Title: *Development of a population-based classification system for assessing morbidity-related health care needs in Germany*

Introduction: An essential prerequisite for improving the equity of health care is the knowledge of the distribution of morbidity-related health care needs. In Germany, there are no suitable analytical instruments for this purpose. Internationally, health care needs are often determined with the help of population-based classification systems, such as Adjusted Clinical Groups (ACGs) or Clinical Risk Groups (CRGs). Such classification systems (cell approaches) assign each insured person to exactly one group, which is characterized by certain clinical properties (e.g., diagnoses, multimorbidity, age) and need for specialized care.

Methods: The development of a population-based classification system (PopGroup) is an iterative process. Medical expertise is taken into account as well as results of analyses of the routine data of a large statutory sickness fund. Based on the full model of 1072 Dx groups (DxGs) defined for the Risk Structure Adjustment used for leveling population disease burden within the German sickness funds, medically meaningful summarized disease groups (ZKGs) are defined (circa 400). Then, based on the ZKGs, roughly 600 mutually exclusive Basis PopGroups (BPG) are formed which are then further stratified forming the close to 1200 terminal PopGroups, to which an insured person can be assigned exactly once, based on individual characteristics as well as medical and treatment characteristics. These PopGroups are both medically meaningful and comparable with respect to their current care needs (economically homogeneous). In the last step, larger Meta-PopGroups (<12 groups) with similar resource consumption are formed.

Results: The definition of a first set of ZKGs, is completed and is currently being validated by medical experts. The definition of Basis PopGroups is in progress, whereby different methods of "unsupervised" and/or "supervised learning" are used (e.g. cluster or CART analyses). In the fall 2022, the first application tests of the PopGrouper are planned, for instance, for the planning of healthcare facilities, for regional comparisons of quality and efficiency of care, or for the evaluation of interventions.

Conclusions: While challenges in the development of medically meaningful and economically homogeneous PopGroups exist, the authors are confident that efforts to create a classification system will be successful. This presentation will explain the context of this project, the results of the work done to date as well as potential future applications for the use of the PopGroup classification system.

Word count: 374 out of possible 500