# Committee on Medical Aspects of Radiation in the Environment (COMARE)

## Twenty-first report

Health effects of ultraviolet radiation from artificial tanning devices in the UK and their control

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# Preface

i. The Committee on Medical Aspects of Radiation in the Environment (COMARE) is a Department of Health and Social Care expert committee that provides independent expert advice to the UK Government on the health effects of radiation. Over the 40 years of its existence, the committee has provided advice on a range of issues, from childhood cancer clusters in the vicinity of nuclear installations to risks of skin cancer caused by ultraviolet (UV) radiation from sunbeds and the significance and control of radiation doses resulting from the use of computed tomography (CT) in the UK.

ii. The aim of this report is to provide advice to the four UK health departments on the health impact of UV radiation from artificial tanning devices in the UK, as an update to the 13th COMARE Report (COMARE, 2009).

iii. This update reviews more recent science and examines the current applicability of the conclusions and recommendations of the 13th COMARE Report. The implementation of the previous recommendations by the four UK nations is compared, international advice is considered, and updated conclusions and recommendations are provided.

# Lay summary

S.1 Ultraviolet (UV) radiation from the sun and also from sunbeds causes damage to skin, both structural damage that ages and wrinkles the skin, and damage to DNA within cells that can lead to cancer. In particular, a form of skin cancer called melanoma affects over 19,000 people every year in the UK with over 2,600 deaths[1]. Sunbed use contributes to these melanoma cases and deaths, with an estimate of around 100 deaths per year. Risks of skin cancer from UV exposure are greatest for people with fair skin. Risks from sunbeds are greatest for those who begin use at younger ages.

S.2 UV radiation, including from sunbed use, can also cause photosensitivity reactions of the skin, and damage the eyes, causing some types of cataract and cancer, and other eye conditions.

S.3 Estimates of the number of people using sunbeds in the UK are variable, but generally suggest that there have not been large changes in numbers from those obtained in studies carried out 30 years ago. The numbers of commercial sunbed outlets in the UK do not appear to have declined appreciably since 2009, suggesting that use has also not been much reduced, despite the introduction of laws to control use. There are also indications of increasing use by young people.

S.4 Some sunbed operators are making false and unsubstantiated claims of health benefits and this is reinforced by the prevalence of such misinformation on social media platforms.

S.5 In its 13th Report published in 2009, COMARE made a number of recommendations on the control of sunbed use. These controls are reflected in laws introduced in England, Wales, Scotland and Northern Ireland. In each case, use of commercial sunbeds by young people under the age of 18 was prohibited. However, the four nations took different approaches on other control measures, with England introducing the fewest.

S.6 In this report, COMARE concludes that the scientific evidence for damage to health from sunbeds is clear and the basis for the previous recommendations remains unchanged.

S.7 COMARE recommends that government reconsiders the 2009 recommendations and gives thought to the different approaches by the four nations to the protection of the public and the effectiveness of the measures introduced. Measures to revisit include the supervision of sunbed use in commercial outlets, the training of staff, the better provision of health information and requirements to wear protective eyewear, and the licencing and inspection of premises.

S.8 Government will also wish to consider whether it is appropriate to introduce a complete ban on the commercial use of sunbeds. While a ban should save lives and reduce costs of cancer treatment, there are wider policy considerations, for example in relation to the constraint on freedom of individual choice, which applies to a range

[1] Melanoma skin cancer statistics | Cancer Research UK – accessed 1 June 2026

of self-imposed risks. If government opts for a ban, this will require careful planning, with supporting public awareness campaigns and strong enforcement.

S.9 Public information campaigns are an essential accompaniment to any initiatives to control sunbed use. To be effective, such campaigns need to address the inducements used to promote sunbed use and employ evidence-informed arguments to counter them.

# Chapter 1. Introduction

1.1 Ultraviolet (UV) radiation originates primarily from the sun and is also the effective agent emitted by artificial tanning devices. There is strong evidence that exposure to UV radiation causes damage to the skin and most importantly increases the risk of the development of skin cancer (WHO, 2017). Recognition of risks has led to campaigns to promote protection from excessive exposure to the sun in many countries and to controls on the use of sunbeds and other tanning devices (WHO, 2017, 2024).

1.2 UV radiation from the sun is divided into two main bands, based on wavelength – UV-A (315-400 nm) and UV-B (280-315 nm). There is a third band, UV-C (100-280 nm), but these shorter wavelengths are completely absorbed by the Earth's atmosphere and so the exposures that people experience are a combination of UV-A and UV-B (COMARE, 2009; WHO, 2017). Reductions in the ozone layer due to pollution increase the overall penetration of UV from the sun and the proportion of UV-B. Sunbeds also emit UV-A and UV-B but generally in different proportions than from the sun.

1.3 Skin cancers are extremely common, with two main categories: melanoma and keratinocyte cancers. Melanomas originate in melanocytes, pigment-forming cells that are located primarily in the basal layer of the epidermis. Keratinocyte cancers are of two main types, basal cell carcinoma (BCC) and squamous cell carcinoma (SCC). BCC is thought to originate in the stem cells that give rise to the majority of epidermal cells and SCC in committed epidermal cells. Melanoma is the least common skin cancer but the most frequently fatal. For example, the British Association of Dermatologists give incidence data for England for 2019 of 15,332 melanomas, 47,977 SCC and 158,934 BCC and fatalities for 2020 of 2007 from melanoma and 794 from SCC[2]; BCC is rarely fatal. UV radiation is a risk factor for each type of skin cancer (WHO, 2017).

1.4 COMARE previously considered the topic of risks from the use of sunbeds in its 13th Report: *The health effects and risks arising from exposure to ultraviolet radiation from artificial tanning devices* (COMARE, 2009). Among the conclusions of the 13th COMARE Report, it was noted that intermittent high dose rate UV radiation exposure, as emitted by sunbeds, is associated with increased risk of melanoma at all ages, and that sunbeds allow exposures exceeding the effective irradiance of midday Mediterranean sun, in intense doses and over prolonged periods of time. A modelled estimate was provided that sunbed use could result in around 100 deaths from melanoma each year in the UK, with incidence around four times higher, and reference was made to an assessment by the International Agency for Research on Cancer (IARC) that first use of sunbeds before the age of 35 years increases the risk of melanoma by 75% (COMARE, 2009).

1.5 The overall conclusion of the 13th COMARE Report was that the health risks associated with sunbed use outweigh any perceived psychological or cosmetic benefits; that the use of sunbeds is not associated with added protection from

[2] British Association of Dermatologists (2022) - New data shows a record 224,000 skin cancers in England in 2019

exposures to the sun, and that their use to promote Vitamin D synthesis is not recommended (COMARE, 2009).

1.6 The 13th COMARE Report made several recommendations on the regulation of the commercial use of sunbeds which can be summarised as:

- Commercial use by persons under 18 years of age should be prohibited; sale to, or hire by, this age group should also be prohibited.
- Unsupervised use and/or self-determined operation in commercial outlets should be prohibited.
- Commercial outlets should be licensed and registered, including registration of the types and power of tanning devices on the premises.
- Commercial outlets should provide protective eyewear, and its use should be compulsory.
- Written information on health risks should be provided to users. Informed consent should be obtained from clients prior to use. Use of sunbeds by persons in at-risk groups should be discouraged.
- The promotion of unproven health benefits should be prohibited.
- Sunbeds should adhere to British and European Standard (BS EN 60335-2-27: 2003) and the recommendations of the Scientific Committee on Consumer Products, in particular that sunbeds should not exceed an erythemal-effective irradiance of 0.3 $Wm^{-2}$.
- Local authorities should have a duty to inspect commercial outlets. Operator training should be required and competence determined.

1.7 The 13th COMARE Report also recommended health education on the risks of natural (solar) and artificial sources of UV radiation, particularly from sunbeds and directed towards children. Finally, it was recommended that there should be more research on sunbed use and the risk and aetiology of melanoma and other skin cancers.

