The meeting started with a joint session with the 20th Meeting of the International Advisory Committee of the EMF Project.

**International standards for Non-Ionizing Radiation (NIR) Protection (Mirjana Moser)**

A core group was established to develop further the concept of international Standards for NIR. The Core Group includes Dr Jacques Abramowicz (World Federation of Ultrasound in Medicine and Biology), Dr Efthymios Karabetos (Head of the Non-Ionizing Radiation Office, Greek Atomic Energy Commission), Dipl-Ing Rüdiger Matthes (ICNIRP chair), Dr Mirjana Moser (Independent expert in radiation protection), Dr John O’Hagan (International Commission on Illumination), Dr Rick Tinker (Director Radiation Health Services, Australian Radiation Protection and Nuclear Safety Agency). The group met on 27-28 April 2015.

The development of “Basic Safety Standards” for NIR (BSS-NIR) is within the core functions of WHO, and there is sufficient motivation and rationale for developing them. The BSS for Ionising Radiation (BSS-IR), which have 10 fundamental safety principles and 52 basic safety requirements, will be used as a starting point for NIR. However, there were many challenges, including the diversity of exposures and health effects, missing data, development of limits, precautionary philosophies, and the rapid technology development. While development was feasible, this would take time (estimated 42 months to develop a third draft) and money (estimated US$2M).

The overall vision for BSS-NIR is that they will provide a coherent set of fundamental principles and basic requirements which cover all NIR (including ultrasound and infrasound), all exposure situations and populations (with defined exceptions), be based on scientific evidence (but allowing for uncertainties and lack of knowledge), take into account an analysis of risks, costs and benefits, and be useful to Member States.

A simple questionnaire was distributed to the IAC to obtain feedback on the proposal.

One participant expressed some reservations about simply adapting an existing IR document, due to the much wider diversity in NIR effects and types of exposure. This would make basic principles very general indeed, and little different to general expectations of occupational public and environmental health management. It would be more useful at the moment to simply focus on limits.

Mr Craig Sinclair (Cancer Council Victoria, Australia) agreed to chair the UV InterSun meeting.
Update on the INTERSUN programme activities (E. van Deventer)

Emilie van Deventer welcomed the participants to the meeting on ultraviolet radiation, and participants introduced themselves. She described the background to the InterSun programme, the partners and stakeholders and the activities to date.

Review of national UV risk management around the world

Primary and secondary prevention of skin cancer: A German experience (R. Greinert, EUROSKIN)

Dr Greinert described the nationwide skin cancer screening programme being undertaken in Germany. The benefits expected from this programme are not only reductions in morbidity and mortality and the associated cost savings, but also the opportunity to make people aware of primary and secondary prevention actions, and how to perform a self-examination. Potential drawbacks include false positives and negatives, and psychological stress due to over-diagnosis and over-treatment.

A pilot study in NW Germany appeared to be successful, so the programme has been extended to the whole country. Medical staff involved in the screening programme all received special training. There has been an extensive public information campaign about the screening programme. Potential savings are estimated to be €259M.

In response to questions, Dr Greinert noted that:
- Whether it is better to screen only high-risk populations, rather than the whole population, is still being evaluated.
- It is necessary to have medical insurance to participate as the programme is paid for by medical insurance companies.

UV and outdoor workers

Prevention of UV-induced skin cancer in outdoor workers (S. M. John, University of Osnabrück, Germany)

Dr John emphasised the increased incidence of skin cancers in outdoor workers, and the costs associated with their treatment, and how they are almost entirely preventable. Authorities have been slow to recognise solar UV as a cause of disease which must be considered, but this is starting to change. For example, the ILO now recognises diseases caused by optical radiation in a separate category, and different types of NMSC are being coded separately. There is a EU Horizon2020 COST Action on the prevention of occupational skin disease entitled "Development and Implementation of European Standards on Prevention of Occupational Skin Diseases (StanDerm)"(TD1206). However, much more work needs to be done.

One participant commented that obtaining compensation for occupationally induced skin cancers can be difficult in some countries as the evidence has to show a doubling of risk – current epidemiology does not show that. (This could be due to misclassification reducing the odds ratios – better studies are needed.)

Another participant asked about eye damage from solar UV – Dr John replied that this is not a major risk for all occupations. Workers are usually happy to wear sunglasses (whereas they
may not use UV protection on the rest of the body).

