Abstract of parallel session: 17

Title: A GIS based model to detect regional differences in health care supply structures

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Abstract

Background: Large regional disparities in healthcare utilization have been documented for many countries and for many different types of care [1, 2]. Regional variation of healthcare utilization can have many causes. Broadly speaking, there are factors that can be attributed to patients and factors that can be attributed to regional characteristics. Among other things, the latter category includes the density health care supply services [3, 4].

Objectives: In the context of a feasibility study the main goal was to model health care supply structures in order to develop a spatial indicator (supply density indicator, SDI) for the availability of health care supply services.

Method: Considering medical care, the benefit of the supplied health care services depends largely on the availability of these services to patients. To model regional differences in Swiss health care supply structures we've chosen a GIS based approach. Supply (hospital sites) and utilization (population) can be georeferenced, whereupon driving times can be derived with respect to the underlying street network. The infrastructure is analyzed as a whole, i.e. driving times are calculated between all hospital locations and all residents within a certain maximum radius. All model outputs can be derived from this intermediate dataset, namely the SDI (aggregated region-wise) as well as an estimator for the contribution of a hospital site to the total supply.

Conclusions: The SDI enables a systematic operationalization of the availability of health care supply services and can be differentiated for hospital planning service groups (SPLG) or treatment procedures (Swiss Classification of Operations, CHOP). In particular the SDI can be used:

- *to analyze changes in health care supply density over time,*
- *to analyze reasons of regional variation in health care utilization,*
- *to analyze the impact of accessibility to healthcare services to treatment outcome,*
- *to simulate artificial scenarios like expansion or reduction of supply services.*

References

1) OECD (2014). Geographic Variation in Health Care: What Do We Know and What Can be Done to Improve Health System Performance? FOCUS on health. OECD Health Policy Studies, OECD Publishing: Paris.

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4) Skinner, J. (2012). Causes and Consequences of Regional Variations in Health Care. In: Pauly, M.V., McGuire, T.G., and P.P. Barros, editors, Handbook of Health Economics, 2: 45–93. Elsevier: Oxford.