Summary

Issues considered in the dissertation concern perceptual properties of statistical maps. Its general aim is to compare four basic quantitative cartographical methods of presentation: dot method, diagram method, choropleth method and isoline method, in respect of the three criteria: effectiveness of cartographic communication, its efficiency and spatial generalization of information abstracted from a given map. Importantly, adopted criteria for evaluation of cartographic methods apart from quantitative also involve spatial information, transfer of which in case of map is particularly important and was usually disregarded in previous studies on perception of map content. Furthermore, an important feature of conducted research within this dissertation included taking into consideration acquiring quantitative information at general level of statistical map reading. Such comparative approach increases the possibility for practical implementation of findings derived from dissertation, which can be applied for specific decisions related to selecting the method of presentation. As a consequence of adopted procedure, results concerning each of the four compared methods have been achieved with advanced standardization of sample maps characteristics representing properties of a given method.

The dissertation consists of two main parts: theoretical and empirical. The first one contains consideration aiming to place the study on map content perception in relation to the theory of cartography, providing author's diagnosis of the most important shortages of previous studies on this issue. The second chapter presents author's concept for the classification of cartographic methods of presentation with homogenous criterion for quantitative methods. Furthermore, division of cartographic information transfer process on specific stages and internal structure of cartographic method of presentation have been proposed as well. The second part of this chapter contains review concerning scientific knowledge related to the functioning of particular quantitative methods of presentation.

The second part of the dissertation concerns empirical inquiry, which has been conducted. At the beginning of the third chapter the general hypothesis has been presented, which assumes that quantitative cartographic methods of presentation are diversified in respect of cartographic communication effectiveness at the general level of statistical map reading substantially less than at the detailed level. Six detailed hypothesis have been adopted for the purpose of its verification. In the subsequent part of the third chapter assumptions formulated for the empirical inquiry conducted with experimental method have been delineated. For this purpose, desired variables have been identified and structurized. Four general independent variables have been adopted, whose impact upon the obtained results has been analysed: method of presentation, type of acquired information,

its spatial generalization and spatial order of input data as well as three dependent variables related to adopted criteria of presentation method assessment: correctness of answer, difficulty of providing answer, and its spatial generalization. Further research procedure comprised standardization for the series of independent variables related to the sample maps characteristics and their using during the experiment. Commands for tasks in questionnaire have been delineated and sample of responders has been defined. At the end of the chapter essential conclusions of pilot studies have been listed.

The fourth chapter contains detailed description of the four stages for experiment results analysis and explanation of results in order of consequent detailed hypothesis verification. In order to verify the main hypothesis, results description refers to the impact of generalization of acquired quantitative information on the effectiveness of communication.

Summary of the dissertation provides conclusions related to three layers of conducted work: methodological, cognitive and applicative. Methodological conclusions are related as principle to the assessment for possibility of implementing quantitative approach in the studies on map content perception and comparative approach in the studies on cartographic methods of presentation. Considering the dissertation findings it is postulated to abandon the two strictly interdependent stages of cartographic information transfer, namely cartographic method of presentation and perception of map content. Conclusions of cognitive qualities are dealing with assessment of particular quantitative cartographic methods of presentation in terms of diversified types of information transfer under the adopted criteria. Whereas the conclusions of applicative quality have taken the form of recommendations concerning selection of optimal quantitative method of presentation. If a choice of a given method is not restricted by regards unrelated to perceptual properties of maps, it should be primarily made based upon effectiveness and efficiency of different methods in terms of spatial and quantitative information transfer. If the purpose of cartographic edition is the transfer of information on distribution of a phenomenon, then effective and efficient methods in terms of spatial information transfer are recommended. On the other hand, when the primary purpose is a graphic record of quantitative data relating to space, effective and efficient methods in terms of quantitative information transfer are recommended. For experienced users of statistical maps methods of greater efficiency are recommended, while for beginning map users methods of greater efficiency are recommended.