

Digital epidemiology supported by GIS as a way for effective communication of the epidemic situation

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There is no central information system supporting epidemiological surveillance in the case of the Czech Republic. For efficient management of epidemiological data, it is advisable to use a Geographic Information System (GIS), in which data can be managed based on their geographical component. The advantages of GIS are not only all tools for managing an ordinary database but also functions typical for geographic data. Technical University of Liberec (Czech Republic) with the support of the Technology Agency of the Czech Republic guarantees the design and building of an information system with GIS features designed for the solution of epidemics within the chosen region of the Czech Republic (Regional Hygiene Station of the Liberec Region). The concept of the information system is based on the requirement to use Open Source tools without the need for future license fees. A substantial part of the system is programmed (R language). Data input will be provided by forms and questionnaires (pre-prepared, editable). The database will be based on demographic data along with multiple time and geographical data (useful for the construction of epidemiological curves and data representation in maps).

Data input is possible via any platform (desktop, smartphones, mobile GIS for fieldwork). The output console is designed to work with data organized in maps. After the necessary anonymization and aggregation of data, some of the data is designed to be made available to the general public. Emphasis is placed on the communication role of the information system in providing information from and to the public.

The research team is multidisciplinary (epidemiologists, geographers, programmers, sociologists). The development of the information system has been started in 2019 on the example of alimentary diseases. A part of it has been used since March 2020 for monitoring COVID-19 within the Liberec Region. Full completion and commissioning are set for 2021.

Key messages:

- Geographic Information System is an effective database, analytical and communication tool for epidemiology.
- The information system must enable communication with experts and the general public.