**Recent global activities on UV exposure assessment in outdoor workers** (M. Wittlich, Institut für Arbeitsschutz der Deutschen Gesetzlichen Unfallversicherung IFA, Germany)

Dr Wittlich discussed the factors which influence UV dose, some of which are predictable (latitude, altitude etc.) and others which are not (weather, body position etc.). The Genesis-UV measurement system has been designed to allow easy acquisition of UV exposure data. Each unit comes in a case with all the equipment needed, and the data is uploaded back to a database in Germany. The dosimeter (which is worn on the left upper arm) includes UV-A and UV-B sensors, can measure orientation, and logs data every second.

Data from 300 subjects in Germany shows a wide range of exposures. This helps identify occupations with the highest exposures. Units have also been deployed in several other countries, including Australia, Chile, the UK and Antarctica. Dr Wittlich invited meeting participants to contact him if they would like to join the project.

**Assessing UV exposure in outdoor workers through modelling and surveys** (D. Vernez, Institut universitaire romand de Santé au Travail, Switzerland)

Dr Vernez described a complementary means of exposure assessment, through computer modelling. Realistic human models allow exposures to be determined on all parts of the body surface, and can take into account different postures. The results have shown that chronic exposure is mostly due to diffuse radiation. The data from this work can be used to help target primary prevention messages, and also serve as an input to epidemiological studies.

One participant asked whether the data could be used to develop a good job-exposure matrix. Dr Vernez said that is one of the aims of this work, and that ranking exposures is perhaps more important than determining absolute exposure. One problem is that occupations are often poorly recorded.

A draft Fact Sheet on occupational exposures to UV has been developed but is currently considered to be too detailed. Improving information on occupational exposure should be considered when developing research agendas.

**UV and sunbeds**

**The EC Scientific opinion on “Biological effects of ultraviolet radiation relevant to health with particular reference to sunbeds for cosmetic purposes”** (L. Rushton, Imperial College London, on behalf of EC SCENIHR)

Current legislation on sunbeds tends to emphasise safety of equipment (e.g. through the use of manufacturing Standards) rather than health of users. Generally information provided to consumers on health effects is poor, labelling is poor, and it is common for maximum permitted exposures to be exceeded.

SCENIHR has a new mandate to update a previous report on sunbeds (by SCCP - in 2006) in the light of new evidence. This will cover both negative and positive effects. This work should be completed in 2016.

A second SCENIHR mandate covers the biological effects of UV-C relevant to health, especially
from UV-C lamps. UV-C is used in a wide range of applications (water treatment, air treatment, food industry), and there is increasing use of UV-C lamps in consumer products. There is evidence that people are being burned by UV-C lamps, and a range of concerns about the availability of the lamps and poor labelling.

**Update on sunbed legislation in New Zealand** (*M. Gledhill, Ministry of Health of New Zealand*)

Since 2012 staff from New Zealand public health units have visited sunbed operators twice a year to make them aware of operating measures which can reduce risks, and assess how well they are complying with those measures. (Compliance is not compulsory.) Since the visits started there have been improvements in the use of informed consent forms, display of warning notices and staff training, but other areas (refusing to allow under-18s and people with sensitive skin to use a sunbed) have got worse. The number of operators has steadily decreased.

An amendment to the Health Act to ban under-18s from using sunbeds is currently before parliament. Submissions on this amendment were almost all in favour, and many sought a complete ban on commercial sunbed operations.

**New regulations in France** (*J. Fite, French agency for Food, Environmental and Occupational Health Safety (ANSES]*)

Existing sunbed regulations in France limit the UV intensity, amount of UV-B, and ban under-18s. Beds must be correctly marked with the ID code, and there are requirements on warning information and labels. There should be a technical inspection every two years. Nevertheless, there is a need to strengthen these controls. This is driven by a number of factors, including:

- The increasing numbers of sunbeds (40,000 in 2011).
- The increasing numbers of people using them, especially under-18s.
- Evidence showing associations between sunbed use and melanoma.
- Poor compliance with existing regulations, with few penalties applied.
- False beliefs about safety of sunbed use.

The French Cancer Plan contained several measures to reduce exposures to artificial UV, and strengthening regulations is currently being discussed in Parliament. ANSES recommended banning commercial sunbed use and sale of sunbeds for cosmetic purposes, and that the issue should be brought to the attention of the European Commission (which has resulted in the current SCENIHR work).

