

Strategic planning of coverage for inpatient healthcare

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Due to demographic change, rural depopulation and medical advancements, the demand pattern for inpatient hospital services is anticipated to change significantly over the next years (Bölt & Graf, 2012). Therefore, the existing hospital infrastructure has to be revised and adapted to the changed conditions. Thereby, decisions about the future location of hospitals, the services offered by a hospital and the capacity (number of beds) per allocated medical service have to be made simultaneously. For this purpose we have developed a multi-criteria mixed integer program, which incorporates the three conflicting targets cost, coverage and continuity. While coverage restrictions are guaranteed by the set of restrictions, cost and continuity targets are represented by objective functions, which are combined in a lexicographic order (Fishburn, 1974). Depending on the selected combination, our model emphasis either cost or continuity of the existing network structure.

We apply our model to the hospital network of North Rhine-Westphalia where the federal government has recently revised the guidelines for inpatient care (MGEPA, 2013). For the district of Muenster we analyse the effects of variations in the in planning requirements such as e.g. minimum capacity levels per hospital or department, discipline allocation requirements, inner-district allocation quotas and restrictions on hospital operator shares (public, not for profit private, for profit private).

Bölt, U., & Graf, T. (2012). 20 Jahre Krankenhausstatistik. In. Wiesbaden: Statistisches Bundesamt, Wirtschaft und Statistik.

Fishburn, P. C. (1974). Lexicographic Orders, Utilities and Decision Rules: A Survey. *ManSci*, 20, 1442-1471.

MGEPA. (2013). Landeskrankenhausplan NRW 2015. Ministry of Health, Equalities, Care and Ageing for the federal state of North Rhine-Westphalia.