected cancer. NICE clinical guideline 27 (2005). Available from www.nice.org.uk/guidance/CG27

Under development

Diagnosis and management of metastatic malignant disease of unknown primary origin. NICE clinical guideline (publication expected July 2010)

Melanoma (previously untreated unresectable stage III or IV) – ipilimumab in combination with dacarbazine. NICE technology appraisal (publication date to be confirmed)

Melanoma (stage III or IV) – ipilimumab. NICE technology appraisal (publication date to be confirmed)

8 References

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Office for National Statistics (2009b) Mortality statistics: cause. England and Wales 2008. London: Office for National Statistics

Walsh A, Harris S, Bowtell N et al. (2009) Sunbed outlets and area deprivation in the UK. Bristol: South West Public Health Observatory

Appendix A Membership of the Public Health Interventions Advisory Committee (PHIAC), the NICE project team and external contractors

Public Health Interventions Advisory Committee

NICE has set up a standing committee, the Public Health Interventions Advisory Committee (PHIAC), which reviews the evidence and develops recommendations on public health interventions. Membership of PHIAC is multidisciplinary, comprising public health practitioners, clinicians, local authority officers, teachers, social care professionals, representatives of the public, academics and technical experts as follows.

Professor Sue Atkinson CBE Independent Consultant and Visiting Professor, Department of Epidemiology and Public Health, University College London

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External contractors

Evidence reviews

Review 1: 'Providing public information to prevent skin cancer' was carried out by West Midlands Health Technology Assessment Collaboration (WMHTAC), University of Birmingham. The principal authors were: Kinga Malottki, Dechao Wang, Lazaros Andronis, Pelham Barton, Anne Fry-Smith, Wendy Greenheld and David Moore.

Review 2: 'Synthesis of the West Midland health technology assessment collaboration reports: providing public health information to prevent skin cancer: review of effectiveness and cost effectiveness (dated February 2009) and addendum (dated May 2009) – including before and after studies' was carried out by the University of the West England. The principal author was Lynne Eagle.

Review 3: 'Providing public information to prevent skin cancer: barriers to and facilitators to conveying information to prevent the first occurrence of skin cancer: a systematic review of qualitative literature' was carried out by Peninsula Technology Assessment Group (PenTAG), Universities of Exeter and Plymouth. The principal authors were: Ruth Garside, Mark Pearson, Tiffany Moxham and Rob Anderson.

Review 4: 'Sun protection resources and environmental changes to prevent skin cancer: a systematic review' was carried out by the Centre for Reviews and Dissemination. The principal authors were: Catriona McDaid, Fiona Paton, Kath Wright, Steve Rice, Emma Maund and Amanda Sowden.

Review 5: 'Sun protection resources and changes to the environment to prevent skin cancer: qualitative evidence review' was carried out by Matrix. The principal authors were: Theo Lorenc, Farah Jamal and Chris Cooper.

Economic analysis

Report 1: ‘Providing public health information to prevent skin cancer: modelling strategies for primary prevention of skin cancer’ was carried out by WMHTAC, University of Birmingham. The principal authors were: Pelham Barton, Lazaros Andronis, Kinga Malottki and David Moore.

Report 2: ‘Economic analysis to inform the development of NICE public health intervention guidance on information, sun protection resources and physical changes to the environment to prevent skin cancer (phase 2)’ was carried out by Matrix. The principal authors were: Kevin Marsh, Evelina Bertranou and Meena Venkatachalam.

Expert papers

Expert paper 1: ‘A summary of key messages to be included in public information resources for the primary prevention of skin cancer’ was carried out by the British Association of Dermatologists.

Expert paper 2: ‘Summary of current policy drivers and national practice overview’ was carried out by South West Public Health Observatory. The principal authors were: Nicola Bowtell and Julia Verne.

Expert paper 3: ‘National campaigns (UK and worldwide)’ was carried out by the University of the West of England and Cancer Research UK. The principal authors were: Lynne Eagle, Simon Jones, Gillian Kemp and Sara Hiom (the University of the West of England); and Sara Hiom, Lisa Naumann and Caroline Cerny (Cancer Research UK).

Expert paper 4: ‘Vitamin D’ was carried out by Cancer Research UK. The principal author was Ed Yong.

Expert paper 5: ‘Physical activity and the school environment’ was carried out by the South West Public Health Observatory. The principal authors were: Nicola Bowtell and Julia Verne.

Expert paper 6: ‘Outdoor workers and sports participants – sun protection challenges’ was carried out by the University of the West of England and the South West Public Health Observatory. The principal authors were: Simon Jones, Lynne Eagle and Gillian Kemp (the University of the West of England); and Julia Verne and Rebecca Hughes (South West Public Health Observatory).

Expert paper 7: ‘The impact of role models on sun protection behaviours’ was carried out by the University of the West of England and the South West Public Health Observatory. The principal authors were: Lynne Eagle, Gillian Kemp and Simon Jones (University of the West of England); and Julia Verne (South West Public Health Observatory).

Appendix B Summary of the methods used to develop this guidance

Introduction

The reviews, expert papers and economic modelling reports include full details of the methods used to select the evidence (including search strategies), assess its quality and summarise it.

The minutes of the Public Health Interventions Advisory Committee (PHIAC) meetings provide further detail about the Committee's interpretation of the evidence and development of the recommendations.

All supporting documents are listed in appendix E and are available at www.nice.org.uk/Guidance/PHIG/Wave18/4

Guidance development

The stages involved in developing public health intervention guidance are outlined in the box below.

1. Draft scope(s) released for consultation

2. Stakeholder meeting about the draft scope(s)

3. Stakeholder comments used to revise the scope(s)

4. Final scope(s) and responses to comments published on website

5. Evidence reviews, expert reports and economic modelling undertaken and submitted to PHIAC

6. PHIAC produces draft recommendations

7. Draft guidance (and evidence) released for consultation

8. PHIAC amends recommendations

9. Final guidance published on website

10. Responses to comments published on website

Key questions

The key questions were established as part of two scopes. (The first looked at information provision and the second at environmental changes and provision of resources, including multi-component interventions.)

