

AN ECOLOGICAL STUDY OF THE ASSOCIATION BETWEEN ETHNIC BACKGROUND AND MALIGNANT MELANOMA MORTALITY IN THE UNITED STATES

Environmental Protection Agency scientists have expressed concern regarding the possible depletion of the earth's ozone layer in the upper atmosphere. The consequence of such reduction in the stratospheric layer would increase the intensity of ultraviolet radiation, with the concomitant increase in the number of people suffering from cancers of the skin. Fortunately, most basal and squamous cell skin cancers are readily treated by physicians in their private offices and, therefore, go unreported. Malignant melanoma, however, can be highly fatal if it is not treated almost immediately, and must be treated in hospitals. This high fatality rate is indicative of the melanoma incidence and is a more accurate index of its frequency.

Both the incidence and mortality rates of melanoma have increased since the 1950s, which may be partially due to better clinical diagnosis. Currently, the higher mortality rate is regarded as indicative of a multiplication in the number of affected people, which may be due to increased ultraviolet radiation exposure as a result of ozone depletion, although the etiology of this disease is not fully understood.

In his article "Malignant Melanoma: A Controlled Study of Possibly Associated Factors", G.A. Gellin suggests that genetic or ethnic background may play havoc with the ultraviolet-melanoma relationship. Specifically, the distinguishable characteristics of melanoma sufferers include light skin, light eyes, and red or blond hair. International reports support this trend by comparing mortality rates from countries with diverse latitude bands. Additional research suggests that behavioral inputs, as measured by components of the socio-economic status, may influence the incidence of the disease. This, however, is a most difficult factor to measure and interpret.

In reality, these factors may interact with each other. The human ecology perspective of disease provides a useful paradigm, which consists of a tripartite system, for the integration of the relationships. They are: (1) population - genetic characteristics; (2) habitat-environmental conditions, including physical structures and clothing; and (3) behavioral features - that which the population does in the habitat. A change in any of these factors would alter the ecology of the disease. These factors are not uniformly distributed throughout the U.S., thus the geographical distribution of melanoma will be affected by irregular dissemination.

The purpose of this paper is to evaluate the relevance of factors representative of these components in explaining the distribution of melanoma mortality since they are not uniformly distributed throughout the United States.