1.8 Legislation banning the use of sunbeds in commercial settings by clients under 18 years of age was introduced in Scotland in 2008, followed by similar legislation in England and Wales in 2010/2011 and in Northern Ireland in 2011[3]. Although legislation in the four nations is consistent with regard to the ban on use of sunbeds at ages less than 18 years, there are differences in requirements relating to other controls, including supervision, provision of health information, and requirement for protective eyewear (see Chapter 5).

1.9 The aim of this report is to provide a short update to the 13th COMARE Report (COMARE, 2009). This update provides an overview of more recent science and examines the current applicability of the conclusions and recommendations of the

[3] Public Health etc. (Scotland) Act 2008; Public Health etc (Scotland) Act 2008 (sunbeds) Regulations 2009;
Sunbeds (Regulation) Act 2010;
Sunbeds (Regulation) Act 2010 (Wales) Regulations 2011;
Sunbeds Act (Northern Ireland) 2011

13th COMARE Report. The implementation of the previous recommendations by the four UK nations is compared, international advice is considered, and updated conclusions and recommendations are provided, including on whether an outright ban of sunbed use should be considered.

# Chapter 2. Sunbeds and skin cancer

2.1 The 13th COMARE Report recognised that sunbed use is associated with an increased likelihood of melanoma, referencing a statement from the IARC that, for use before the age of 35 years, the risk of melanoma, relative to non-users, was 1.75; that is, a 75% increase in risk (IARC, 2007). However, it was acknowledged that data on the risk of melanoma resulting from sunbed use were limited, as sunbeds had been in widespread use for a relatively short period of time and there were concerns that as melanoma has a long latency period the full measure of risk was not yet established.

2.2 Since then, there have been further reviews and meta-analyses on the association between sunbed use and melanoma (An et al., 2021; Boniol et al., 2012; Burgard et al., 2018; Colantonio et al., 2014). The most recent analysis considered 36 studies with 14,583 melanoma cases and reported that, compared to 'never users', the relative risk of melanoma was 1.27 [1.16, 1.39][4] for those who were ever users of sunbeds, with an increase to 1.47 [1.16, 1.85] when use was started before the age of 20 years (An et al., 2021). Boniol et al (2012) provided an overall estimate of relative risk of 1.25 [1.09, 1.43], and a value of 1.59 [1.36, 1.85] for first use of sunbeds before 35 years of age.

2.3 A meta-analysis of 19 studies with 10,406 cases of keratinocyte cancer among people who reported ever using sunbeds compared with those who never used indoor tanning found that the relative risk for SCC was 1.58 [1.38, 1.81] and that for BCC was 1.24 [1.00, 1.55] (An et al., 2021). Use in early life (<20 years of age) was more strongly associated for both SCC (relative risk 1.89 [0.90, 3.98] and BCC (1.86 [1.44, 2.41]).

2.4 The 13th COMARE Report referred to an estimate by Diffey (2003) of mortality in the UK from melanoma attributable to sunbed use of around 100 deaths annually (range from 50 to 200). A later analysis in 2012 gave essentially the same number for deaths in the UK, within a wider estimate of around 800 deaths annually in 18 western European countries (Boniol et al., 2012). The associated estimate of melanoma cases in these 18 countries was around 3,400 annually, with two-thirds of cases in women. These estimates relate to recorded total melanoma cases of around 60,000, and therefore the proportion attributable to sunbeds was about 5 to 6% (Boniol et al., 2012).

2.5 The incidence of skin cancer caused by UV radiation has risen dramatically among light-skinned populations in recent decades (WHO, 2017). Chen and Wang (2025) showed that melanoma incidence in the UK increased by 137% between 1990 and 2021, with a smaller increase in mortality over this period of 20%. However, it appears that the year 2015 marked a turning point from a continuous increase in incidence and mortality to decreasing trends with a fall of about 2% per year for both incidence and mortality (Chen & Wang, 2025). Similar observations of more recent

[4] In this report, figures in square brackets are 95% confidence intervals. Thus, in this case, 1.27 is the mean value, and lower and upper confidence intervals on this mean value are 1.16 and 1.39.

declines in melanoma rates have been reported for Australia (Whiteman et al., 2024).

2.6 The reasons for falling melanoma rates are likely to be complex with a number of possible contributory factors. There have been changes to disease classification, with some melanomas recorded as melanocytomas which may then not have been appropriately included. Changing behaviours with less time spent outdoors is also a likely factor, as are possible contributions made by increasing population diversity (Chen & Wang, 2025). Also, public health policies to reduce UV radiation exposures are likely to have been an important factor. To address the ever-rising incidence of skin cancer, public health campaigns, such as *Sun Know How*, were introduced in the UK to raise awareness of the adverse health impacts of excessive UV radiation exposure (Eagle et al., 2011). It is noted that the National Institute for Health Care and Excellence (NICE) implemented updated guidelines for skin cancer recognition and referral in 2015 (NICE, 2015). The contribution made by the limitation of sunbed use by young people under 18 years of age and other controls is unknown.

2.7 The most recent figures for melanoma incidence from Cancer Research UK (CRUK 2026) show a small upturn in the period 2020-2022 compared with 2019-2021, due largely to a rise in incidence for the older age groups (>70 years of age). One factor identified as a contributor to this recent upturn is that people tended not to seek medical advice during the COVID-19 pandemic, resulting in a later increase in recorded cases (Mostafavi Zadeh et al., 2025).

2.8 Individual variation in sensitivity to the effects of UV radiation from the sun and sunbeds is determined by a number of factors, particularly skin type and age at exposure. Within fair-skinned populations, those most susceptible to sunburn are at the greatest risk of melanoma. COMARE (2009) and the World Health Organisation (WHO, 2017) refer to a skin type scale from I to VI. The gradation begins with the most sensitive Type I with pale white skin, blond or red hair, blue or grey eyes, and frequent freckles, with inability to tan but readily suffer sunburn. In contrast, Type VI individuals have dark brown or black skin, black hair, and dark brown eyes, and they rarely burn. In addition, the presence of skin naevi (moles) is an important marker of melanoma risk, including from the use of sunbeds (Veierød et al., 2010). Boniol et al. (2012) commented that their estimate of numbers of melanoma cases arising from sunbed use (5 to 6% of total numbers) could be an underestimate because sunbed users are most likely to have fairer skin (phototype I/II).

2.9 Many commonly used drugs, including antihypertensives, antidepressants and antibiotics, can cause skin phototoxicity (Blakely et al., 2019; Kim et al., 2018), and there is some evidence for an associated skin cancer risk. In particular, the European Medicines Agency (EMA, 2018) and United States Food & Drug Administration (FDA, 2020) have introduced skin cancer risk labelling for hydrochlorothiazide. Recent systematic reviews and meta-analyses support a link between hydrochlorothiazide, thiazides, other classes of anti-hypertensives and skin cancer (Cohen et al., 2024; Heisel et al., 2023), while study design issues leave uncertainties regarding skin cancer risk attributable to photosensitising drugs.

# Chapter 3. Sunbeds and other health effects

3.1 While increased risk of skin cancer is the most important adverse effect of exposure to UV radiation, there are a number of other effects that apply to exposures from sunbeds as well as exposure to the sun, including ageing of the skin, damage to the eyes, and suppression of the immune system. There is weaker evidence linking solar UV exposure with other cancers, including acute lymphoblastic leukaemia, non-Hodgkin's lymphoma and certain types of brain cancer (COMARE, 2009; Coste et al., 2017; Little et al., 2025; Little et al., 2024; WHO, 2017).