The key questions formed the starting point for the reviews of evidence and were used by PHIAC to help develop the recommendations. The overarching questions were:

1. What are the most effective and cost-effective ways of providing information to change people's knowledge, awareness and behaviour and so prevent the first occurrence of skin cancer attributable to UV exposure?

2. What content do effective and cost-effective primary prevention messages contain? What is the most effective and cost-effective content?

3. What factors help to convey information to prevent the first occurrence of skin cancer attributable to UV exposure? What factors hinder the communication of primary prevention messages?

4. What changes to the natural or built environment are effective and cost effective at helping prevent the first occurrence of skin cancer attributable to UV exposure?

5. Which methods of supplying sun protection resources to prevent the first occurrence of skin cancer attributable to UV exposure are effective and cost effective?

6. Which multi-component interventions (a combination of one or more of: supply of sun protection resources, physical changes to environment and information provision) are effective and cost effective at helping prevent the first occurrence of skin cancer attributable to UV exposure?

7. What factors help or hinder the provision or use of the following to prevent the first occurrence of skin cancer attributable to UV exposure:

    - sun protection resources
    - physical changes to the natural or built environment (such as shelters and other areas of shade in public spaces or school grounds)
    - multi-component interventions.

These questions were made more specific for each review (see reviews for further details).

Reviewing the evidence

Effectiveness and cost-effectiveness reviews

Three reviews of effectiveness and cost effectiveness were conducted as described in appendix A (note: review 2 was a synthesis of review 1).

Identifying the evidence

The following databases and websites were searched from 1990 onwards for reviews 1 and 4:

Databases:

- ASSIA
- Cochrane Central Register of Controlled Trials (CENTRAL)
- Cochrane Database of Systematic Reviews (CDSR)
- CRD Databases (Database of Abstracts of Reviews of Effects {DARE])
- Cumulative Index to Nursing and Allied Health Literature (CINAHL)
- EconLIT
- EMBASE
- Health Management Information Consortium (HMIC) Database
- Health Technology Assessment Database (HTA)
- MEDLINE
- NHS Economic Evaluation Database (NHS EED)
- PsycINFO
- Science Citation Index
- Social Science Citation Index.

Websites:

- Cancer Research UK: www.cancerresearch.uk.org
- SunSmart (Victoria): www.sunsmart.com.au

A number of additional databases and websites were searched for review 1 and 4. Reference lists and citations were also searched and experts were contacted for review 4.

Further details of the databases, websites, additional search activities, search terms and strategies are included in each of the reviews.

Selection criteria

Inclusion and exclusion criteria for each review varied and details can be found at www.nice.org.uk/Guidance/PHIG/Wave18/4 However, in general:

- Population
  - Reviews 1 and 2: studies were included if they covered a population in an Organisation for Economic Co-operation and Development (OECD) country.
  - Review 4: studies were included from both OECD and non-OECD countries.

- Interventions
  - Reviews 1 and 2: universal and targeted interventions from any setting were included. For example:
    - ◊ one-to-one or group-based verbal advice (with or without information resources)
    - ◊ mass-media campaigns
    - ◊ leaflets, other information, teaching resources or printed material including posters
    - ◊ new media including social networking sites, e-media and text messaging.

  - Review 4: Interventions were included from any setting if they covered:

    - ◊ physical or structural changes to the built or natural environment
    - ◊ supply of sun protection resources
    - ◊ multi-component interventions combining either or both of the above with information provision.
- Comparator

  - Reviews 1 and 2: current information provision, do nothing or any other intervention listed above.
  - Review 4: no restrictions on type of comparator.

- Outcomes (reviews 1, 2 and 4):
  - reduction in the incidence of mortality or morbidity from skin cancer, including sunburn
  - change in behaviour or attitudes
  - increase in knowledge and awareness of skin cancer, its causes and how to prevent it
  - costs or cost effectiveness
  - process and implementation details relating to the intervention
  - adverse or unintended effects.

- Study design (reviews 1, 2 and 4):
  - All randomised controlled trials (RCT) and longitudinal studies were eligible for inclusion. Systematic reviews were not eligible, but were used to identify relevant primary studies via the bibliographies.

Other reviews

Two qualitative evidence reviews (reviews 3 and 5) were conducted.

Both reviews aimed to identify qualitative research on interventions to prevent the first occurrence of skin cancer attributable to UV exposure. They also aimed to synthesise the views on and experiences of (including the barriers to and facilitators for) providing this type of intervention.

Identifying the evidence

The following electronic databases and websites were searched from 1990 for reviews 3 and 5.

Databases:

- ASSIA
- Campbell Collaboration Library of Systematic Reviews
- Centre for Reviews and Dissemination databases (including DARE and HTA)
- CINAHL
- Cochrane Library (including CENTRAL)
- EMBASE
- HMIC
- MEDLINE
- PsycINFO
- Social Policy and Practice.

Websites:

- BiblioMap (EPPI-Centre): http://eppi.ioe.ac.uk/cms/
- Cancer Research UK: www.cancerresearchuk.org/
- NICE: www.nice.org.uk
- Public Health Observatories (including skin cancer hub): www.swpho.nhs.uk/skincancerhub/
- Sun Smart (Australia): www.sunsmart.com.au/

A number of additional databases and websites were searched. Reference lists and citations were also searched. Further details of the databases, search terms and strategies are included in each of the reviews.

Selection criteria

Studies were included if they:

- were carried out in OECD countries
- presented qualitative data
- were published in English.

Quality appraisal

Included papers for all five reviews were assessed for methodological rigour and quality. The NICE methodology checklists (or adapted versions of these checklists) were used for quantitative interventions and qualitative studies, as appropriate, and as set out in the NICE technical manual 'Methods for the development of NICE public health guidance' (see appendix F and H). Each study was graded (++, +, –) to reflect the risk of potential bias arising from its design and execution.

