

Pesticides and Cancer Rates in Costa Rica

Catharina Wesseling et al., "Geographical Differences of Cancer Incidence in Costa Rica in Relation to Environmental and Occupational Pesticide Exposure." International Journal of Epidemiology 28(3), June 1999, pp. 365-374.

A study in Costa Rica looked at variations in cancer incidence based on geographic location and considered possible links to pesticide exposure. The study included 39,647 cancer cases recorded between 1981 and 1993 in Costa Rica's national cancer registry. Data from the registry were analyzed together with information on population, agriculture and pesticide use.

The study found a number of regional differences in cancer incidence. For example, elevated rates of skin cancers (including melanoma and cancers of the lip and penis) were found in coffee growing areas characterized by extensive use of paraquat and lead arsenate.

When the most rural counties were considered on their own, high levels of pesticide exposure were associated with elevated cancer rates overall. Rural counties with high pesticide exposure levels also had elevated rates of specific cancers, including elevated rates of female hormone-related cancers and a doubling in risk of lung cancer for both men and women. Rural counties characterized by high exposure also had elevated levels of melanoma and cancers of the esophagus, gallbladder, larynx, bone, and bladder among men and increased risk of colorectal, liver, gallbladder and brain cancer among women.

The authors argue that differences in smoking are unlikely to account for this dramatic difference in lung cancer rates even if smoking rates are higher in the high exposure counties. The fact that the elevated lung cancer rates are found in both sexes suggests that whole populations were exposed through such means as aerial drift and contamination of water supplies, rather than exposures simply occurring at work.

Difficulties in interpreting the data include the fact that significant migration occurs among regions. The authors suggest that the elevated rates of melanoma, lung cancer and female hormone-related cancers found in their study "seem particularly interesting topics for epidemiological studies at the individual level."