

Contents

List of participants	v
List of abbreviations	vii
Preamble	ix
Executive summary	xi
Physical characteristics and sources of exposure to artificial UV radiation	1
Physical characteristics of UV radiation	1
Units and measurements of UV radiation	1
<i>Measurement of ambient solar UV radiation</i>	1
<i>Standard erythemal dose (SED) and minimal erythemal dose (MED)</i>	2
<i>UV index</i>	2
<i>Limit values</i>	2
Sources of natural and artificial UV radiation	2
<i>Solar radiation</i>	2
<i>Artificial UV radiation</i>	2
<i>Comparison of UV spectrum from sunlight and indoor tanning appliances</i>	5
European and international positions regarding artificial sources of UV radiation	5
<i>Standard for appliances designed specifically for tanning purposes</i>	5
<i>National and international scientific policies</i>	6
<i>Regulations</i>	6
Biological effects of exposure to UV radiation relevant to carcinogenesis	7
Biological lesions induced by UVA and UVB radiation	7
<i>DNA damage</i>	7
<i>Cell damage</i>	7
<i>UVA, UVB and human skin</i>	8
Differential effect of UVA and UVB on skin cancers	8
<i>Experimental systems</i>	8
<i>Relevance of experimental data to human skin cancers</i>	8
Changes in immune response	9
<i>Experimental systems</i>	9
<i>Studies in humans</i>	9
Effects of natural and artificial UV radiation on human skin	9
<i>Variety of skin types</i>	9
<i>Sunburn</i>	10
<i>Tan acquisition</i>	10
Prevalence of exposure to artificial UV radiation for tanning purposes	11
Prevalence of exposure by region/country	11
Time trends	11
Personal characteristics of adult users	13
<i>Sex</i>	13
<i>Age</i>	14

<i>Skin type</i>	14
<i>Other factors</i>	14
Personal characteristics of adolescent and children users	15
Studies of compliance to regulations and recommendations	15
<i>Compliance of operators</i>	15
<i>Compliance of customers</i>	18
Epidemiological data on exposure to artificial UV radiation for cosmetic purposes and skin cancers	20
Methodology for literature search	20
Melanoma	21
<i>Description of studies</i>	21
<i>Quantitative approach: meta-analysis</i>	25
<i>Discussion</i>	33
Basal cell and squamous cell carcinomas	38
<i>Description of studies</i>	38
<i>Meta-analysis</i>	40
<i>Quality of studies</i>	40
Other sources of exposure to artificial UV radiation	41
<i>Medical use</i>	41
<i>Lighting</i>	43
Effects of artificial UV radiation not relevant to skin carcinogenesis	44
Cutaneous diseases	44
<i>Skin ageing</i>	44
<i>Other skin diseases caused or exacerbated by exposure to UV radiation</i>	44
<i>Drug-induced photosensitivity</i>	45
Effects on the eyes	45
<i>Cataract</i>	45
<i>Intraocular melanoma</i>	46
UV exposure and vitamin D	46
<i>Vitamin D formation by photosynthesis</i>	46
<i>Dietary sources of vitamin D</i>	46
<i>Vitamin D and exposure to artificial UV radiation for tanning purposes</i>	48
<i>Vitamin D and xeroderma pigmentosum patients</i>	48
Summary and Conclusion	
Summary	49
Conclusion	50
References	51
Appendix: European and international positions regarding artificial sources of UV radiation ...	61
Establishment of a standard for appliances designed specifically for tanning purposes	61
National and international scientific policies	62
Regulations	63