Study quality

++ All or most of the checklist criteria have been fulfilled. Where they have not been fulfilled, the conclusions are very unlikely to alter.

\+ Some of the checklist criteria have been fulfilled. Those criteria that have not been fulfilled or not adequately described are unlikely to alter the conclusions.

– Few or no checklist criteria have been fulfilled. The conclusions of the study are likely or very likely to alter.

Summarising the evidence and making evidence statements

The review data was summarised in evidence tables (see full reviews).

The findings from the evidence reviews were synthesised and used as the basis for a number of evidence statements relating to each key question. The evidence statements were prepared by the external contractors and public health collaborating centres (see appendix A). The statements reflect their judgement of the strength (quality, quantity and consistency) of evidence and its applicability to the populations and settings in the scope.

Economic analysis

An economic model was constructed for each phase incorporating data from the reviews of effectiveness and cost effectiveness. The results are reported in:

Report 1: ‘Providing public health information to prevent skin cancer: modelling strategies for primary prevention of skin cancer’

Report 2: ‘Economic analysis to inform the development of NICE public health intervention guidance on information, sun protection resources and physical changes to the environment to prevent skin cancer (phase 2)’.

They are available at www.nice.org.uk/Guidance/PHIG/Wave18/4

How PHIAC formulated the recommendations

At its meetings in March and July 2009 and May and June 2010, PHIAC considered the evidence reviews, expert reports and economic modelling to determine:

- whether there was sufficient evidence (in terms of strength and applicability) to form a judgement
- where relevant, whether (on balance) the evidence demonstrates that the intervention activity can be effective or cost effective or is inconclusive
- where relevant, the typical size of effect (where there is one)
- whether the evidence is applicable to the target groups and context covered by the guidance.

PHIAC developed draft recommendations through informal consensus, based on the following criteria.

- Strength (type, quality, quantity and consistency) of the evidence.
- The applicability of the evidence to the populations/settings referred to in the scope.
- Effect size and potential impact on the target population's health.
- Impact on inequalities in health between different groups of the population.
- Equality and diversity legislation.

- Ethical issues and social value judgements.
- Cost effectiveness (for the NHS and other public sector organisations).
- Balance of harms and benefits.
- Ease of implementation and any anticipated changes in practice.

Where evidence was lacking, PHIAC also considered whether a recommendation should only be implemented as part of a research programme.

Where possible, recommendations were linked to an evidence statement(s) (see appendix C for details). Where a recommendation was inferred from the evidence, this was indicated by the reference ‘IDE’ (inference derived from the evidence).

Appendix C The evidence

This appendix lists evidence statements from four of the five reviews provided by external contractors and public health collaborating centres (see appendix A). Please note, evidence statements from review 1, 'Providing public information to prevent skin cancer', were not used as they were superceded by review 2 which provides a synthesis of those findings.

The evidence statements derived from [+] or [++] studies are linked to the relevant recommendations. (See appendix B for the key to quality assessments.) The evidence statements are presented here without references – these can be found in the reviews and the expert paper (see appendix E for details).

This appendix also lists seven expert reports and the economic analysis reports and their links to the recommendations. It also sets out a brief summary of findings from the economic analysis.

The reviews from which evidence statements have been derived are:

- Review 2: ‘Synthesis of the West Midland health technology assessment collaboration reports: providing public health information to prevent skin cancer: review of effectiveness and cost effectiveness (dated February 2009) and addendum (dated May 2009) – including before and after studies’.

- Review 3: ‘Providing public information to prevent skin cancer: barriers to and facilitators to conveying information to prevent the first occurrence of skin cancer: a systematic review of qualitative literature’.

- Review 4: ‘Sun protection resources and environmental changes to prevent skin cancer: a systematic review’.

- Review 5: ‘Sun protection resources and changes to the environment to prevent skin cancer: qualitative evidence review’.

Evidence statement number ER2.1 indicates that the linked statement is numbered 1 in review 2.

Evidence statement number ER3.5 indicates that the linked statement is number 5 in review 3.

The reviews, expert papers and economic analysis are available at www.nice.org.uk/Guidance/PHIG/Wave18/4 Where a recommendation is not directly taken from the evidence statements, but is inferred from the evidence, this is indicated by **IDE** (inference derived from the evidence).

Where the Public Health Interventions Advisory Committee (PHIAC) has considered other evidence, it is linked to the appropriate recommendation below. It is also listed in the additional evidence section of this appendix.

Recommendation 1: evidence statement ER3.31; additional evidence: expert paper 3; economic analysis report 2; IDE

Recommendation 2: additional evidence: expert paper 2, economic analysis report 1; IDE

Recommendation 3: evidence statements ER3.2, ER3.5, ER3.6, ER3.9, ER3.10, ER3.12, ER3.13, ER3.14, ER3.15, ER3.16, ER3.17, ER3.18, ER3.19, ER3.20, ER3.23, ER3.24, ER3.25, ER3.27, ER3.28, ER3.29, ER3.31, ER3.32, ER3.34, ER5.1, ER5.2, ER5.4, ER5.5, ER5.6, ER5.8, ER5.9, ER5.10, ER5.11, ER5.12, ER5.13, ER5.14, ER5.15, ER5.16, ER5.17, ER5.18, ER5.19, ER5.20, ER5.21, ER5.22, ER5.23, ER5.24, ER5.25, ER5.26, ER5.27, ER5.28, ER5.30, ER5.31, ER5.34, ER5.35, ER5.36, ER5.38, ER5.44, ER4.45, ER4.47, ER5.48, ER5.51, ER5.53, ER5.57, ER5.58, ER5.59, ER5.60, ER5.61, ER5.62, ER5.63, ER5.64, ER5.65, ER5.67; additional evidence: expert papers 2, 3, 4, 5, 6, 7; economic analysis report 1 and 2; IDE

Recommendation 4: additional evidence: expert paper 1

Recommendation 5: evidence statements ER3.21, ER3.33, ER5.29, ER5.31, ER5.32, ER5.33, ER5.39, ER5.41, ER5.42, ER5.50; additional evidence: expert papers 2, 5, 6; IDE

Recommendation 6: evidence statements ER3.22, ER4.1, ER4.2, ER4.5, ER5.41, ER5.53; additional evidence: economic analysis report 2; IDE

Evidence statements

Please note that the wording of some evidence statements has been altered slightly from those in the evidence review(s) to make them more consistent with each other and NICE's standard house style.

