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## Editorial

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### Edmundas Kazimieras Zavadskas

Department of Construction Technology and Management,  
Vilnius Gediminas Technical University,  
Sauletekio al. 11, LT-10223 Vilnius, Lithuania  
E-mail: Edmundas.Zavadskas@adm.vtu.lt

### Marija Burinskiene

Department of Urban Engineering,  
Vilnius Gediminas Technical University,  
Sauletekio al. 11, LT-10223 Vilnius, Lithuania  
E-mail: marbur@ap.vtu.lt

**Biographical notes:** Edmundas Kazimieras Zavadskas is a Doctor of Science, Professor, Doctor Honours Cause of Poznan, Sankt-Peterburg University and Kiev University, Principal Vice-Rector of Vilnius Gediminas Technical University, Member of Lithuanian Academy of Sciences, President of Lithuanian Operational Research Society, President of Alliance of Experts of Projects and Buildings of Lithuania. He is an Editor-in-Chief of the following journals: *Journal of Civil Engineering and Management*, *Technological and Economic Development of Economy*, Editor of the *International Journal of Strategic Property Management*. His research interests include building technology and management, decision-making theory, automation in design, decision support systems.

Marija Burinskiene is Head of the Urban Engineering Department and Director of Territorial Planning Research Institute of the Vilnius Gediminas Technical University. She has been project manager for more than 40 national projects since 1983, and participated in more than 30 international conferences and was involved in eight Framework five and six programs projects. Her main area of research interest is regularities and specifics of urban and regional sustainable development, development of urban transport system, as well as creation of decision support system for implementation of engineering solution.

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The 2nd WHO International Housing and Health Symposium was held in Vilnius, Lithuania from 29th September to 1st October 2004. More than 230 participants from 26 countries attended this conference. The symposium was organised in 20 parallel sessions: Communities, Residential Environments and Health, Housing Scores and Indicators, Home Safety and Accidents, National and Local Action Plans, Architectural Design, Construction Perspectives and Maintenance Issues, Healthy Urban Planning and Transport and other titles. The selected papers from the sessions named below are included in this special issue 'Internal and External Housing Environments'.

Health is one of the main indicators for evaluating the quality of life and important trends in housing development and strategic points for policy orientation. In this special issue, are the collected papers, which described internal and external housing environments with an emphasis on pollutions and health.

Internal housing environments are presented in the first group of papers. At the beginning of the special issue the WHO LARES study methodological approach and residential conditions impact on residential environment satisfaction and health are analysed. Housing is a health factor that has been neglected in recent decades. Health threats exist in all residential environments. To gain information and to collect data on potential health threats and hazards in and around the home environment, the WHO European Center for Environment and Health and the Bonn Office, conducted a pan-European survey during 2002–2003. The survey collected data in eight European cities on several health-relevant housing parameters and on the health status of residents. A multivariate analysis performed on an international database that contained information on the residential conditions and health status of over 8500 individuals confirmed that various environmental characteristics (e.g., noise, lack of recreational areas, perception of fear, low maintenance, etc.) show significant associations with the residential environment satisfaction reported by residents (i.e., independent of age, socio-economic status, gender or city). The study indicated that the quality of the residential environment is of considerable relevance for the overall satisfaction and the health-related quality of life of residents. Neighbourhood problems are expressed through significant limitations of residential environment satisfaction and an increase of some adverse health effects. Residential environments therefore represent suitable settings/parameters for public health approaches, as there may be considerable health gains to be achieved by improving a neighbourhood's quality. It is intended to use the results of the analysis of the data, collected during this survey for proposing to the Governments of European member states, priorities and evidence on which they could base their housing strategies and policy orientations for achieving the greatest health gains for their citizens.

Deaths and injuries from home accidents are a major, but under-rated, public health problem and certainly an under-rated housing problem. The paper discusses factors contributing to home accidents – human behaviour, and dwelling design and conditions. It discusses work done in the UK to assess the relationship between home accidents and housing conditions, and analyses the LARES database, both of which suggest links between dwelling conditions and accidental home injuries. A deeper analysis was completed on 'healthy housing', based on the WHO Bonn office for environment and health that established a programme on housing and health in 2001. The WHO understanding of 'housing' is based on a four-layer model of housing, taking into consideration the physical structure of the dwelling as well as the meaning of home (for a family and each individual), the external dimension of the immediate housing environment, and the community with all its neighbours.