3.2 Chronic or excessive exposure to UV radiation causes accelerated photo-ageing of the skin, characterised by a leathery, wrinkled appearance and loss of elasticity (COMARE, 2009; WHO, 2017). The 13th COMARE Report referred to evidence in humans that damage to mitochondrial DNA in elderly skin is related more to photodamage than to chronological age and that recent sunbed use by volunteers showed similar damage. The WHO (2017) summary of adverse effects includes phototoxic and photoallergic reactions to UV radiation and skin disorders resulting from effects of UV radiation on the immune system, including certain photdermatoses and reactivation of herpes.

3.3 Damage to the eyes from UV radiation can include accelerated formation of some cataracts, ocular surface neoplasia, ocular melanoma, and eye irritation, including photokeratitis and conjunctivitis (COMARE, 2009; Lucas et al., 2019; WHO, 2017). The contribution of UV radiation to cataract formation is mainly attributable to UV-B radiation, generally a small proportion of emissions from sunbeds. However, WHO (2017) conclude that chronic low dose exposures to UV-B at levels emitted by sunbeds can lead to premature cataract. UV-A, the primary emissions from sunbeds, can reach the retina and result in direct retinal phototoxicity.

3.4 UV-A and UV-B have been shown to negatively affect immune reactions in the skin and other organs, with observed dose-dependence, so that reactions to viral infections may be suppressed and response to vaccination affected (Durao et al., 2025; IARC, 2012; WHO, 2017).

3.5 Studies of frequent users of sunbeds have concluded that tanning is to some extent addictive for a sub-group of individuals who exhibit addictive tendencies more generally (Mosher & Danoff-Burg, 2010; Reed, 2015; WHO, 2017). In addition, these studies suggested an association between more frequent sunbed use and symptoms of anxiety and depression.

3.6 Liu et al. (2014) presented evidence that UV-A exposures may have the beneficial effect of decreasing blood pressure, possibly due to the release of nitric oxide (NO) stored in the skin. Commenting on these observations, Halliday and Byrne (2014) referred to the deleterious effects of UV-A, including genetic damage, carcinogenesis and immune suppression, and concluded that the study of Liu et al. (2014) had raised questions that would require additional research.

3.7 A recognised benefit of exposure to UV radiation from the sun is the cutaneous synthesis of vitamin $D_3$, the precursor of a hormone that is essential for the absorption of ingested calcium (COMARE, 2009; WHO, 2017). Vitamin $D_3$ can also be obtained from dietary sources, including from oily fish, and the less potent form, vitamin $D_2$, from dietary plant materials. However, dietary contributions are rarely sufficient to meet physiological needs and synthesis in the skin is an important source (Hakim et al., 2016). There is good evidence that suboptimal levels of vitamin D are common (Hakim et al., 2016; WHO, 2017). Promotion of the use of sunbeds has included vitamin D synthesis among claimed benefits. However, the use of sunbeds to induce vitamin D synthesis is dependent on UV-B emissions, which are generally low. Studies indicate that increased levels of vitamin D plateau after a few sunbed sessions, with little if any subsequent contribution (COMARE, 2009). The consensus view of scientific organisations and reviews has been that sunbed use to promote vitamin D synthesis cannot be recommended because the benefit is outweighed by the established adverse effects (Laughter et al., 2021; Pierret et al., 2019; SCHEER, 2016).

3.8 There are perceived psychological benefits associated with sunbed use. Apart from the commonly cited reason of acquiring a pre-holiday tan, the most popular reason for using sunbeds appears to be improving appearance with perceptions of 'looking healthy' or 'looking better', with other perceived benefits including reduction of stress and improved relaxation. Protection from the sun afforded by a pre-tan is small and outweighed by adverse effects, including erythema, dryness and pruritus. Eden et al. (2023) concluded that the primary motivation of sunbed use was the endeavour to improve appearance but also perceived psychological benefits (well-being, confidence and "fitting-in") and specific physical benefits (preventing sunburn and increasing vitamin D levels). The continuing prevalence of such perceptions shows that there is more that can be done on public health messaging to explain that the probability of adverse effects outweighs any possible benefit. Cancer Research UK advise that those wanting a tan will be safer using a fake or spray tan but emphasise that having a fake or natural tan does not protect skin from UV radiation[5].

[5] Cancer Research UK – Tanning, fake tan and Melanotan

# Chapter 4. Prevalence of sunbed use

4.1 The 13th COMARE Report stated that around a quarter of adults in the UK have used a sunbed (COMARE, 2009). Two international surveys on prevalence of sunbed use published in recent years found that the number of people using sunbeds has decreased and this is consistent with results from recent surveys in the UK, although other data and the numbers of tanning salons suggest that there have not been large changes over the years. In addition, there are suggestions that a growing number of young people in the UK may be using sunbeds.

4.2 In a global survey by Rodriguez-Acevedo et al. (2020), 43 studies were identified that reported 'ever' or 'past year' indoor tanning exposure after 2009. Global prevalence of sunbed usage in adolescents for 2013 to 2018 was estimated as 6.5% [3.3, 10.6], compared with an estimate of 22.0% [17.2, 26.8] for 2007 to 2012. Among adults, the corresponding values were 10.4% [5.7, 16.3] for 2013 to 2018, compared with 18.2% for 2007 to 2012. Since 2009, the overall past-year prevalence was estimated as 6.7% [4.4, 9.6] among adolescents and 12.5% [9.5, 15.6] among adults. The prevalence of tanning indoors in the past year was similar in North America and Europe.

4.3 Suppa et al. (2019) surveyed 227,888 individuals from 30 European countries, excluding the UK, who were screened during the *Euromelanoma* campaigns of 2009 to 2014. Overall, the prevalence of sunbed ever use was 10.6%, with greatest use by the 20 to 35 year group (5.9% for ≤19 year-olds, 17.0% for 20 to 35 year-olds, 8.3% for >35 year-olds), with females recording greater use than males in all countries.

4.4 Despite these two peer-reviewed surveys indicating a fall in the number of people using sunbeds, media reports in the UK suggest a growing number of young people are using sunbeds, as many operators subtly rebrand sunbed tanning as part of a luxury wellness or beauty regime[6]. Tanning salons are using marketing terms such as "Vitamin D therapy" and suggesting that sunbeds promote relaxation, reduce stress and increase resistance to infection and viral diseases, with no supporting evidence[7]. The popularity of sunbeds among young people is thought to be, in part, the result of social media (Perkins, 2025). A recent report by Stevenson et al. (2024) suggesting that sunbed use is associated with lower all-cause mortality has been picked up by social media despite substantial concerns that this ecological study, in which there is potential confounding, cannot reliably associate exposures and health outcomes (Diffey, 2026).

4.5 A 2024 survey by the charity Melanoma Focus of sunbed use in the UK reported that 28% of adults between 18 and 65 years of age and 38% between 18 and 35 years of age say that they currently use sunbeds, with 74% saying that they use sunbeds at least once per month and 53% using them at least once per week (Melanoma_Focus, 2024). The average use was reported as 72 occasions per year. However, these estimates appear questionably high when compared with the results

[6] Sunbed use on the rise as salons sell 'wellness' benefits. The Times, 25 March 2025
[7] Sunbed ads spreading harmful misinformation to young people. BBC News, 11 February 2026

from international and European surveys discussed above (paragraphs 4.2 and 4.3) and national surveys in the UK (see paragraph 4.6). In addition, such levels of sunbed use would imply that all sunbeds in the UK would be in heavy demand throughout the year, leading to expansion of provision, for which there is no evidence (see below).

4.6 A survey carried out in Northern Ireland in 2021/2022[8] reported that 2% of respondents were currently using sunbeds, with a higher proportion of females (3%) than males (1%); similar results had been obtained in previous years. Two-thirds of respondents said that they had never used a sunbed and would never want to, with more males (79%) than females (57%) saying this. The Wales Omnibus Survey in 2017 reported that 22% of adults have ever used sunbeds[9]. Around two-thirds of respondents who had used a sunbed said that they had done so once per year or less, while 13% said that they used a sunbed at least once per week. More recently in 2024, a Scottish survey showed that 24% of adults have ever used a sunbed at some time but currently 5% of adults are using them one or more times per year[10].

