Session: C3 Poster: W188A

Ambient solar UV radiation and seasonal trends in potential sunburn risk among schoolchildren

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The detrimental effects of excess personal solar ultraviolet (UV) radiation exposure include sunburn, immunosuppression and skin cancer. In South Africa, individuals with minimum natural protection from melanin, including fair-skinned individuals, African albinos and people spending extended periods outdoors and unprotected, especially during high solar UV radiation hours, are at risk of sunburn, a risk factor for skin cancer. Previous studies have shown that children are exposed to potentially high, sunburn-causing solar UV radiation levels during school hours. Baseline information on patterns of potential schoolchild sunburn risk in South Africa is required to intervene effectively. To estimate national potential child sunburn risk patterns, monitored ambient solar UV radiation levels for Pretoria, Durban, Cape Town, Cape Point, De Aar, and Port Elizabeth were converted into possible schoolchild solar UV radiation exposures using the reported 5% of the total daily ambient solar UV radiation. School-going children with skin types I, II and III were identified as being at greatest risk of sunburn. There were 44 and 99 days in a year when schoolchildren with skin type III (only moderately sensitive) living in Durban and De Aar, respectively, would be likely to experience sunburn. Schoolchildren with skin types I (extremely sensitive) and II (moderately sensitive) living in all six locations were at risk of experiencing sunburn on at least one day per year, the total number of days per year ranging from 14 in Pretoria (skin type II) to 166 days in De Aar (skin type I). Seasonal patterns show schoolchildren may experience sunburn in spring, summer and autumn months depending on geographic location. While sunburn risk depends on schoolchildren's skin type and season, as well as sun protection, timing and duration of exposure, and activity, results will help inform skin cancer prevention and sun protection awareness campaigns.