The topics covered illustrate a wide definition of housing-related health effects, and explore the relevance of housing conditions as a key factor influencing mental health, the quality of sleep, indoor air, home safety, accessibility, obesity, mould growth, hydrothermal conditions and energy consumption, perception of crime, and residential quality. These topics were continued in the paper and described a theoretical model for making a complex analysis of rational housing. The main objective of this paper is to develop a theoretical model for complex analysis of rational housing, according to variable factors of micro- and macro-levels of surroundings, which settle an effective

selection of housing, and describe the factors comprehensively by taking into consideration the experiences and knowledge gained in advanced countries and countries in transition. The paper will apply methods of multiple criteria analysis to help in the solution of problems of micro- and macro-levels of housing, and prepare comparative systems of indicators comprehensively describing housing and health. The paper by an author from the USA is up for discussion on the economic impact of lead exposure in low-quality low-income housing, making a case for a comprehensive statewide remediation policy that targets high-risk housing. Childhood lead poisoning is a major preventable environmental health problem in the USA. The primary source of lead poisoning in children is exposure to deteriorating lead-based paint in older low-quality, and low-income housing. By using studies and combining them with medical and economic research, it is possible to reliably estimate the benefits that are associated with lead-poisoning prevention and provides a cost/benefit assessment of prevention strategies through interim controls and abatement as a way to quantify and pay for these intervention strategies over time. Preliminary results exploring the use of a GIS prediction model and the development of *Elevated Likelihood Measures* (ELMs) on lower and upper threshold risk parameters are encouraging for their use as a method of identifying the highest risk housing and as a means of going toward the development of comprehensive statewide remediation activities. Public reports about housing conditions always discuss the lack of maintenance and poor repair of the dwellings especially in shared ownership, though these reports do not touch the role of the owners in the whole process. This paper concentrates on the role of residents as owners, in creating a healthy and habitable environment by exploring the relationships between housing conditions and a healthy environment especially in the situation of massive homeownership. Maintenance is seen as the major tool that owners can use and manipulate to change their living conditions.

In the second part of the papers include a plan of the impact for external residential environment and health. Urban planning is able to establish a wide range of factors for improving residential environment quality, and which are determined by planning norms, accepted and non-accepted conceptions, style, the planner or investor's competence, as well as the existing physical, social and economic environment.

The authors of papers have described a hypothesis formed on the existence of reliable statistical links, between the quality of individual cities' handling and maintenance, residential environment (i.e., acoustic comfort, air clarity, relaxation opportunities) and individual residents' health, social pathology (alcoholism, criminality) and working capacity indicators. However, the entirety of the correlative relations was also adequate for understanding the problem's complexity and the valuable attributes needed for the formation of a differentiated program of urban reconstruction.

In the paper 'Modelling and forecasting of a rational and sustainable development of Vilnius: emphasis on pollution', life in cities is concentrated mostly in a particular ever-changing environment. Micro, meso and macro environments should be considered as an aggregate of forces influencing sustainable urban development and combine both the factors that have a direct impact and those where the impact is felt indirectly. This research's aim was to develop a model for rational sustainable development in Vilnius and for increasing the city's sustainable abilities.

The third part of the papers, illustrates the possibilities of applying a decision support system for reaching a better quality of life, more healthy housing and their environment. Living conditions and housing provisions are related to human right guarantees and

human resource preservation and development, which have an impact not only on the standard of living in the country but also in predetermining economic, social and demographic consequences. In the countries with a transition economy, including Lithuania, the process of housing provision has not been smooth. The need to evaluate development has led to the measuring of numerous social-economic indicators. However, depending on the large set of indicators, the authors find difficulties in interpreting the progress and often reach different conclusions regarding the economic and social development of towns and in evaluating their sustainability. The capability to evaluate the measurable features, identify the main features, and quantify their relationship with a number of indicators in space makes this approach applicable for a decision support system and for creating a range-system for an evaluation of the potency of towns and regions and for future development of communities as well as the society. The authors of the last paper, on the basis of analysis research and practical literature relevant to pollution minimisation and mitigation processes, proposed a useful Decision Support System for Innovation (DSSI). Different criteria characterising various kinds of pollutions are included in the database of DSSI.