Evidence statement ER3.2

Three studies (two [-] and one [+]) report low perceptions of susceptibility to skin cancer among children and older adults.

Evidence statement ER3.5

According to four studies (two [+] and two [-]), perceived severity of sun exposure was low in children, young adults, older adults and sunbed users. Children were more aware of the short-term discomfort of sun exposure than long-term risks (one study [+]). Studies in adults (two [+] and two [-]) found skin cancer was thought to be easily cured, a possible future concern, something people preferred not to think about or outweighed by the perceived short-term benefits of a tan.

Evidence statement ER3.6

Four studies (three [+] and one [-]) suggest that photo-ageing was taken seriously by participants, especially women, in one case suggesting that this was perceived as a more serious and real concern than skin cancer.

Evidence statement ER3.9

One study (+) suggests that knowledge of the benefits of sun protection may not be translated into safe sun practices, as a tan is seen as socially beneficial.

Evidence statement ER3.10

One study (-) found older adults may have misinformation about the causes of skin cancer, limiting their perceptions of the benefits of sun protection. In addition, four studies (two [+], one [++] and one [-]) revealed erroneous beliefs that getting a tan was protective of skin damage and in two studies (both [+]), participants believed that getting burnt was the prelude to a deep tan, and that high protection sunscreen might prevent deep tanning.

Evidence statement ER3.12

Seven studies (two [-], four [+] and one [++]) showed that tanned people are seen as healthy by children, adolescents and adults. One study (+) reported that the sun was positively regarded as a source of vitamin D.

Evidence statement ER3.13

Three studies (from Scotland, Australia and Canada) (two [+] and one [++]) describe negative associations with white, untanned skin, which was described as unhealthy and indicative of being unfit.

Evidence statement ER3.14

Seven studies among children, adolescents and adults (two [-], four [+] and one [++]), describe tanned skin as being physically attractive. Two studies (both [+]) thought that bad skin and acne were cleared up by UV exposure.

Evidence statement ER3.15

Peers are reported as an important influence on UV exposure in three studies among adolescents and sunbed users (two [+] and one [++]) as they may react positively to tans.

Evidence statement ER3.16

Two UK studies (one [-] and one [+]) show that a tan signifies a good holiday, especially a holiday abroad, and could be seen as a necessary ‘symbolic souvenir’.

Evidence statement ER3.17

Sun protection through use of sunscreen, wearing hats and covering up with long sleeves all had limitations. Sunscreen use is seen as a hassle in six study reports of qualitative research (three [+] and three [-]) due to its expense, mess, time to apply and potential to cause irritation or allergies.

Evidence statement ER3.18

In three studies (two [-] and one [+]), parents say that children were uncooperative when it came to applying sunscreen.

Evidence statement ER3.19

Four studies (two [-] and two [+]) highlight impracticalities of hat-wearing which limits children's activities, and may be rejected as unfashionable.

Evidence statement ER3.20

In three studies (one [-] and two [+]), covering up through wearing long-sleeved tops was seen as uncomfortable in the heat. Rash vests and wetsuits may be better for young children on the beach, as t-shirts may be repeatedly removed (two [-] studies).

Evidence statement ER3.21

Three studies (two [-] and one [+]) discuss structural or policy limitations to skin cancer prevention in schools, such as limited ability to change scheduling around lunchtime to avoid the hottest part of the day.

Evidence statement ER3.22

Provision of shade outside is seen as a possible strategy, but costly and not always easy to use by playing children (two [-] and one [+]).

Evidence statement ER3.23

Eight studies of qualitative research (four [+], three [-] and one [++]) discuss the limitations of parental responsibility for protecting children from sun exposure.

Evidence statement ER3.24

Four studies (one [-] and three [+]) discuss the responsibility of parents for their children's safe-sun behaviour. This responsibility may be limited by parents' failure to demonstrate sun-safe habits themselves due to ambivalence about their own desire for tanned skin (one [-] and one [+]). In addition, parents aren't always with their children to ensure safe-sun behaviour (one [+] study).

Evidence statement ER3.25

Five studies (one [-], three [+] and one [++]) note that the transition from child to adolescent is marked by increasing independence, or rebellion, and that this may have negative effects on safe-sun behaviour.

Evidence statement ER3.27

'Incidental tanning', obtained by simply being outdoors, was seen positively in seven studies of qualitative research, for both children and adults (three [+], three [-] and one [++]).

Evidence statement ER3.28

Such attitudes to this incidental sun exposure, makes sunscreen use less likely on overcast days (one [+]), in the winter (one [+] and one [-]), and for children when going out to play somewhere other than the beach (one [+]) or for a shorter time than the whole day (one [-]). People in the UK may be more likely to use sunscreen on holiday abroad than when at home (one [-]).

Evidence statement ER3.29

Eleven studies qualitative research (five [+] and six [-]) discuss people's cues to protective action against UV exposure. These include the positive influence of parents and other adults for younger children (one [+] and one [-]) and peers for older children (one [-]), knowing someone who has had skin cancer (two [+] and two [-]), and media campaigns (six [-] and three [+]).

Evidence statement ER3.31

Media campaigns need to engage younger children (two [-] and one [+]) while not alienating older children (one [+] and one [-]), it is also suggested that they need to change regularly to maintain their impact (one [+]) and that shock images may appeal to older boys (one [-]).

Evidence statement ER3.32

Two studies of UK-based qualitative research address self-efficacy in skin cancer prevention with participants reporting examining themselves for signs of skin cancer (one [+] and one [-]). Skin cancer is understood as largely preventable and identifiable early, by those taking personal responsibility for their skin through self-surveillance and personal responsibility (one [+]).

