Can Geographic Information Systems (GIS) be of interest for analyzing data of occupational disease surveillance. Example with RNV3P network

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Background and objectives

The « réseau national de vigilance et de prévention des pathologies professionnelles » is a French vigilance and prevention network spread over 32 hospital-based occupational disease centres. Its database contains the following information on patients: socio-demographic data, exposures, workplace, activity sector, diseases.

The objective of this study was to map the patients origin in order to determine attraction areas of work-related diseases in Paris and its suburbs.

Methods

Data used were collected between 2001 and 2009 in Paris area’s Occupational Disease (OD) centres. Only patients with a correct address and a health problem related to work were selected.

Data on the working population per administrative district were obtained from the French National Statistics Institute (Insee). Data were first geocoded by using Batch Geocoder which is an online free tool converting each address of the geographical database to Latitude/Longitude. Once geocoding done, ArcGIS (9th version) software was used for mapping analysis.

Results: From geocoding to mapping

Geocoding addresses in the database

64,291 addresses in database
60,993 (95%) addresses with zip code
58,437 (91%) addresses well geocoded

Figure 1: Treatment of addresses
90.7% were well geocoded and used for mapping.

This map represents the patients origin.

Recruitment occurred mainly in Paris and the 3 bordering departments.

Numbers of patients are equivalent between Paris arrondissements and Val-de-Marne cities (south-east of the map). On the opposite, numbers reported to the working population (penetration rate), highlight an important industrial area in Val-de-Marne.

Discussion and perspectives

This study was a first step on assessing geographical influence on OD centers recruitment.

This work will continue as a collaborative work between clinicians and geographers in order to appreciate on the one hand geographical biases in patients recruitment and on the other hand industries or activities possibly associated with work-related diseases.

This work will highlight the relevance of GIS use for prevention.

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