**The Australian experience of a total ban** (*C. Sinclair, Cancer Council Victoria, Australia*)

The implementation of sunbed bans in Australia followed several years with decreasing numbers of sunbeds, and the industry was given two years notice of the ban. Some States offered payments for old sunbeds, and assistance with moving into other business areas (but this was only taken up by about 30% of operators). The bans include high penalties for non-compliance. There was little resistance from industry, which was already small.

The ban has been effective, and there has been no large increase in the market for domestic sunbeds, or on the second hand market.

**The WHO sunbed database** (*E. van Deventer*)
Emilie van Deventer outlined a plan to make information on sunbed legislation available on the WHO GHO website. Data must be provided by a government agency (not an NGO). If there is sub-national legislation, then ideally this will also be displayed. Data should include links to the underlying statutes and policy material.

UV index

Proposal for a modification of the UVI risk scale (C. Sinclair)
The current UV Index was developed in 2002 as a practical means to quantify ambient UV. It recommends graded actions as a function of the UV Index.

At previous Intersun meetings, a proposal to extend the UV Index has been discussed, as large portions of the globe experience UVI>11 in summer, and in some areas it can reach 24.

Two options are being considered. One continues with advice on a graded response as the UVI increases, although there is not clear scientific basis regarding specific thresholds to support this. The second option is simpler, suggesting no protection for a UVI below 3, and protective measures for all higher values. The reason for this is that the primary objective is to recommend protection – if the advice is followed then the protection (sunglasses, clothing, hat, sunscreen, etc.) is the same whatever the UVI. A challenge with the second option is that many countries have encouraged the graded response.

A number of comments were made in the following discussion:

- Any changes to recommendations would need to go through strict process at WHO. There must be an evidence base, consideration of end-user preferences, a balance of benefits and harm, and consideration of resource implications of interventions. For the graded approach, scientific evidence for the need for different interventions at different UVI levels would be required. Hence option 2 is easier in that respect.
- Perhaps the UVI could be simplified by removing the descriptors (low, moderate, high etc.) and simply have “low” and “not low”.
- The “burn time” approach was suggested, but it was noted that these differ depending on the population.
- In schools, a simple approach of always wearing a sunhat in summer, whatever the weather, is taken.
- The information booklet provides information to authorities to help them formulate sun protection messages. Hence any messages should be for those people.
- A purpose of the UVI is to sensitise the population to UV risks. There needs to be qualification of the amount of UV to give some awareness of relative risk.
- The current UVI uses numbers, colours, words and actions associated with UV levels. We could drop one of these (e.g. the descriptor) and still keep the others (e.g. colour).
- The biggest challenge would be to justify changes in intervention at, for example, UVI = 7. There is still a relatively artificial boundary between 2 and 3. It is probably easier to make an argument that 3 is good boundary, rather than argue for extra descriptors.
- It will be difficult to persuade people to take the same actions at UVI = 3 and UVI = 11. (But it was also noted that the current advice makes little difference except for the use of the word “avoid” exposure at high UV levels – and that is impractical.)
- What about other scales e.g. temperature and recommendations on how to dress
according to the temperature? We would like to get to the point that people make a choice depending on their own individual circumstances. Hence we should just give an impression that risk increases with UVI, and leave it up to institutions to make recommendations if they want to.

- After listening to this discussion, Option 2 seemed acceptable to several participants in order to make it simple. However, no consensus was reached.

Emilie van Deventer commented that the next steps would be to develop specific (PICO) questions, and perform some systematic reviews of the published to answer them. The evidence should be evaluated by an expert group. There is a UV and skin cancer workshop in Melbourne in December 2015 which will bring experts together, and the meeting will include a pre-conference workshop on the UVI.

Reports on UV activities from collaborating centres and international organizations

Cancer Council Victoria (CCV), Australia (C. Sinclair)
Australia has been re-examining the question of how much sun exposure is needed – this varies greatly across the country. As a result an updated joint recommendation by several Australian and New Zealand bodies has been prepared. In winter there will no longer be advice to actively seek exposure, but instead a recommendation (for areas where the winter UVI<3) that no sun protection is needed, and that people are encouraged to take outdoor exercise with some skin exposed. In the summer, sun protection is needed, but this is unlikely to make people Vitamin D deficient.

