

Integration of GIS Data in Health Care Utilization

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The process of choosing medical providers for consuming health care services, highly depends on local properties like medical provider (e.g. physicians and hospitals) and population density or distances between single agents of these groups. As a consequence data containing geographical information has to be used. Obtaining, preprocessing and integrating this data into a dynamic model turns out to be a challenging task.

We present an agent-based dynamic model of Health Care Utilization that uses geographical data from two sources: Map data from OpenStreetMap for constructing the GIS-environment and raster data on population density from Statistics Austria. The presented model is held relatively simple as the main focus lies rather on the analysis of GIS data integration with agent based models of health care than on a valid mapping of health care utilization.

GIS data comes in various formats and one has to decide on a general format that can be used all over the model. We integrated all our data into a PostGIS database, where it can be easily maintained as all data can be found at a single location (in contrast to solutions with several data files). AnyLogicTM was used for simulation, but does not provide any means of displaying GIS information from a PostGIS database. As a consequence a class for displaying this information on a map had to be developed. It uses GeoTools for accessing the GIS enabled database.

As a result we show differences when modelling with and without GIS Data and give an outlook on future possibilities of simulation with geographically enhanced data.