ABSTRACT

The thesis is presented in 110 pages. It contains 3 appendixes and bibliography of 45 references. 39 figures and 4 tables are given in the thesis.

The goal of the thesis is to develop mathematical and software tools for finding optimal strategies to control rotavirus infection.

Age-structured epidemiological model with vaccination coverage and post-vaccination temporary immunity, model with life-long vaccination, model with yearly vaccination, non-age-structured SIR - model, age-structured SIR - model are discussed to study the spread of rotavirus infection and finding optimal coverage of vaccination in order to reduce the estimated cost to the individual and society. According to the formulated criteria, non-age-structured SISV – model and age-structured SISV - model are chosen for solving the task.

With the chosen model was solved three subtasks: find the best coverage for the individual and society, finding minimum cost of vaccination for individuals and optimization of vaccination coverage in terms limited resources. Developed an automated system that implements the method chosen. Tests developed system.

Keywords: RVI, SISV - model without considering age, SISV - model based on age, optimal coverage, susceptible population, vaccinated population, infected population.