4.7 An Ipsos online survey of 4,200 members of the adult UK population carried out in 2025 on behalf of Cancer Research UK (Ipsos, 2025) found that 9% of respondents said they currently use sunbeds regularly or occasionally. A further 19% have used them in the past but do not anymore and around 7 in 10 (69%) have never used sunbeds.

4.8 Overall, it appears that current usage in the UK by adults and young people may not be very different from that 30 years ago when a survey in the UK commissioned by the Department of Health (Bulman, 1995) found that 9% of respondents had used sunbeds, with 24% of respondents aged between 16-24 having used a sunbed during 1994.

4.9 In October 2025, SmartScrapers[11] reported 5,300 tanning salons in the UK. Of these salons, 83% are single owner operations with 17% being part of larger brands. The recorded number of tanning salons were 4,356 in England, 240 in Wales, 479 in Scotland and 225 in Northern Ireland. These numbers are similar to those obtained in a survey reported in 2009 by the South West Public Health Observatory and presented in the 13th COMARE Report. Northern Ireland keeps data on numbers of sunbed premises, recording 291 outlets in 2023 and 2024 (see appendix B).

4.10 The 13th COMARE Report reviewed a study by the Southwest Public Health Observatory which established a strong association between the number of sunbed outlets and the level of area deprivation, with an approximate doubling of number of sunbed outlets in the most deprived quintiles compared with the most affluent ones (COMARE, 2009). Similarly, Kreft et al. (2025) found that numbers of commercial sunbed outlets per 100,000 population in England and Wales increase with increasing deprivation.

[8] Health survey Northern Ireland: first results 2021/22
[9] Survey of sunbed use in Wales: Summary briefing
[10] Public attitudes to cost of living and other topics: tracker – July 2024 data tables (www.gov.scot)
[11] List of Tanning salons in United Kingdom – this is a web-scraping service that should identify all salons with an internet presence

# Chapter 5. Implementation of the 13th Report recommendations

5.1 Current UK legislation controlling the use of sunbeds in commercial settings is as follows:

- Public Health etc. (Scotland) Act 2008
- Public Health etc (Scotland) Act 2008 (sunbeds) Regulations 2009
- Sunbeds (Regulation) Act 2010
- Sunbeds (Regulation) Act 2010 (Wales) Regulations 2011
- Sunbeds Act (Northern Ireland) 2011

5.2 Table 5.1 provides a summary of the recommendations made by COMARE in its 13th report (COMARE, 2009) regarding the control of sunbed use, showing whether the legislation in each nation addressed each of the recommendations. Although legislation in the four nations is consistent with regard to the ban on use of sunbeds at ages less than 18 years, there are differences in requirements relating to other controls, including supervision, provision of health information, and requirement for protective eyewear. Notably, requirements placed on operators of commercial sunbed outlets in Wales, Scotland and Northern Ireland include supervision of sunbed use and provision of written health information. In England, the Sunbeds (Regulations) Act 2010 includes the power to implement each of these measures but there have been no follow-up regulations to do so.

5.3 Legislation in Wales and Northern Ireland requires that operators make available protective eyewear. While the Sunbeds (Regulations) Act 2010 makes provision for this as an option for future legislation, it has not been followed up in England. There is no mention of protective eyewear in Scottish legislation. While the COMARE recommendation was for compulsory use of eye protection, legislation refers reasonably to ensuring use “as far as is practicable”. Similarly, the COMARE recommendation that sunbed outlets should not display information claiming health benefits is implemented in legislation in Wales and Northern Ireland, not mentioned in Scotland, and an option for further regulation in England.

**Table 5.1: Summary of the implementation of the 13th COMARE Report (2009) Recommendations in the UK**

| 13th COMARE Report Recommendations (2009) | Implemented in legislation? | | | |
|---|---|---|---|---|
| | England | Wales | Scotland | N Ireland |
| Commercial use by persons under 18 years of age should by prohibited | Yes | Yes | Yes | Yes |
| Sale to or hire by persons under 18 years of age should be prohibited | No | Yes | Yes | Yes |
| Unsupervised use and/ or self-determined operation in commercial outlets should be prohibited | No | Yes | Yes | Yes |
| Commercial outlets should be licensed and registered, including the types and power of machines on the premises | No | No | No[12] | No |
| Commercial outlets should provide protective eyewear and its use should be compulsory | No | Yes | No | Yes |
| Written information on the health risks should be provided to users. Use of sunbeds by persons in at-risk groups should be discouraged | No | Yes | Yes | Yes |
| Informed consent should be obtained from the clients prior to use | No | No | No | No |
| The promotion of unproven health benefits should be prohibited | No | Yes | No | Yes |
| Sunbeds should adhere to relevant standards, and in particular should not exceed irradiance of 0.3 W $m^{-2}$ | No | No | No | No |
| Local authorities should have a duty to inspect commercial outlets. | Yes | Yes | Yes[13] | Yes |
| Operator training should be required and competence determined | No | No | No | No |

5.4 Recommendations made by COMARE that were not implemented in these sunbed Acts are that there should be controls on types of sunbeds used and their output irradiance; operators should be trained and demonstrate competence; clients should provide informed consent; and outlets should be licenced and registered. The Northern Ireland Act provides powers to prescribe in regulations, for requirements in

[12] Some local authorities in Scotland require a sunbed salon to have a public entertainment licence to operate; review suggests that this applies to around 40% of local authorities.
[13] Only when acting on complaints or information received on non-compliance with regulations.

relation to sunbeds, training and licencing and registration; however, these powers have not yet been commenced.

5.5 It is not clear how government reached decisions on which recommendations to implement in legislation, or why different decisions were made in the four nations. Information on compliance in each nation would also be valuable. In this respect, the experience in Northern Ireland is noteworthy. As explained in appendix B, District Councils in Northern Ireland collaborate through a Sunbeds Working Group to oversee and enforce sunbeds legislation.

5.6 In addition to the legislation discussed above, sunbeds should comply with BS EN 6033 5-2-27 which is the British and European Standard specifying safety requirements for electrical appliances that emit UV or infrared radiation. Such standards are primarily intended to ensure the safe manufacture and operation of equipment (for example in relation to electrical and mechanical safety). BS EN 6033 5-2-27 requires that emissions from sunbeds should not exceed an erythemal-effective irradiance of 0.3 W $m^{-2}$. However, it is common for tanning units to exceed this limit (Khazova et al., 2015; Kreft et al., 2025; Tierney et al., 2013). For example, an inspection by South Tyneside Council's Trading Standards service found that about half of sunbeds tested (9/16) exceeded the limit.

5.7 Exposure at 0.3 W $m^{-2}$ for 10 minutes is equivalent to 180 J $m^{-2}$, which is around the lower limit of the minimal erythema dose for unacclimatised white skin (SCCP, 2006). It was noted that this irradiance is equivalent to tropical sun at mid-day, giving examples of Darwin, Australia (13°S) and Colombo, Sri Lanka (13°N). A high irradiance in itself is not the issue, rather it is dose, which is the product of irradiance and exposure time. Studies of UV-induced skin cancer in mice have shown that for a fixed dose of UV radiation, carcinogenic effectiveness increases as the irradiance decreases (SCCP, 2006), suggesting that using a sunbed with a high irradiance for a short exposure time may be less carcinogenic than using a sunbed with low irradiance for a longer exposure time.

# Chapter 6. WHO policy options

6.1 WHO (2017) reviewed policy options for the control of sunbed use, including a range of interventions that had been implemented in at least one country or member state. In introducing the various options, the overall guidance given by WHO was that the selection of approaches should consider the particularities of the population, including current levels of other risks that are accepted and political and societal acceptance of restrictions, the costs and feasibility of implementation, and the likelihood of success. Appropriate approaches can be expected to differ between countries.

