

SPATIAL DISPERSION OF ISCHEMIC HEART DISEASE, RESPIRATORY AND NEUROLOGICAL DISEASES AND METEOROLOGICAL , AIR POLLUTION AND SOCIO-ECONOMIC FACTORS IN ISRAEL'S NEGEV DESERT

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Background and Aims: The potential effects of ambient air pollution and meteorological factors on health have received much attention over the past decades. Epidemiological studies have shown that even small increases in air pollution are associated with increased morbidity and mortality. The present study aims to identify geographical (meteorological and air pollution) short term and socioeconomic impacts on cardiovascular, respiratory and neurological diseases in Beer-Sheva city, located in the northern part of the Negev desert.

Methods: 1. GIS and spatial statistics to analyze the spatial distribution of diseases of ER and hospitalization cases.

2. Vehicular air pollution dispersion model (AERMOD software) to receive spatial exposure proxy of NO₂ and PM_{2.5}.

3. GLM Poisson models based on time series techniques were used to analyze the association of short term meteorological, air pollution and socioeconomic factors with considered diseases rates.

Results: 1. Highest seasonal monthly noninfectious respiratory diseases hospitalization rate is found in the central part of the city. 2. Highest hospitalization rates found during winter. Significantly different hospitalization rate by seasons found for all disease groups studied. 3. Significant association between socioeconomic ranking and monthly hospitalization rates found for non infectious respiratory, diseases, heart ischemic and neurological diseases in 2007. Association of meteorological factors (mean daily temperature and relative humidity) for the elderly (65+) and daily hospitalization rate found for non infectious respiratory diseases in 2003-2007. 5. Association was found between Daily traffic related air pollution is significantly associated with daily hospitalization respiratory and cardiovascular diseases rates

Conclusion: The study showed that short-term exposure to meteorological factors and traffic related air pollution in Beer-Sheva were related to an increase in daily hospitalization rate of cardiovascular , respiratory and neurological diseases, especially in winter time and for the elderly (65+). The results should have implications for environmental thresholds and social policies.