Association Sécurité Solaire, France (P Cesarini)
Pierre Cesarini provided an overview of the background and activities of the Association. The Association now has partnerships with agencies in many other regions and countries, including Belgium, Brazil, Quebec and Serbia. An English language version of the Association’s website is also available (www.livingwiththesun.info).

The Association is also forming partnerships to promote occupational protection, and is working with the French railway operator (SNCF), health insurance (Entrain), and the social security and health insurance of the French army. It is calling for a ban on sunbeds.

Laboratory for Atmospheric Physics, Bolivia (Francesco Zaratti)
The LFA research priority is climate change: there is very little interest in UV issues shown by government and regional authorities. Activities to promote UV awareness and protection undertaken by LFA include publication of a monthly bulletin (a recent item promoted beards for UV protection), media interviews, school talks, advice to and sharing expertise with other laboratories in the area and validating/analysing UV and ozone data.

Recent tests found that 60% of sunglasses being sold in urban fairs did not comply with EN1836:2005. Cataracts are a growing problem in Bolivia.

Skin cancer is also a big problem, but the annual reports from the national cancer registry are considerably late. There is regulation of sunbeds in Santa Cruz, but no information about enforcement. The LFA “hats for schools” initiative in Altiplano schools is not being supported by local authorities.
LFA supports modification of the UVI scale, and has contributed to a letter questioning the report of a UVI of 43 being measured in the Andes.

**Review of recent national or regional UV activities**

**The Montreal protocol and human health: the latest UNEP Environmental Effects Assessment Panel (EEAP) report (N. Paul, Lancaster University, UK) – remote participation**

Dr Paul gave an account of the history and results of the Montreal protocol of 1987 regulating the release of ozone depleting substances (ODS). Thanks to its successful implementation, in all but high latitudes UV increases due to ozone depletion are small and hard to detect against variations due to other factors. These small increases will decline over the coming years, although the lifetime of ODS can be decades. Had the Protocol not been successful, modelling shows that by 2050 the UVI would be >25 over most of the tropics, USA and Australia, and >25 over most of the world by 2090. There would be >45 million excess cases of cataracts, and 300 million excess cases of skin cancer, in the USA for cohort groups in birth years 1890 – 2100.

**The US Surgeon General’s Call to Action to prevent skin cancer (M. Watson, US Center for Disease Control, USA) – remote participation**

Skin cancer is a growing problem in the USA, and most could be avoided. 37% of Americans report getting sunburned annually, many four or more times per year. 1 in 3 non-Hispanic white women age 16-25 report using a sunbed. While 70% of people report using one or more sun-protection methods (shade, hat etc.), there is low uptake for each method individually.

The CDC was asked to take a lead in developing the Surgeon-General’s call to action to prevent skin cancer. This is a science-based document which provides clear action steps to make progress. Several other agencies (NIOSH, FDA, FTC, NCI …) and outside partners were also involved. The call to Action has five strategic goals, and specific strategies outlined to achieve these goals. These include, for example, sun safety education/policies in schools, and shade planning in land use development.

One participant asked whether the Call to action had resulted in any increased government funding, but to date it has not.

Another asked about taxes on indoor tanning. While there is a 10% tax on indoor tanning, this might not be enough to have much effect (for example, some operators offer unlimited tanning for $50 per month). However, 11 States have banned under-18s from commercial sunbeds, and most States have some legislation on indoor tanning.

**Way forward**

Emilie van Deventer asked the meeting participants whether these meetings should be formalised along the lines of the EMF IAC. One caution was that it may not be as easy to define who should attend, and the relevant people may not be the same as for EMF. A comment was made that it should be relatively easy to find the right people in Europe, especially with regard to occupational health.

The EMF Project has country pages on the Project website, and each country provides a yearly update on activities. Meeting participants thought that this would be a good idea for the UV
meetings, and the country pages could nominate contact people.

There was an EHC monograph on UV in 1979 and 1994, and Emilie van Deventer asked whether a further update should be prepared.

WHO collaborates well with the ILO on UV matters.

The question of a UV research agenda was raised, with a focus on public health. It was noted that the EMF research agendas were divided into several types of study, but for UV the work would probably look more at interventions (perhaps a parallel to the sociological studies in the EMF area). A research agenda received general support as a means to define the scientific needs. The work on the UV Index could also feed into this.

These matters will be considered by WHO, who will come back to participants with some more specific questions. In the meantime, it was noted that funding is always needed for this area of work.