6.2 Comparison of the policy options considered by WHO and the recommendations of the 13th COMARE Report showed that the COMARE recommendations included all but three possible interventions:

- Taxation of sunbed services
- Ban on marketing and promotion of sunbeds
- Complete ban of all sunbed services.

6.3 Taxation of products (e.g. alcohol, tobacco) and services is a legitimate approach to discourage activities that may be injurious to health. The taxation of sunbed services is not common, but the United States Internal Revenue Service introduced a 10% excise tax on indoor tanning services in 2010. In a subsequent study of tanning salons in Illinois, 26% reported a decline in customer numbers, although it was not clear that the tax was the only reason, and 78% of responding salons said their clients did not seem concerned about the tax (Jain et al., 2012). The WHO report concluded that taxing sunbed use alone may not be sufficient without other measures to reduce sunbed use (WHO, 2017).

6.4 In some countries, sunbed operators are prohibited from advertising non-cosmetic health benefits and from making unsubstantiated or misleading health claims (WHO, 2017). These restrictions are enforced under consumer-protection laws and, in some cases, medical-device or pharmaceutical regulations. Countries including Canada, Chile, Colombia, Slovenia and the United States have implemented controls to restrict sunbed operators from advertising non-cosmetic health benefits.

6.5 A further concern is that promotional offers may lead to excessive use. Ireland has introduced regulations banning certain marketing practices that encourage sunbed use, including free sessions, reduced prices and other types of promotion and advertising (WHO, 2017). However, a recent study on marketing practices by tanning salons in Ireland highlighted the use of social media promotions and incentives by sunbed operators (Purves & Morgan, 2025). In place of offering discounts on sunbed sessions, some media posts encouraged users to visit salons by offering limited-time promotions on products such as lotions. For instance, special offers on tanning products and pre-pay packages were promoted. Instagram was a major platform for sunbed marketing with the use of images of tanned models, sunny beach scenes, and phraseology such as '*Get your summer glow'*. Although health claims are banned in Ireland, some promotions still suggest benefits such as improving confidence or providing vitamin D.

6.6 In the UK, the Advertising Standards Authority (ASA) has upheld several complaints regarding the advertising of misleading health claims by sunbed operators[14]. SmartScrapers (October 2025)[15] data showed that tanning salons in the UK have digital/social media presence across various platforms such as LinkedIn, Facebook, Instagram, X, TikTok, and YouTube.

6.7 There are currently three countries that have banned all commercial use of sunbeds – Iran in 2008, Brazil in 2009 and Australia in 2015. In Australia, a buy-back scheme was implemented in some states to facilitate the removal of commercial sunbeds from circulation and reduce numbers being sold into the private market. These bans apply to commercial sunbeds; private/home use remains possible. A review of the Australian experience suggests that because sunbed operators were given sufficient notice of the ban, they were quick to reorientate their cosmetic services, including spray tanning, and because state governments ensured appropriate monitoring and enforcement, there were only a small number of breaches that declined over time (Gordon et al., 2020; Janda & Sinclair, 2022). WHO (2017) advised that if governments opt for a ban on commercial operation of sunbeds, public education and strong enforcement of the ban need to be part of the package of interventions. Consideration needs to be given to unintended consequences, including increased sale of domestic devices and use of unsupervised tanning services.

6.8 A recently published economic analysis of a policy-based intervention to reduce melanoma and other skin cancers associated with sunbed use in England concluded that a ban on commercial indoor tanning combined with a public information campaign would be cost-effective (Eden et al., 2022). The analysis considered the cohort of all 18 year-olds living in England in 2019 and estimated that a ban could result in 1,206 avoided cases of melanoma, 207 fewer melanoma deaths and 3,987 averted cases of keratinocyte cancers over the lifetime of this cohort, with a net monetary benefit of £10.6 million; benefits would recur for further cohorts. It has been estimated that a buy-back scheme would cost ~ £11 to 55 million in the UK (Gordon et al., 2021). Kreft et al. (2025) referred to the analysis by Eden et al. (2022) and expressed their support for an outright ban of commercial sunbeds alongside public education as the most cost-effective solution to reduce skin cancer, save lives, and ease the burden on the NHS.

6.9 WHO (2017) emphasised the importance of public health campaigns directed towards those most at risk, including younger age groups. The 13th COMARE report also recommended stronger publicity campaigns, directed towards children. Past public health campaigns in the UK have included Sun Know How in 1993, Sun Smart UK in 2003 and R UV UGLY? in 2011 (Diffey & Norridge, 2009; Miles et al., 2005; Oyebanjo & Bushell, 2014). In addition, information on the health risks of sunbed use is available from a variety of on-line sources, including the websites of the NHS, the British Association of Dermatologists, Melanoma UK, Skcin, MASScot and Cancer Research UK. The effectiveness of some of these campaigns has been evaluated. For instance, the SunSmart UK campaign increased awareness of health risks but did not significantly influence sunbed use (Oyebanjo & Bushell, 2014). To

[14] For example: G24-1248081, October 2024; A25-1286191, September 2025; A25-1306576, A25-1306585, A25-1306586, A25-1306587 and A25-1306588, January 2026
[15] List of tanning salons in United Kingdom

be effective, public awareness campaigns need to address the arguments advanced in favour of sunbed use and employ evidence-informed arguments to counter them (WHO, 2017).

# Chapter 7. Discussion and conclusions

7.1 The purpose of this report is to provide a short update to the 13th COMARE Report (COMARE, 2009), including an overview of more recent science. Information on the prevalence of sunbed use is discussed. The implementation of recommendations from the 13th COMARE Report into UK legislation by the four UK nations is compared, and further policy options discussed by WHO (2017) are considered.

7.2 While more recent scientific analyses have provided refined estimates of risks associated with sunbed use, the overall picture of health effects from UV radiation and the contribution made by sunbed use has not changed substantially since the publication of the 13th COMARE Report.

7.3 The main health effect of concern is skin cancer, particularly melanoma but also keratinocyte cancers, although UV radiation also has other adverse effects, including ageing of the skin, photosensitivity reactions, damage to the eyes, and suppression of the immune system. UV radiation from the sun is the predominant determinant of skin cancer risk and other damage to the skin. In a study of the combined population of eighteen Western European countries, Boniol et al. (2012) estimated that sunbed use accounted for 5 to 6% of melanoma cases. Wehner et al. (2014) obtained a slightly higher figure of 9% for the contribution of sunbed use to melanoma incidence in Europe.

7.4 The incidence of skin cancer caused by UV radiation has risen dramatically among light-skinned populations in recent decades (Chen & Wang, 2025). However, it appears that the incidence of melanoma among young people in England has stabilised (or levelled off) in recent decades, whereas it continues to increase substantially in older populations (Memon et al., 2021). The authors suggest that public health campaigns targeted at children/adolescents/parents may be favourably influencing melanoma incidence, although other factors may also be at play, as discussed earlier.

7.5 Individual variation in sensitivity to the effects of UV radiation from the sun and sunbeds is determined by a number of factors, particularly skin type and age at exposure. Within fair-skinned populations, those most susceptible to sunburn are at the greatest risk of melanoma.

7.6 A recognised benefit of UV exposure from the sun is the promotion of vitamin D synthesis in the skin. Promoters of sunbed use almost invariably cite the benefits of improved vitamin D levels alongside general health and well-being claims. However, all scientific assessments are clear and consistent in their conclusion that the risks of sunbed use far outweigh any benefits. In any case, vitamin D supplements are readily available. NHS advice is that everyone should consider taking a daily vitamin D supplement during the autumn and winter[16].

