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**Association between ambient ultraviolet radiation at birth, skin type, skin cancer history and pancreatic cancer.**

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*Background:* Ecological studies suggest that people living in areas with lower ambient sunlight are at higher risk of pancreatic cancer. However these studies have major limitations and there have been few attempts in observational studies to assess the association between measures of sun exposure and pancreatic cancer. Moreover, the results from the ecological studies have been attributed to differences in circulating vitamin D, but several cohort studies have suggested that people with higher serum 25 hydroxy vitamin D are at higher rather than lower risk of pancreatic cancer. This is clearly an area which requires further exploration.

*Methods:* We undertook a population-based case-control study in Queensland, Australia between 2007 and 2011. We recruited 704 cases and 709 age- and sex-matched controls. Participants were asked to undergo an interview in which we captured sociodemographic, medical history and lifestyle information, as well as information about location of birth, skin cancer history and skin type (measured as skin colour, tanning ability and propensity to burn). We used NASA's Total Ozone Mapping Spectrometer (TOMS) to assign an ambient ultraviolet radiation (UVR) value to each location of birth, and divided this into tertiles. Multivariable logistic regression analyses were used to identify associations between UVR at birth, skin type and self-reported skin cancer history.

*Results:* Approximately 60% of both cases and controls were men and the mean age of all participants was 67. People born in areas with high UVR were at lower risk of pancreatic cancer than those born in an environment with low UVR (OR highest versus lowest UVR tertile 0.76, 95% CI 0.56-1.01 (adjusted for age, sex, smoking, diabetes, BMI and alcohol use)). All measures of skin type were significantly associated with pancreatic cancer risk, with those with the most sun sensitive skin being at approximately half the risk of those with the least sun-sensitive skin (for example, comparing those who burn badly with those who don't burn at all: adjusted OR 0.51, 95% CI 0.36-0.73). People who had been diagnosed with skin cancer or other sun-related skin lesions had a 40% lower risk of pancreatic cancer than those who had not had skin lesions treated (OR 0.60, 95% CI 0.48-0.75).

*Conclusions:* These findings support several ecological studies showing that exposure to high UVR confers a lower risk of pancreatic cancer. Given the findings of the studies examining circulating vitamin D, it is possible that if exposure to UVR does decrease risk of pancreatic cancer it is acting independently of vitamin D. Understanding the potentially complex role of UVR in pancreatic cancer needs further study, as this may provide an avenue for preventive strategies.