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**Ecological evidence for lower risk of lymphoma with greater exposure to sunlight and higher altitude**

**Introduction:** Sunlight exposure may influence vitamin D-related immune modulation and motility of T lymphocytes, thereby impacting Hodgkin lymphoma and non-Hodgkin lymphoma (NHL). Altitude may also be associated with these cancers through an oxygen-related mechanism or radiation hormesis.

**Methods:** An ecological study design was used, with county-level lymphoma, sunlight, altitude, urban residency, poverty, smoking, obesity, and physical inactivity data for 16 cancer registries (607 counties) in the contiguous United States, 2012-2016.

**Results:** Higher rates of Hodgkin lymphoma and NHL are associated with being male, older and white or black for NHL. Tobacco smoking, urban residency, obesity, and physical inactivity are not associated with these cancers. Both increased sunlight exposure and higher altitude are independently associated with lower rates of Hodgkin lymphoma and NHL, after adjusting for age, sex, and race. The inverse association between sunlight and Hodgkin lymphoma is only in the lower altitudes. The inverse association between sunlight and NHL is more pronounced with higher altitude.

**Conclusion:** Greater sunlight exposure and higher altitude are independently associated with lower rates of Hodgkin lymphoma and NHL. The inverse associations are dependent on altitude, with the relationship only in lower altitudes for Hodgkin lymphoma and more pronounced in higher altitude for NHL.

**Biography**

Ray M Merrill received his academic training in statistics and public health. He is a former Cancer Prevention Fellow at the National Cancer Institute, USA, and current fellow of the American College of Epidemiology and the American Academy of Health Behavior. He is now a professor in the Department of Public Health, Brigham Young University. He has won various awards for his research. He is the author of more than 280 peer-reviewed publications, including text books titled *Environmental Epidemiology*, *Reproductive Epidemiology*, *Principles of Epidemiology Workbook*, *Fundamentals of Epidemiology and Biostatistics*, *Behavioral Epidemiology*, *Statistical Methods in Epidemiologic Research*, *Introduction to Epidemiology*, and *Fundamental Mathematics for Epidemiology Study*.

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