Evidence statement ER3.33

One qualitative study (++) uses the analytic constructs of framing and narrative to understand the differences in the construction of skin cancer public health policy in Australia, Canada and England. While skin cancer is conceived as a growing public health issue in England, public health messages focus on expectations of reasonable protective factors and moderate UV exposure. This is because the population is not considered sensitised to skin cancer and does not want to hear messages that promote avoiding the sun.

Evidence statement ER3.34

One qualitative study (+) uses cognitive interviewing to refine the way questions were asked for a survey tool. The capacity for misunderstanding that it demonstrates underlines the importance of piloting any information material aimed at primary prevention of skin cancer with target groups.

Evidence statement ER4.1

There is a limited body of evidence on the effect of change to the natural or built environment in the prevention of skin cancer in educational settings and

no evidence from other settings. No studies were identified that focused solely on the impact of changing the timing of outdoor activities.

Evidence statement ER4.2

There was evidence from a single good quality (++) randomised controlled trial (RCT) undertaken in Australia that adolescents in years 7 to 12 used rather than avoided newly provided sail shade areas at secondary schools, during lunch time periods. An extra 2.7 students were observed to have used the shaded sites (95% confidence interval [CI]: 0.7 to 4.7) during Spring/Summer term compared to unshaded sites in the control schools (p=0.011).

Evidence statement ER4.5

Three studies focused on implementation, one (++) study reported that, on average, only six students used the shaded areas at any one time, despite the relatively large size of the sails. The authors suggest that optimal use of shade sails may be limited by friendship groups avoiding encroaching on other student's space. One (-) study did not contain evidence pertinent to the secondary review questions. Another (-) study reported that all subgroups had lower UVR exposure at the shaded site compared to the unshaded site except for boys aged 1–4 years who were exposed to 23.1% compared to 16.7% of available UVR at the shaded and unshaded sites respectively. In this later (-) study gender and environment (high and low quality) were statistically significant predictors of step count a linear mixed model.

Evidence statement ER5.1

Two studies (both [++]) report that the experience of melanoma or pre-cancerous moles by participants or people they know, or a family history of malignant melanoma, increase perceived risk.

Evidence statement ER5.2

Five studies (three [-] and two [++]) report that the risk of skin cancer is not appreciated or is seen as not of immediate concern. This perception is

particularly stated by children (aged 6–8 years) and young people (aged 12–25 years approximately), who view the risk as too distant to be a serious concern.

Evidence statement ER5.4

Three studies of adults (one [++], one [-] and one [+]) report that people are aware of the risks of skin cancer, but avoid thinking about them, or adopt an optimistic framing that minimises their own perceived susceptibility, such as assuming that others' exposure to risk factors must be higher than their own.

Evidence statement ER5.5

One US study (++) discusses the communication of risks within families where a member has had an experience of skin cancer. It found that people diagnosed with cancer usually discussed risk with their families, and that women took a leading role in communication.

Evidence statement ER5.6

Five studies of young people and adults (two [++], two [+] and one [-]) report the belief that sun exposure provides 'resistance' to skin damage, burning or cancer in the future. In particular, outdoor workers reported such beliefs in two studies (one [-] and one [+]), and parents in one (++).

Evidence statement ER5.8

Perceived severity of skin cancer was low in seven studies across a wide range of age groups (aged 6 years to over 60 years) (four [++], two [+] and one [-]). In three studies participants thought that skin cancer was easy to treat (all [++]). In one study (++) with participants aged 6–8 years, there was a lack of understanding about what skin cancer was or the risks of skin cancer. A study of farmers in the USA (+) finds that they did not see skin cancer affecting their day-to-day work.

Evidence statement ER5.9

Seven studies (three [++], three [+] and one [-]) report that skin ageing was seen as a serious consequence of sun exposure. Two studies (one [++] and

one [+]) find that skin ageing is perceived as a more serious consequence of sun exposure than is skin cancer. Four studies (two [++] and two [+]) report that skin ageing is seen as a more serious consequence by women than it is by men.

Evidence statement ER5.10

Participants in most studies (two [++] and two [+]) used sun protection, principally sunscreen, in order to offset the perceived risks of sun exposure including skin cancer and skin ageing (two [+] and one [++]). Avoiding sunburn and the sun's heat and glare were mentioned as a benefit of sun protection in three studies (one [+], one [-] and one [++]).

Evidence statement ER5.11

Participants in two studies (one [+] and one [++]) said that using sun protection enabled them to stay in the sun for longer when playing sports.

Evidence statement ER5.12

Two studies (one [-] and one [++]) of parents and school staff stated the benefits of promoting sun protection to young people to help them acquire positive long-term habits.

Evidence statement ER5.13

Twelve studies (six [++], three [+] and three [-]) report positive perceptions of a tanned appearance, that is, that a tanned appearance is perceived as attractive. Two studies (one [++] and one [+]) report that a tanned appearance increases confidence and self-esteem.

Evidence statement ER5.14

Three studies (two [++] and one [+]) report that the degree of tan colour was important in shaping perceptions of tanned appearance, with a deep tan not necessarily seen as desirable.

Evidence statement ER5.15

Nine studies (five [++], two [+] and two [-]) found that a tanned appearance is seen as healthy. Of these, three studies (all [++]) note that a tanned appearance indicates an active, outdoors lifestyle.

Evidence statement ER5.16

Three studies (one [++] and two [+]) report the belief that ultraviolet exposure is beneficial because it provides vitamin D.

Evidence statement ER5.17

Two studies (one [++] and one [+]) report that sun exposure is believed to protect against future skin damage or cancer by increasing ‘resistance’.

Evidence statement ER5.18

Three studies discuss the perception that outdoor activities which involve sun exposure are healthier than indoor activities, both among adults (two [++]) and children (one [-]). One study (-) finds this perception to be linked to the freedom to play actively for children.

Evidence statement ER5.19

Participants in three studies (all [++]) distinguished deliberate from incidental tanning, and expressed the belief that incidental tanning was less dangerous or less likely to require protection.