7.7 Estimates of the numbers of people using sunbeds in the UK are variable but generally suggest that there have not been large changes in their use by adults over the last three decades. Numbers of commercial sunbed outlets in the UK do not

[16] Vitamin D - NHS – accessed 27 February 2026

appear to have reduced appreciably since 2009. However, there are indications that a growing number of young people in the UK are using sunbeds, as many operators promote sunbed tanning as part of a luxury wellness or beauty regime. Kreft et al. (2025) reported that numbers of commercial sunbed outlets per 100,000 population in England and Wales increase with increasing deprivation.

7.8 The 13th COMARE Report made detailed recommendations for the control of sunbed use in the UK, which are reflected in legislation in the four nations. Although legislation is consistent in banning the use of sunbeds at ages less than 18 years, there are differences in requirements relating to other controls, including supervision, provision of health information, and requirement for protective eyewear. Supervision of access to sunbeds and provision of written health information are required in Wales, Scotland and Northern Ireland but not England. The provision of protective eyewear during sunbed use is required in Wales and Northern Ireland but not Scotland or England. The COMARE recommendation that sunbed outlets should not display information claiming health benefits is implemented in legislation in Wales and Northern Ireland but not Scotland or England.

7.9 Recommendations made by COMARE that have not been implemented in any UK legislation are that there should be controls on types of sunbeds used and their output irradiance, operators should be trained and demonstrate competence, clients should provide informed consent, and outlets should be licenced and registered.

7.10 The scientific basis for the recommendations made by COMARE in 2009 remains unchanged. An updated set of essentially the same recommendations are presented in the next chapter. It is not clear how government reached decisions on which recommendations to implement in legislation, or why different decisions were made in the four nations. In addition, the level of compliance with these restrictions remains largely unknown, although the regime of inspection and surveillance in Northern Ireland can be seen as an example of good practice (appendix B).

7.11 WHO (2017) reviewed policy options for the control of sunbed use, including a range of interventions that had been implemented in at least one country or member state. These options corresponded largely to those recommended by COMARE, but with the important additional possibility of a complete ban of all sunbed services.

7.12 The option of a complete ban on commercial use of sunbeds has become a topical issue, with recent calls for a UK ban. A cost-benefit analysis by Eden et al. (2022) indicated that a complete ban in England would be cost-effective. Kreft et al. (2025) referred to this analysis and expressed their support for an outright ban of commercial sunbeds alongside public education as the most cost-effective solution to reduce skin cancer, save lives, and ease the burden on the NHS. The Republic of Ireland has recently conducted a public consultation on options for the control of sunbed use and the Department of Health has recommended a complete ban on their commerical use[17].

7.13 It can be argued that an outright ban would be inconsistent with risk-informed health and safety decision making and regulation in the UK, discussed for example by the Health and Safety Executive (HSE, 2021), and the fact that other causes of ill-health are not banned for adults (e.g. alcohol, tobacco). If the protection and respect of

[17] 20260320_Sunbed_Working_Group_Report_March 2026.pdf

individual consumer choice are important in policy terms, then preferred approaches might focus on improved messaging on health detriments. Advances in the field of risk communication suggest that the focus should be on highlighting the wider effects of tanning in healthcare and educational settings. In this regard, an appearance-focussed approach in both females (Williams et al., 2013) and males (Owen et al., 2016) may well be more effective than one based on the risk of cancer in later life. In addition, guidance could be given on maximum usage, while noting that this does not imply a safe level of use. This approach would be analogous to current advice on the consumption of alcohol, for example, which has responded to changing views on the balance between individual choice and costs in terms of healthcare and society more generally. Such wider policy issues deserve careful consideration.

7.14 It is clear, however, that a complete ban may be considered a legitimate course of action. The British Association of Dermatologists and the British Photodermatology Group are currently calling for a complete ban on commercial sunbeds[18], concluding that existing regulations have proved inadequate in protecting public health and that a ban would be a cost-effective way of reducing skin cancer incidence, saving lives and reducing healthcare costs.

7.15 It is the responsibility of government to ensure that consumers are adequately informed and that appropriate safeguards exist to protect against health risks such as those posed by the use of sunbeds. WHO (2017) advised that if governments opt for a ban on commercial operation of sunbeds, public education and strong enforcement of the ban need to be part of the package of interventions.

7.16 In the development of policy, government will need to give consideration to the possibility of unintended consequences, including increased sale of domestic devices and use of unsupervised tanning services following a ban. Any such increase in unsupervised use would increase the likelihood of use by more vulnerable groups, including those under 18 years of age. This consequence could be reduced by banning the sale of domestic sunbeds and similar devices, as well as implementing a buy-back scheme.

7.17 WHO (2017) emphasised the importance of public health campaigns directed towards those most at risk, including younger age groups. The 13th COMARE Report also recommended stronger publicity campaigns, directed towards children. In the seventeen years since the 13th COMARE Report, there have been significant developments in the growth and use of social media and in our understanding of their impact. To be truly effective, public awareness campaigns need to make best use of that understanding when addressing the inducements used to promote sunbed use and employing more persuasive evidence-informed arguments to counter them.

[18] The British Photodermatology Group Position Statement on Sunbeds – January 2026

# Chapter 8. Recommendations

8.1 These recommendations are consistent with and update the recommendations of the 13th COMARE Report, referring to legislation enacted in the four nations of the UK. In considering these recommendations, government will wish to determine the priority to be given to different initiatives to improve health.

8.2 **Recommendation 1**. Further regulation of the commercial use of sunbeds should be considered, addressing inconsistencies between requirements in the four nations. The wording of the recommendations below follows but abbreviates that used in the 13th COMARE Report:

- Unsupervised use and/or self-determined operation in commercial outlets should be prohibited in England as in Wales, Scotland and Northern Ireland.
- Local authorities should pursue their duty to inspect commercial outlets.
- Commercial outlets should provide protective eyewear and its use should be strongly encouraged. Wales and Northern Ireland have legislation on this requirement, saying that use should be ensured “as far as reasonably practicable”. England and Scotland should consider introducing requirements for eye protection.
- Written information on health risks should be provided to users. Informed consent should be obtained prior to use. Use of sunbeds by persons in high-risk groups should be discouraged. Written information on health risks is currently required in Wales, Scotland and Northern Ireland but not England. Informed consent and the provision of advice to those most at risk is not mentioned in legislation.
- The promotion of unproven health benefits should be prohibited in England and Scotland, as it is in Wales and Northern Ireland.
- Commercial outlets should be licenced and registered, including registration of the types of and irradiance from the tanning devices on the premises.
- Sunbeds should adhere to appropriate standards, in particular that they should not exceed an erythemal-effective irradiance of 0.3 W $m^{-2}$.
- Operator training should be required, and competence determined.

8.3 **Recommendation 2**. Government will need also to consider a total ban on the commercial use of sunbeds, addressing the cost-effectiveness of tighter regulation or a ban. Some of the pros and cons are discussed in this report and, while a total ban is an available option, it is not clear that it should be the preferred course of action in the UK. Pursuing a ban would require careful planning, considering unintended consequences, associated public education and strong enforcement, as would also be the case for the controls considered under Recommendation 1.

8.4 **Recommendation 3**. Public information campaigns are an essential accompaniment to any initiatives to control sunbed use. To be effective, such campaigns need to address the arguments advanced in favour of sunbed use and employ evidence-informed arguments to counter them. An important example is the promotion of sunbed use to increase vitamin D levels despite good evidence that risks considerably outweigh benefits, short exposures to sunlight are sufficient, and dietary sources and supplements are readily available. Information should be designed specifically for those most likely to use sunbeds and those most at risk, principally the young and fair-skinned. An appearance-focused approach could be more effective than one emphasising risk of skin cancer later in life. It is recommended that funding is provided for public information campaigns and for the monitoring of their effectiveness. Campaigns should be cognisant of development in risk communication and the use of social media.

