South African Journal of Science

24 April 2012

To the Editor-in-Chief: Prof Cherry

**RE: Submission of manuscript titled ‘The impact of solar UV radiation on human health in sub-Saharan Africa’**

We have prepared a manuscript that describes the impact of solar ultraviolet (UV) radiation on human health in sub-Saharan Africa to be considered for publication in the South African Journal of Science. Sub-Saharan Africa was chosen as the area of interest because despite there being poor and limited data, some evidence of the impacts of solar UV radiation on human health in this region does exist. Notably, prevalence rates for melanoma skin cancer at the southern tip of Africa are among the highest in the world, comparable to those for Australia and New Zealand. In addition, there are relatively large numbers of individuals in the region with occulocutaneous albinism who suffer from sun-related illnesses and inadequate sun protection options. The authors live and carry out research in this region and are working collectively, together with others, to try to address these human health impacts. Sub-Saharan Africa is of particular interest since it spans the equator (tropical and sub-tropical zones) and has intense solar UV radiation levels throughout much of the year, thus increasing the risk of adverse health impacts among the multiethnic populations. The health situation in sub-Saharan Africa is considered poor, particularly when reviewing the current status of these countries and the likelihood of their reaching the health Millennium Development Goals by 2015. The adverse health impacts posed by excess solar UV radiation exposure exacerbate an already stressed health situation. When aspects of climate change are taken into consideration, these concerns become even graver.

We wish to highlight the research and information gaps and the opportunities for personal sun awareness to reduce the adverse consequences of solar UV radiation. For example, as mentioned in the manuscript, there is a network of solar UV monitoring stations in South Africa giving rise to the hope that this may be expanded to provide information daily on the local UV Index for the whole of sub-Saharan Africa. We give details of such facts and figures that are available for sub-Saharan Africa, in addition to providing background information for readers who might not be familiar with the diverse effects of solar UV radiation on human health. The article has a wide scope and we feel that it is unique in covering so many aspects of the subject, with embedded references which give more details where required by the reader. Furthermore, we included material of interest to policy makers, in addition to research scientists and medical doctors. In the final section of the manuscript, the following conclusions and recommendations were made (summarised here):

* For the World Health Organization INTERSUN programme to be effective in sub-Saharan Africa, fundamental research is needed on sun-related disease prevalence and incidence, exposure patterns (occupational, early life and recreational) and sun awareness, especially the lack thereof but also how this is affected by cultural beliefs and practices.
* There is a definite need to initiate and manage public health information to support research throughout the region.
* Research is required to better understand the possible consequences of climate change in sub-Saharan Africa.
* Ground-based monitoring of ambient solar UV radiation is limited and needs to be expanded.
* Research is needed on the potential interactions of solar UV radiation with local diseases, such as HIV/AIDS, malaria and tuberculosis, and especially with vaccine responses, since immunisation is a major public health initiative in sub-Saharan Africa.
* Sun education needs to be tailored for sub-Saharan Africa and targeted for its multiethnic subpopulations.

This manuscript is original work, it has not been published in any way or form before and it is not under consideration for publication elsewhere. There are no conflicts of interest pertaining to this manuscript. The manuscript has been read and approved by all six authors. The requirements for authorship have been met. Each author contributed a section based on their discipline-based expertise. All authors believe that the manuscript represents honest work.

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**Authors’ contributions**

CW (CSIR) conceptualised the review article, reviewed material, wrote the first draft in parts (sun exposure section, eyes, melasma) and pulled the article together; MN (University of Edinburgh) wrote the section on immune system and reworked the article several times to improve its readability and editorial changes; BS (MEDUNSA) contributed to the section on melasma; LD (UCT) contributed to the section on skin cancer; GC (SAWS) assisted with understanding of the UV network and information on UV in South Africa; and MO (UL) contributed to the section on ocular effects.

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**Summary:** Abstract: 204 words; Main text: 3172 words; 1 figure; 47 references.

We look forward to hearing from you.

Yours sincerely,

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