Application of agent-based approach to analyze migration flows taking into account epidemiological situation caused by the COVID-19

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Abstract

Subject/topic. The paper is devoted to the analysis of trends related to migration rates in Russia during the spread of the new COVID-19 infection. ***Objectives.*** The purpose of this work is to study the experience of using the agent-based approach in modeling migration processes taking into account the epidemiological situation. ***Methodology***. The research uses general scientific methods: economic analysis, expert assessments, synthesis, deduction, induction, analogy, modeling, classification, historical and logical analysis. ***Results.*** Migration component is one of the main aspects in the demographic processes for each state. Various factors influence its estimated indicators but there are certain patterns and trends, such as seasonality, political situation in the world, living conditions in a particular country. The importance of this socio-demographic process remains unchanged. In Russia a new concept of state migration policy has been created for a period up to 2025. However, its implementation is complicated by the current epidemiological situation in the world. The spread of COVID-19 forced the country's borders to close which had a serious impact on migration flows. Due to the epidemiological situation migrants are forced to look for new jobs and change the usual routes that they used to move to other countries in order to earn money. In the Russian Federation the number of unemployed has increased and the process of ousting migrants from the labor market has intensified. The spread of the virus around the world has facilitated political decisions related to the return of Russians to their homeland. Thus, the social and political aspects of the consequences of the pandemic have seriously influenced the socio-demographic processes in the world. ***Conclusions.*** The specifics of assessing migration flows implies the use of software and analytical systems to study the general trend of migration including during special periods (economic crises, large-scale outbreaks of epidemics, etc.). The active use of agent-based models which recreates the system under study, as close to reality as possible, can help in solving problems related to the search, analysis, and forecasting of ways to solve acute problems associated with changes in internal and external migration flows. ***Scope of the results.*** The results of the study can be applied for further research in the field of migration processes using agent-based modeling as well as in the process of improving migration policy in Russia with the development of global threats caused by the epidemiological situation in the world.

Keywords: *migration, migratory behavior, region, agent-based modeling, COVID-19, population, political strategy, demography*.

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