Evidence statement ER5.20

One study (++) finds that participants preferred to see themselves as tanning incidentally, rather than deliberately. This may be because deliberate tanning has ‘unhealthy’ connotations but incidental tanning from outdoor activities does not.

Evidence statement ER5.21

Three studies (two [+] and one [++]) compared sunbed use to sun exposure. Most of the participants in these studies believed that sunbeds were more dangerous than sun exposure.

Evidence statement ER5.22

Six studies (five [++] and one [-]) identify the unfashionable or unattractive appearance of protective clothing as a barrier to their use among children and young people (aged 6–20). Two studies (one [-] and one [++]) find that protective clothing, such as hats, would be more acceptable if they were fashionable and attractive.

Evidence statement ER5.23

Three studies (one [++] and two [+]) find that young adult and adult participants see sun protection behaviour as not strongly supported by social norms within their communities.

Evidence statement ER5.24

Five studies (one [++], two [+] and two [-]) describe a strong association between sunscreen use and particular contexts, such as the beach and being on holiday.

Evidence statement ER5.25

One study (++) finds that young people (ages 12–17 years) see media messages and parental behaviours regarding sun protection as focused on young children and not relevant to themselves.

Evidence statement ER5.26

One study (+) finds that men see sunscreen use as unmasculine.

Evidence statement ER5.27

Ten studies (four [++], three [+] and three [-]) described the inconvenience of sun protection resources as barriers to their use. The particular issues which contribute to the perception of inconvenience are: the need to carry and remember sun protection resources (one [+], one [-] and one [++]); the ‘messiness’ of sunscreen (three [+], two [-] and one [++]); the awkwardness of hats and sunglasses which may fall off or interfere with activities (two [++] and

one [+]); and the inconvenience of making use of shade structures by children and young people (one [-]).

Evidence statement ER5.28

Four studies (two [++], one [+] and one [-]) describe physical discomfort as a barrier to the use of protective clothing.

Evidence statement ER5.29

One study (++) finds that school staff see a number of practical barriers to encouraging children to use sunscreen before outdoor activities, including monitoring application, touching children to help with application, students sharing sunscreen, and parental permission.

Evidence statement ER5.30

Six studies (three [++], two [+] and one [-]) said that the cost of sun protection resources was a barrier to their use. This primarily concerned sunscreen purchased by individuals, with one study (-) mentioning the cost of hats as a barrier to implementing compulsory hat policies in low socioeconomic status (SES) schools, and one (++) the cost of installing shade structures in schools. However, one study (+) that focused on farmers in the USA said that cost was not a barrier.

Evidence statement ER5.31

Other practical barriers to sun protection are: children being uncooperative with the application of sunscreen (one [++] and one [+]); the perceived ineffectiveness of sunscreen in stopping burning (one [+]); and the perception of adverse health consequences of sunscreen use such as acne (one [+] and one [++]), allergic reactions (one [++]), and potential long-term toxicity (one [++] and one [+]).

Evidence statement ER5.32

One study (++) reports potential institutional barriers to sun protection in schools, including: the cost of implementing new policies for schools; time

constraints on school staff; the difficulty of changing outdoor structures to provide shade; concerns about liability; and the need for staff training.

Evidence statement ER5.33

Two studies (one [++] and one [-]) found that some school staff felt that sun protection was not a high-priority issue, because of the limited time children spent outdoors. Participants in one study (-) felt that sun protection detracted from teaching and in one other study (++), school staff said they felt overwhelmed with policies and initiatives on a wide range of issues.

Evidence statement ER5.34

Effective communication with parents was identified as a potential barrier in one study (++). The cost to parents was also mentioned as a concern relating to compulsory hat regulations in one study (-).

Evidence statement ER5.35

Six studies, most in school settings, found that children aged 6–8 years (one [++]), young people aged 12–17 years (three [++] and one [-]), and young adults aged 18–25 years (one [+]) identified parents, especially mothers, as important sources of positive encouragement and practical support for adopting sun protective behaviours. One further study (+) of older women aged 75 to 90 years found that as children, they had also been positively influenced by parents. Other adults, such as teachers and lifeguards, were identified as sources of positive encouragement for children aged 6–8 years (one [++]) and young people aged 8–17 years (one [-] and one [++]) to adopt sun protective behaviours.

Evidence statement ER5.36

Seven studies found differences between children (approximately 8–13 years) and older young people (approximately 14–17 years) in sources of positive encouragement to use various forms of sun protection. One study (++) found that parents or carers apply sunscreen more often to younger children, while older children are more likely to apply it themselves. Five studies (three [++]

and two [-]) found that younger children are more likely to listen to parents (or other adults such as teachers) advice to use sun protection such as sunscreen or clothing, because of their role as authority figures. Older young people are more likely to be influenced by their peers. Young people in these studies described the shift towards peer influence as part of a process of asserting their independence from authority. However, the remaining study (++) found that older young people (aged 16–17 years) felt themselves to be more receptive to health messages than younger children.

Evidence statement ER5.38

Adults and young people in five studies (four [++] and one [-]) stated that knowing someone with skin cancer may act as a cue to adopt sun protection behaviours in general.

Evidence statement ER5.39

Two studies from New Zealand and the US (one [-] and one [++]) found that primary school staff were willing to implement school-wide sun protection policies such as: physical shade structures or trees; ‘no hat, no play’ or ‘no hat, play in the shade’ rules; provision of free sunscreen; or rescheduling outdoor activities. Obtaining funding for such policies, especially environmental change, was a barrier in some cases. One further Australian study (++) notes that policies such as ‘no hat, no play’ are common in Australian primary schools, but are rare in secondary schools.

Evidence statement ER5.41

One study (++), a process evaluation of a sun protection intervention (‘Pool Cool’) at outdoor pools, finds that signs, sunscreen pumps and shade structures were viewed positively and frequently used by pool-goers

Evidence statement ER5.42

In one study (++), recreation staff indicated that few sun protection policies had been implemented, and were conscious that staff often did not model

good sun practice, but were generally willing to implement sun protection policies.