8.5 **Recommendation 4**. The following research priorities have been identified to better understand requirements for control of sunbed use:

- Skin type is an important determinant of risks of skin cancer and skin damage from UV radiation more generally. To fully evaluate risks within UK populations and to help design appropriate health advice, better estimates of risk by age, sex and skin type would be valuable, as would information on whether sunbed associated melanoma has distinguishable pathogenesis. The role of medication with phototoxic potential and associated skin cancer risk is also an area requiring more research.
- Better information is required on sunbed use within the UK, to include frequency of use and the age and sex of commercial clients and those using sunbeds at home. Surveys could also address motivation and awareness of health advice and attitudes to exposure to the sun, considering the effect of social influencers and other sources of information. Results from such studies are required to inform effective public awareness campaigns.
- As a precursor to any changes in legislation, it will be helpful to understand the effectiveness of current legislation in the four UK nations, noting the differences in requirements between nations, and the established regime of inspection in Northern Ireland.

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# Appendix A. Abbreviations and glossary

| Acronym | Meaning |
|---|---|
| **ASA** | Advertising Standards Authority |
| **BCC** | Basal cell carcinoma |
| **COMARE** | Committee on Medical Aspects of Radiation in the Environment |
| **CT** | Computed tomography |
| **DHSC** | Department for Health and Social Care |
| **DNA** | Deoxyribonucleic acid |
| **EMA** | European Medicines Agency |
| **FDA** | Food and Drug Administration |
| **HSE** | Health and Safety Executive |
| **IARC** | International Agency for Research on Cancer |
| **NI** | Northern Ireland |
| **NICE** | National Institute for Health Care and Excellence |
| **NMSCs** | Non-Melanoma Skin Cancers |
| **NO** | Nitric oxide |
| **SCC** | Squamous cell carcinoma |
| **UKHSA** | UK Health Security Agency |
| **UV** | Ultraviolet |
| **WHO** | World Health Organisation |

**Adolescents** Individuals between the ages of a child and an adult.

**Basal cell carcinoma** The most common non-melanoma skin cancer, originating from basal cells, usually occurs as a pearly nodule or plaque with central depression. It begins in the lowest layer of the epidermis, called the basal cell layer. It usually develops on sun-exposed areas, especially the head and neck, but may also be common on the trunk. Basal cell carcinomas are slow-growing and hardly ever spread to other parts of the body. They are almost always curable but can cause significant morbidity.

**Carcinogen** A substance or agent that is capable of causing cancer in living tissue.

**Cataract** An opacity, partial or complete, on the lens of the eye which may impair vision and if dense enough, can cause blindness.

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| **Cohort** | A group of people who share a characteristic, such as age. |
| **Cutaneous** | Of the skin. |
| **DNA** | A chemical made up of a linear sequence of different molecules called bases (Adenine, Thymine, Cytosine and Guanine) constituting the genetic material of organisms. There are four bases and the permuted sequence of these is read as a code which determines the composition and properties of the organism. The simplest organisms such as bacteria have nearly five million bases in their genetic material; humans have more than three-hundred million bases. |
| **Epidermis** | The epidermis is the outermost of the three main layers that constitute the skin, the inner layers being the dermis ands hypodermis. The epidermis is composed of multiple layers of flattened cells that overlie a basal layer. The main cell type is keratinocytes, formed continuously from stem cells in the basal layer. Other cells present include melanocytes, Langerhans cells and Merkel cells. |
| **Erythema** | A redness of the skin. |
| **Immunosuppression** | The reduction of the activation or efficacy of the immune system, leading to a weakened ability to fight infections and diseases. |
| **Irradiance** | UV radiant power received by a surface per unit area, usually expressed in watts per square metre (W/m2 ) |
| **Keratinocytes** | The major cell type of the epidermis and constitute approximately 90% of epidermal cells. |
| **Malignant** | Synonymous with Cancerous. Malignant neoplasms or tumours can invade and destroy other tissues and spread to other parts of the body via the bloodstream or lymphatics (metastasis). |
| **Median** | The middle value in a distribution. |
| **Melanoma** | A tumour that arises in the melanocyte system of the skin and other organs (the cells that produce pigment) and that may spread rapidly to other parts of the body if not diagnosed and treated early. A melanoma may begin as a mole. Melanomas are the most dangerous type of skin cancer and the main cause of death from skin cancer. |
| **Meta-analysis** | A statistical method that combines the results of several studies addressing a set of related research hypotheses, to achieve a more accurate data analysis. It is widely used in epidemiology studies. |
| **Non-Melanoma Skin Cancers (NMSCs)** | A malignant growth of the external surface or epithelial layer of the skin and most often originates from the external skin |

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| | surface as a squamous cell carcinoma or a basal cell carcinoma. It is the most common cancer in the UK. The term keratinocyte cancers is similar to NMSCs but refers only to squamous cell carcinoma and basal cell carinoma and does not include rarer forms of skin cancer. |
| **Photosensitivity** | Adverse cutaneous reactions to UV radiation or visible light. These can occur when a certain chemical or drug is applied topically or taken systemically while a person is exposed to UVR or visible light. They also occur when the person has an underlying skin condition that is caused or worsened by UV radaition or visible light exposure; these are known as photodermatoses and photoaggravated skin conditions. |
| **Phototypes** | A classification (I-VI) based on the amount of melanin in the skin and its reaction to UV exposure (tanning vs. burning). |
| **Quintile** | Any of five equal groups into which a population can be divided according to the distribution of values of a particular variable. |
| **Squamous cell carcinoma (SCC)** | Malignant tumour derived from squamous cells, which are constituents of the skin and line the upper aerodigestive tract. Other organ cavities can develop squamous epithelium as a precursor to malignant change. Skin squamous carcinomas frequently appear as a firm red nodule, or rough warty growth, and can ulcerate. They are much more likely to spread and metastasize than basal cell carcinomas. The majority can be cured, but where spread has taken place this is much more difficult and the tumours can on occasion prove ultimately to be lethal. |
| **Sunbed** | An electrically powered appliance or installation intended to produce tanning of the human skin by utilizing UV radiation. |
| **Sunbed operator** | A person or corporation having ultimate control and management of one or more sunbeds in a commercial establishment. |
| **Sunburn** | Reddening, inflammation, and, in severe cases, blistering and peeling of the skin caused by overexposure to the UV radiation from the sun or from artificial sources. |
| **Ultraviolet (UV) Radiation** | Electromagnetic radiation in the wavelength 100-400 nm. |
| **UV-A radiation** | UV radiation in the long-wavelength wavelength range 315-400 nm. Not significantly filtered by the atmosphere. Approximately 97% of UV radiation that reaches the Earth's surface. |
| **UV-B radiation** | UV radiation in the medium wavelength range 280-315 nm. Approximately 3% of UV radiation that reaches the Earth's surface. |

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| **UV-C radiation** | UV radiation in the short wavelength range 100-280 nm. All solar UV-C radiation is absorbed by the ozone layer. |
| **UV radiation dose** | The amount of UV radiation to which a person is exposed. The UV radiation dose depends on the intensity of UV radiation and exposure time. UV radiation dose is expressed in joules $m^{-2}$. In general, the greater the dose, the greater the likelihood of an effect. |
| **Vitamin D** | Helps to form and maintain strong bones. It is found in food – in particular in fish, milk, and dairy products – and can also be made by the body after skin exposure to UV radiation. A deficiency of vitamin D leads to decalcified bones and the development of rickets in children and osteomalacia in adolescents and adults. Sub-optimal vitamin D levels can also result in bone fragility in the elderly and have also been associated with increased cardiovascular risk, muscle weakness and an increased risk of some cancers and auto-immune disease. |

# Appendix B. District council enforcement of sunbed legislation in Northern Ireland

B.1 Since 1 May 2012, sunbed use in Northern Ireland has been regulated by the following legislation:

- Sunbeds Act (Northern Ireland) 2011
- The Sunbeds (Information)Regulations (Northern Ireland) 2012
- The Sunbeds (Fixed Penalty) (General) regulations (Northern Ireland) 2012
- The Sunbeds (Fixed Penalty) (Amount) Regulations (Northern Ireland) 2012

B.2 Guidance for use by owners of sunbed businesses, sunbeds health warning poster and an information leaflet for sunbed users has also been made available.

