LAN KILLS (?)

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Light at Night Co-distributes with Incident Breast Cancer but not Lung Cancer in the Female Population of Israel

Objectives: Recent studies carried out among shift working women, have reported that excessive exposure to light at night (LAN) may be a risk factor for breast cancer. However, no studies have yet attempted to examine the co-distribution of LAN and breast cancer incidence on a population level with the goal to assess the coherence of these earlier findings with population trends. The present study attempts to investigate the links between local LAN levels and the incidence of breast cancer, using cancer rates and LAN intensity data available for 147 individual urban localities in Israel. In particular, the present analysis attempts to answer the following question: Is there a link between local LAN levels and the incidence of breast cancer in urban localities after controlling for known potential confounders?

Methods: Nighttime satellite images were used to estimate LAN levels in 147 communities in Israel. Weighted Least Squares (WLS) regression was preformed, to investigate the association between LAN and incidence rates of breast cancer (for which its major causes remain a mystery) and, as a test of the specificity of our method, lung cancer (the dominant cause of which is known) across localities under the predictions that there would be a link with breast cancer but not with lung cancer.

Results: After adjustment for several variables available on a population level such as ethnic makeup, birth rate, population density, and local income levels, a strong positive association between LAN intensity and breast cancer rates was revealed ($P<0.05$), and this association strengthened ($P<0.01$), when only statistically significant factors were filtered out by the stepwise regression procedure. Concurrently, no association was found between LAN intensity and lung cancer.

Conclusions: These results provide coherence of the previously reported case-control and cohort studies with the co-distribution of LAN and breast cancer in an entire population. The analysis resulted in an estimated 37% higher breast cancer incidence in the average LAN intensity communities compared to the lowest, and a further 27% higher incidence in the highest LAN intensity communities compared to the average. In addition, new results from current research regarding the association between nightlight exposure and the incidence of breast cancer in Haifa, Israel will be discussed.