Evidence statement ER5.44

Three studies (one [++], one [+] and one [-]) of young adults (18 to 25 years) and adults discuss the influence of the media on individuals' behaviour. All of these studies show the belief that representations in the media may have an adverse effect on sun protection behaviours.

Evidence statement ER5.45

Three studies from the USA and Australia (two [++] and one [-]), show people of all age ranges to be more likely to use sun protection in general in summer and in sunny weather.

Evidence statement ER5.47

Two studies (one [++] and one [-]) describe adults (aged 16–54 years) putting on a T-shirt or applying sunscreen only after beginning to burn.

Evidence statement ER5.48

Five studies identify factors which could be addressed by resource provision interventions such as making available sunscreen or protective clothing. These factors include the cost of sunscreen (two [++] and two [+]), and the inconvenience of remembering to carry sunscreen (one [+] and one [-]) or protective clothing (one [++]). These barriers appear to be particularly relevant for children and young people (aged 8 to 25 years).

Evidence statement ER5.50

Two studies (both [++]) investigate service providers' views towards potential resource provision interventions, finding that school staff and leisure staff are positive about the potential to implement sun protection interventions. However, they have concerns relating to practical requirements such as time and funding, and are not always confident that their own roles and responsibilities will be clearly defined.

Evidence statement ER5.51

A wide range of other barriers are identified in the studies. These include physical discomfort (two [++]; one [+] and one [-]), inconvenience of use (four [++], three [+] and three [-]) and social barriers including appearance and prevailing norms (five [++], two [+] and one [-]). Not all resources are acceptable to all targeted populations.

Evidence statement ER5.53

One study (-) found that using environmental shade may reduce the spontaneity of outdoor activities, especially for younger children. One study (++) found that school authorities see the cost of providing environmental shade as a barrier.

Evidence statement ER5.57

Five studies (three [-] and two [++]) found that people do not think skin cancer is a serious risk. Twelve studies (six [++], three [+] and three [-]) found that a tanned appearance is considered attractive.

Evidence statement ER5.58

Three studies (all [++]) found that incidental tanning is perceived as less risky than deliberate tanning. The use of protection is associated with deliberate tanning, such as at the beach, in three further studies (two [+] and one [++]). This suggests that sun protection is seen as less salient where sun exposure is incidental and not deliberate. Two studies (one [++] and one [+]) indicate that this may be particularly true for men.

Evidence statement ER5.59

Three studies found that service providers, including school staff (one [-] and one [++]) and leisure staff (one [++]), have positive attitudes towards resource provision and environmental change interventions. However, two studies (both [++]) report concerns about the potential extension to their responsibilities, and one study (++) raises the prospect of an overload of policies and recommendations.

Evidence statement ER5.60

Two studies (one [+] and one [-]) found that men were less likely than women to deliberately sunbathe, but also less likely to use sun protection. Three studies report the perception that sunbathing (one [++]) or sunbed use (one [++] and one [-]) are unmasculine.

Evidence statement ER5.61

Three studies (two [++] and one [+]) found that women, especially mothers, tend to take the lead role in promoting sun protection behaviours within the family.

Evidence statement ER5.62

Four studies (two [++] and two [+]) found that women were more concerned than men about how the sun affects their appearance, both negatively (skin ageing and wrinkles) and positively (tanned appearance).

Evidence statement ER5.63

Seven studies (four [++], two [+] and one [-]) found that young children are more likely to be influenced by parents, particularly mothers, and school staff.

Evidence statement ER5.64

Four studies (three [++] and one [-]) found that adolescents are less likely to be influenced by authority figures and adults and may assert their independence by not following sun protection messages. One study (++) found that adolescents see sun protection as primarily concerning younger children.

Evidence statement ER5.65

Four studies (two [-], one [++] and one [+]) found that parents of young children are more receptive than the general population to sun protection messages. However, three studies (two [-] and one [++]) found that parental concern relating to young children’s sun exposure does not necessarily

translate into concern about their own sun exposure, or to that of older children.

Evidence statement ER5.67

Two studies (one [-] and one [+]) focus on the views of outdoor workers. Both these studies found that outdoor workers do not feel that sun protection is a priority, and that they have little awareness of the risks of sun exposure.

Additional evidence

Expert papers

The seven expert papers with explicit links to the recommendations were:

- Expert paper 1: 'A summary of key messages to be included in public information resources for the primary prevention of skin cancer'.
- Expert paper 2: 'Summary of current policy drivers and national practice overview'
- Expert paper 3: 'National campaigns (UK and worldwide)'
- Expert paper 4: 'Vitamin D'
- Expert paper 5: 'Physical activity and the school environment'
- Expert paper 6: 'Outdoor workers and sports participants – sun protection challenges'
- Expert paper 7: 'The impact of role models on sun protection behaviours'.

Economic analysis reports

- Economic analysis report 1: 'Providing public health information to prevent skin cancer: modelling strategies for primary prevention of skin cancer'
- Economic analysis report 2: 'Economic analysis to inform the development of NICE public health intervention guidance on information, sun protection

resources and physical changes to the environment to prevent skin cancer (phase 2)'.

Economic analysis

The review of studies on providing information to prevent skin cancer (report 1) failed to identify any existing economic analyses that were directly applicable to the UK. (Two non-UK studies were identified.)

Three types of intervention were modelled:

- provision of a 25-page handbook for parents to use with children in the home
- information delivered to children as part of the school curricula
- interactive group sessions delivered to university students.

It was only possible to develop a causal chain between the intermediate outcomes arising from the home-based intervention and the prevention of skin cancer and thus estimate a cost per quality-adjusted life year (QALY).

For the school and university-based interventions, it was not possible to complete the causal chain. However, it was possible to give a reasonable estimate of the cost per participant and a threshold analysis was undertaken to assess the change in exposure to ultraviolet light that would be needed to make them cost saving or cost effective. Thresholds of £20,000 and £30,000 per QALY were used.

