

# SPATIAL RELATIONSHIP BETWEEN INCIDENCE OF GASTRIC CANCER MORTALITY AND OCCURRENCE OF SOILS IN HUNGARY AND IN JAPAN

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**INTRODUCTION:** Among the risk factors of gastric cancer some data point to the association with rural environment, which raises the hypothetic role of the soil. In this study the link between gastric cancer incidence and soil properties supposed to enhance H. pylori survival in soils, such as acidity, water retention and clayiness were studied by spatial analysis using GIS and statistics.

**AIMS & METHODS:** Spatial differences in mortality due to gastric cancer (ICD-10:C16) in both sexes in the age groups of 35–64 y and over 65 years for the period of 1986–1993 in Hungary was studied by cluster analysis using SCAN method based on GAM-K method. The association of mortality and the type of soil (upper layer) was studied by chi2 method.

The results were compared to spatial distribution of gastric cancer mortality of females in the year of 1975 in Japan in relation of soil types using the data of M. Ohtaki (Hiroshima). The analysis was made by extended Growth Curve Model based on Poisson regression.

**RESULTS:** The results of the Japanese analysis showed that gastric cancer mortality was higher by 300% in regions where the soil type is "Gley". In Hungary we tried to find similar associations with the accumulation of clusters and chemical characteristics of the soil. We tried to identify communalities of the different soil types in Hungary and that of gley soil which can be characterized by higher water retention, acidity and high clay content. These requirements are met by the so called "extremely acid and acid soils" as well as "Brown forest" soil types. The statistical analysis showed that gastric cancer mortality was by 400% higher in areas with acid soil for males and by 300% higher for females than elsewhere. This association was weaker for "Brown forest" soil types (150% for both sexes).

**CONCLUSION:** GIS analysis of soil properties and incidence of gastric cancer mortality showed a characteristic spatial distribution in both Hungary and Japan, which is statistically associated with types of acid soils retaining water and promoting suitable environment for bacterial growth. Further analysis is needed to find the environmental causes of gastric cancer like H. pylori or other soil factors.

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