B.3 In Northern Ireland (NI), District Councils collaborate through a Sunbeds Task Group to oversee and enforce the sunbeds legislation in NI. The group comprises Environmental Health Officers from each district council and the group meet quarterly throughout the year to share information and intelligence and to plan any promotional campaigns.

B.4 Each Council in NI has committed to visit their sunbed premises once a year, either:

- to carry out an inspection
- to undertake a test purchase that will involve a minor (under 18 years old) attempting to book a sunbed session for themselves. (These are carried out every 2 years on all establishments)
- in response to any issues or complaints
- to provide educational material and guidance (some examples of resources produced in NI include a ‘No ID no Sale’ flyer and an example sunbed risk assessment template for new businesses)

B.5 Enforcement action will be taken where necessary using fixed penalty notices.

**Table B.1: Sunbed data for Northern Ireland[a]**

| | 2018 | 2019 | 2021 | 2023 | 2024 | 2025 |
|---|---|---|---|---|---|---|
| Total number of sunbed premises[b] | 367 | 368 | 334 | 291 | 291 | 293 |
| Total number of hire premises | | 8 | | 5 | 4 | 2 |
| Number of premises which have sunbeds only | | | 81 | 95 | 117 | 119 |
| Total number of Sunbeds | | | 895 | 1,012 | 1,063 | 1,233 |
| Number of Test Purchase exercises | 133 | 158 | | 104 | 134 | 126 |
| Number of fixed penalty notices served | 12 | 18 | | 28 | 18[c] | 21 |
| Number of planned inspections | | | | 170 | 180[d] | 229 |
| Number of visits following a complaint | | | | 5 | | 7 |

[a] Additional data has been recorded in more recent years. Some data missing during Covid pandemic.
[b] Figures for previous years are: 171 in 2009, 310 in 2016, 308 in 2017.
[c] FPN served - 16 for underage sales and 2 for advertising health claims.
[d] Common issues found:

- Lessons learnt following a death in a sunbed room from suspected overdose. Improvements needed in management and training of time spent in rooms, emergency release of doors and emergency procedures.
- Management and training re: controls to prevent sales to under 18s / training on skin type.
- Many salons do not have refusal logs – recommendation/advised.
- Many salons do not record details of all users – especially if a walk in.
- Lack of operating manuals available.

[Whilst not all issues are legal requirements, they demonstrate poor management]

# Appendix C. The Committee on Medical Aspects of Radiation in the Environment

C.1 The Committee on Medical Aspects of Radiation in the Environment (COMARE) was established in November 1985 in response to the final recommendation of the report of the Independent Advisory Group chaired by Sir Douglas Black (Black, 1984). COMARE's terms of reference are:

> "*to assess and advise government and the devolved administrations on the health effects of natural and human-made radiation and to assess the adequacy of the available data and the need for further research*"

C.2 In the course of providing advice to Government and the devolved authorities for forty years, COMARE has published twenty major reports and many other statements and documents. This is the 21st report; previous reports are listed below. Reports and statements, as well as other committee information, can be found on the website: *https://www.gov.uk/government/groups/committee-on-medical-aspects-of-radiation-in-the-environment-comare*.

C.3 Each major report is prepared by a subcommittee, prior to consideration and agreement by the full committee. Once agreed by the committee, the report is submitted to the four UK health departments for agreement to publish.

## COMARE reports

| | |
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| **Twentieth report** | Risks of cardiovascular disease from exposure to ionising radiation, UKHSA, Chilton, 2026 |
| **Nineteenth report** | Radiation doses in interventional radiology: issues for patients and staff within the UK, PHE, Chilton, August 2021 |
| **Eighteenth report** | Medical radiation dose issues associated with dual-energy X-ray absorptiometry (DXA) scans for sports performance assessments and other non-medical practices, PHE, Chilton, July 2019. |
| **Seventeenth report** | Further consideration of the incidence of cancers around the nuclear installations at Sellafield and Dounreay. PHE, Chilton, September 2016 |
| **Sixteenth report** | Patient radiation dose issues resulting from the use of CT in the UK. PHE, Chilton, August 2014 |
| **Fifteenth report** | Radium contamination in the area around Dalgety Bay. PHE, Chilton, May 2014 |
| **Fourteenth report** | Further consideration of the incidence of childhood leukaemia around nuclear power plants in Great Britain. HPA, Chilton, May 2011 |
| **Thirteenth report** | The health effects and risks arising from exposure to ultraviolet radiation from artificial tanning devices. HPA, Chilton, June 2009 |
| **Twelfth report** | The impact of personally initiated X-ray computed tomography scanning for the health assessment of asymptomatic individuals. HPA, Chilton, December 2007 |
| **Eleventh report** | The distribution of childhood leukaemia and other childhood cancer in Great Britain 1969–1993. HPA, Chilton, July 2006 |
| **Tenth report** | The incidence of childhood cancer around nuclear installations in Great Britain. HPA, Chilton, June 2005 |
| **Ninth report** | Advice to Government on the review of radiation risks from radioactive internal emitters carried out and published by the Committee Examining Radiation Risks of Internal Emitters (CERRIE). NRPB, Chilton, October 2004 |
| **Eighth report** | A review of pregnancy outcomes following preconceptional exposure to radiation. NRPB, Chilton, February 2004 |
| **Seventh report** | Parents occupationally exposed to radiation prior to the conception of their children. A review of the evidence concerning the incidence of cancer in their children. NRPB, Chilton, August 2002 |
| **COMARE and RWMAC* joint report** | Radioactive contamination at a property in Seascale, Cumbria. NRPB, Chilton, June 1999 |
| **Sixth report** | A reconsideration of the possible health implications of the radioactive particles found in the general environment around the Dounreay nuclear establishment in the light of the work undertaken since 1995 to locate their source. NRPB, Chilton, March 1999 |

* Radioactive Waste Management Advisory Committee.

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| **Fifth report** | The incidence of cancer and leukaemia in the area around the former Greenham Common Airbase. An investigation of a possible association with measured environmental radiation levels. NRPB, Chilton, March 1998 |
| **Fourth report** | The incidence of cancer and leukaemia in young people in the vicinity of the Sellafield site, West Cumbria: further studies and an update of the situation since the publication of the report of the Black Advisory Group in 1984. Department of Health, London, March 1996 |
| **COMARE and RWMAC* joint report** | Potential health effects and possible sources of radioactive particles found in the vicinity of the Dounreay nuclear establishment. HMSO, London, May 1995 |
| **Third report** | Report on the incidence of childhood cancer in the West Berkshire and North Hampshire area, in which are situated the Atomic Weapons Research Establishment, Aldermaston and the Royal Ordnance Factory, Burghfield. HMSO, London, June 1989 |
| **Second report** | Investigation of the possible increased incidence of leukaemia in young people near the Dounreay nuclear establishment, Caithness, Scotland. HMSO, London, June 1988 |
| **First report** | The implications of the new data on the releases from Sellafield in the 1950s for the conclusions of the Report on the Investigation of the Possible Increased Incidence of Cancer in West Cumbria. HMSO, London, July 1986 |

* Radioactive Waste Management Advisory Committee.

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**Assessors in attendance representing the following organisations**

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Department of Health and Social Care
Department of Health (Northern Ireland)
Environment Agency
Food Standards Agency
Food Standards Scotland
Health and Safety Executive
NHS Scotland
Nuclear Decommissioning Authority
Office for Nuclear Regulation
Public Health Scotland
Scottish Environment Protection Agency
Scottish Government
UK Health Security Agency
Welsh Government

## COMARE UV Sunbed Subcommittee membership

| | |
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| | Welsh Government |
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