The estimated cost per QALY for the home-based intervention was £6700 (if each handbook cost 90 pence). However, there is considerable uncertainty in these results. The threshold analysis suggests that, if a reasonably inexpensive intervention can achieve similar changes in behaviour in less sunnier climates, then it is likely to be cost effective. (That is, in terms of the benefits of reducing the incidence of skin cancer.)

Only one study of the cost effectiveness of a multi-component intervention was identified in report 2 and it was undertaken in a community setting.

In response, an economic model was developed to estimate the cost effectiveness of the provision of shade and multi-component interventions delivered in six different settings. In addition, a break-even analysis was undertaken to estimate the effect size needed to ensure a mass-media intervention would be cost effective.

The analysis indicates that none of the interventions modelled are cost effective when compared with an incremental cost-effectiveness ratio (ICER) threshold of £20,000 per QALY gained.

However, if the cost of providing shade could be reduced by incorporating it into the design of new buildings and other environments from the outset, this could significantly improve the ICER. For example, in the threshold analysis when the cost per person was reduced from £1.82 to £0.015, the cost per QALY was just above the £20k threshold (£20,180). (This assumes these shaded areas would be used in similar way in the UK, where the climate is cooler.)

The break-even analysis for a mass-media campaign indicates that the use of sunscreen would need to increase between 2 and 6.6 percentage points for the campaign to be cost effective. This would cost an estimated £0.0028 per person per year for a low-cost campaign and £0.0093 per person per year for a high-cost campaign.

The main lesson learned from such analysis is that interventions need to have a very low unit cost to be cost effective.

Appendix D Gaps in the evidence

The Public Health Interventions Advisory Committee (PHIAC) identified a number of gaps in the evidence related to the programmes under examination based on an assessment of the evidence and expert comment. These gaps are set out below.

1. There was very limited, UK-based evidence on information provision, supply of resources and changes to the physical environment to protect against skin cancer caused by UV rays. (This includes multi-component interventions.) The only available evidence either demonstrated a small effect size or did not provide detail about the population groups that benefited – or how messages should be framed for different population groups. (**Source**: Evidence reviews 1–5.)

2. Details were often missing from the descriptions of interventions to protect people against skin cancer. This included details on: content (such as what was delivered and by whom), how frequently and for how long the intervention was delivered, the economic costs and benefits, any variation in effectiveness and cost effectiveness in relation to factors such as age and ethnicity and how long the intervention was effective or cost-effective. (**Source**: Evidence reviews 1, 2 and 4)

3. Data on the barriers to, and motivators for, behaviour change for specific population groups (such as outdoor workers) was very limited. In particular, it was not clear what sources of information different population groups use. It was also unclear how information about skin cancer influences the way they protect themselves from the sun and what motivates different groups to change their behaviour. (**Source**: Evidence reviews 3 and 5.)

4. There was a lack of evidence on the specific components of an intervention that make it effective or cost effective. For example, few studies answered questions such as, 'Does effectiveness depend on the

intervener?', 'Does the intensity or duration influence effectiveness or duration of effect?' or 'Which component of the intervention had an effect or most effect?' (**Source**: Evidence reviews 1, 2 and 4.)

5. Routine data collection (for example, on skin cancer rates for different population groups) was not standardised, recorded and made accessible for research. (**Source**: Expert paper 6.)

6. There was little evidence on which factors help or hinder the provision or use of skin protection resources according to someone's socioeconomic status and ethnicity. (**Source**: Evidence reviews 3 and 5.)

7. No evidence was identified relating to the involvement of private sector organisations (such as sunscreen manufacturers) in the design or delivery of information campaigns and interventions. (**Source**: evidence reviews 1-5.)

8. There was no evidence on the potential effectiveness of product placement (a form of advertisement where branded goods are placed within television programmes). In particular, there was no evidence to determine if this might be a useful way to communicate sun protection messages to specific at-risk groups. (At-risk groups include young people and outdoor workers. (**Source**: evidence reviews 1, 2 and 4.)

Appendix E Supporting documents

Supporting documents are available at www.nice.org.uk/Guidance/PHIG/Wave18/4. These include the following.

- Evidence reviews:
  - Review 1: 'Providing public information to prevent skin cancer'.
  - Review 2: ‘Synthesis of the West Midland health technology assessment collaboration reports: providing public health information to prevent skin cancer: review of effectiveness and cost effectiveness (dated February 2009) and addendum (dated May 2009) – including before and after studies’
  - Review 3: ‘Providing public information to prevent skin cancer: barriers to and facilitators to conveying information to prevent the first occurrence of skin cancer: a systematic review of qualitative literature’
  - Review 4: ‘Sun protection resources and environmental changes to prevent skin cancer: a systematic review’
  - Review 5: ‘Sun protection resources and changes to the environment to prevent skin cancer: qualitative evidence review’.

- Economic modelling:
  - Report 1: ‘Providing public health information to prevent skin cancer: modelling strategies for primary prevention of skin cancer’
  - Report 2: ’Economic analysis to inform the development of NICE public health intervention guidance on information, sun protection resources and physical changes to the environment to prevent skin cancer (phase 2)’.

- Expert papers:
    - Expert paper 1: ‘A summary of key messages to be included in public information resources for the primary prevention of skin cancer’
    - Expert paper 2: ‘Summary of current policy drivers and national practice overview’
    - Expert paper 3: ‘National campaigns (UK and worldwide)’
    - Expert paper 4: ‘Vitamin D’
    - Expert paper 5: ‘Physical activity and the school environment’
    - Expert paper 6: ‘Outdoor workers and sports participants – sun protection challenges’
    - Expert paper 7: ‘The impact of role models on sun protection behaviours’.

For information on how NICE public health guidance is developed, see:

- ‘Methods for development of NICE public health guidance (second edition, 2009)’ available from www.nice.org.uk/phmethods

- ‘The NICE public health guidance development process: An overview for stakeholders including public health practitioners, policy makers and the public (second edition, 2009)’ available from www.nice.org.uk/phprocess