EVOLUTION EQUATIONS FOR MEDICAL GEOINFORMATION SYSTEMS

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This presentation reports on a collection of demographic models describing the time evolution of the basic medico-demographic indicators of population: population size, population age distributions, distributions over the types of deceases. The evolution of a population group is considered to be driven by birth--death processes and deceases. For each model a respective set of evolution equation is formulated. These equations include kinetic parameters that have the meaning of the transition rates and whose values are linked to the characteristics of current medico-demographic situation. We consider a number of evolution demographic models of different levels the lowest of which includes uni-gender population, where, in addition, newborns appear irrespective of the population distribution over ages. Then we introduce more sophisticated models that distinguish the ages of the members of community and their gender. We also consider the situations, where infections and deceases affect the medico--demographic state and thus the evolution of the population. The approach relied upon the use of the evolution equation has been successfully incorporated into the Intelligent Medical Geoinformation System (IMGIS) created in GC RAS within the Project supported by the Ministry of Education and Science of RF in 2013 year.