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Development of a model for planning specialist education of medical doctors in Croatia

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Abstract. Development of a model for simulation of the needed number of specialists of different specialties in the Republic of Croatia by the year 2035 based on the expected changes in size and age structure of population and experts' estimates of the needs. The model will be implemented in the form of a computer program based on the estimated most potent predictors. The developed model will be used as a tool for the simulation of different scenarios for specialist education combined with other factors like migration flows, changes in retirement age and skill mixing in order to compare different possibilities and options for the renewal of the Croatian healthcare personnel. Results will enable the development of recommendations for decision making and the adoption of a rational plan of referral to specialist training. Indirectly, developed model will be useful for needs assessment and simulation and planning of workforce renewal of other health professionals and for other countries

Keywords. Medical doctors, simulation modelling, specialization, needs and demands for medical specialists

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Introduction

Lack of proper policy planning and human resources management in many countries has resulted in an imbalance of needs and supply with multiple effects on employees in health care. Although the determination of the ratio between the number of health workers and population size including age structure has become an aim of national policy on the human resources development in health care, in most cases remains a gap between plans and their realization. Croatia is a country that needs another 2500 MDs to reach the EU average. Croatian Medical Chamber reports that more than 1300 medical doctors were issued certificates confirming their qualifications in order to work abroad, since Croatia's accession to the EU. Additionally, the average age of working medical doctors with specialization is 50 years and more than 450 medical doctors retire each year so Croatia will need more doctors with specialization than will be available on labour market. Having in mind the duration of specialist training it is obvious that careful and long-term systematic planning is necessary for timely renewal of healthcare workforce which is currently missing at both levels, the total number of medical doctors and number of particular specialties.

Aim

To develop a model for simulation of the needed number of specialists of different specialties in the Republic of Croatia from 2020 to the year 2026 based on the expected changes in size and age structure of population and experts' estimates of the needs.

Material and methods

Model will be developed as multi-compartmental model with compartments of stocks corresponding to number of medical doctors with different qualifications (newly graduated, without specialization, at specialist education for different specializations) across different age groups (one-year age groups will be used) and with flows between groups representing transitions between categories and aging. It is necessary to include in the model the more

significant external push and pull factors and test the sensitivity of the model to their potential changes.

Multi-compartmental model structure will reflect real system structure with flows between compartments analogous to transitions in reality due to course through specialist training. In parallel, age structure will be taken into account and incorporated including outflows due to retirement or death as well as migration flows. Advantages and limitations of system dynamics modelling will be discussed and the possibilities of using other methods like agent-based simulation will be considered.

Period of six years was chosen due to equal duration of medical graduate study and average length of specialist program. External factors (primarily migration flows, prolongation of the working lifetime, changes in enrollment policy etc.) are highly fluctuating and therefore they necessarily need to be reconsidered every six years.

Stella Professional software will be used for model implementation and simulation.

Developed model will be used as a tool for the simulation of different schemes for specialist education along with different scenarios of specialists' migration or retention flows in order to compare possibilities and options for the renewal of the Croatian healthcare personnel.

Expected scientific contribution

Results will enable the development of recommendations for the adoption of a rational plan of referral to specialist training. Indirectly, developed model will be useful for needs assessment and simulation and planning of workforce renewal of other health professionals and for other countries.

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