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Strengthening the public health workforce: An estimation of the long-term requirements for public health specialists in Serbia

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ABSTRACT

At the beginning of the 21st century, planning the public health workforce requirements came into the focus of policy makers. The need for improved provision of essential public health services, driven by a challenging non-communicable disease and causes of death and disability within Serbia, calls for a much needed estimation of the requirements of the public health professionals. Mid and long-term public health specialists' supply and demand estimations out to 2025 were developed based on national staffing standards and regional distribution of the workforce in public health institutes of Serbia. By 2025, the supply of specialists, taking into account attrition rate of –1% reaches the staffing standard. However, a slight increase in attrition rates has the impact of revealing supply shortage risks. Demand side projections show that public health institutes require an annual input of 10 specialists or 2.1% annual growth rate in order for the four public health fields to achieve a headcount of 487 by 2025 as well as counteract workforce attrition rates. Shortage and poor distribution of public health specialists underline the urgent need for workforce recruitment and retention in public health institutes in order to ensure the coordination, management, surveillance and provision of essential public health services over the next decade.

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1. Introduction

At the beginning of the 21st century, planning the public health workforce requirements came into the focus of policy makers in Europe [1]. The public health workforce contributes by performing, supporting and managing essential public health operations [1,2]. They are needed to address public health challenges and to help achieving national and global health objectives such as managing epidemic's (or the risk of outbreaks) of communicable disease and the ever growing pressure of non-communicable disease and health related inequalities [3–10].

Serbia's population health position is challenging when examining various indicators such as mortality rates, burden of disease comparators, risk behavior (smoking, interpersonal violence), antimicrobial resistance and hospital acquired infections and envi-

ronmental threats [6–9]. Risk of depopulation (annual natural increase was –5/1000 population in 2016, and traditional out-migration flows [11,12]) as well as population aging (average population age was 42.9 years in 2016) [11] will likely increase share of single households among elderly population (4.7% was in 2011) [13] and demand for community health care. A need for significant improvement in the provision of health promotion, protection and prevention is additionally highlighted by the fact that Serbia has in the same time predominant burden of non-communicable diseases (in 2014, crude incidence rate of malignant diseases per 1000 population was 5.3 and 4.6 for males and females respectively, age standardized incidence rates of acute coronary syndrome was 2 per 1000 population and of diabetes mellitus it was 1.5 per 1000 population) [14,15], unhealthy behaviour among adolescents [16] and increasing risk from vaccine preventable diseases (in 2014 coverage of children with several obligatory immunizations in Serbia was 86–94% i.e. below the average coverage in Europe Union – EU countries) [17]. Country has modest public health capacities to adequately address consequences of climate changes (e.g. extreme

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heats, river floods and forest fires), health needs of the migrants and refugees that are transiting Serbia, and for active surveillance, prevention and control of communicable diseases, antimicrobial resistance and hospital acquired infections [18–21]. This picture underlines the need for an improved provision of essential public health services which in turn calls for a systematic estimation of public health workforce requirements and planning to meet required levels of demand. As an EU candidate country, Serbia needs to upgrade the public health capacities and policy framework.

In order to develop a better understanding of this under-examined area within Serbia as well as within Europe and internationally, the objective of this study is to assess the stock against the staffing standards and regional distribution of a public health specialist workforce in Serbia, and to project mid and long-term workforce supply and demand in order to guide actions for strengthening national public health capacity by 2025.

There are no estimates of the total stock of workers for public health in Serbia. As context, Serbia's public health workers have a scope of practice that includes analysis of population health, maintaining health system resources databases, quality improvement of health care, health promotion, prevention and control of communicable diseases and non-communicable diseases, environmental health, emergencies, and public health microbiology [22]. Public health specialist groups are mainly medical doctors who have specialised in epidemiology, hygiene and environmental medicine, microbiology and parasitology, or social medicine [23]. Majority are employed in the public health institutes across 25 districts of Serbia [24]. Public health institutes are set up at the Republic, the province and district level (for the territory of several municipalities, or a city) in accordance with the Network Plan of Health Institutions i.e. the regulation which defines the number, structure, capacities and spatial distribution of state owned health institutions and their organizational units by level of health care (hereinafter Network) [25,26].

Main tasks of public health institutes are to monitor, assess, and analyze the health risks and health status of the population and report to the competent authorities and the public; to propose the elements of health care policy, plans, and programs with the measures and activities intended to improve the population health; to disseminate information, provide health education to the population; to assess the efficiency, accessibility to and quality of health care; to develop integrated health care information system; to cooperate and develop partnerships at sub-national, national and international level [26]. Public health institutes make bacteriological, serological, virological, chemical, and toxicological analysis and tests of food, water, air, items of general use, as well as diagnostics of communicable and non-communicable diseases [26]. They coordinate and harmonize the work of health care institutions from the Network, cooperate with the competent authorities of the local self-government and other institutes and organizations, such as primary care, hospitals, non-governmental institutions, civic societies and institutions in other sectors (social, internal affairs, army, education, to name a few) [2].

According to the same by-law [26], a public health institute may be established and perform a health services if, in relation to the total number of inhabitants in the territory for which it is established, there are 29 employees per 100,000 inhabitants, and among them 7 medical doctors with appropriate specialization. Total number of doctors should be allocated for the performance of the following tasks: 1) health promotion – one doctor of medicine, specialist in social medicine; 2) analysis, planning and organization of health care and informatics with biostatistics in healthcare – one doctor of medicine specialists in the appropriate branch of medicine; 3) diseases prevention and control – two doctors of medicine specializing in epidemiology; 4) hygiene and human ecology – one doctor of medicine specialists in hygiene

and environmental medicine; and 5) microbiology – two doctors of medicine specialists in microbiology and parasitology.

Variations in the specific of historical, educational, organizational and regulative development of public health across countries [27] reflect the various concepts of the public health workforce especially relevant when trying to define and compare different health systems use of this workforce [28–33]. Understanding how many public health workers, primarily public health professionals should be available to manage public health programmes and provide essential public health services is a necessary part of health systems and service planning. Planning the public health professional requirements is challenged not only by the variety of their definition but also by the quality of information about their size, composition, education, competencies, performance standards and practice, methods of remuneration and mobility. A variety of methodologies could be used to compile data on the public health workforce [2,33–35], though national registers and routinely updated databases provide consistent and comparable information on public health professionals stock and flow over time. A range of methods and techniques to project future health workforce requirements can include the workforce-to-population ratio, the health needs of the population, expressed service demand, as well as the service targets methods [35].

2. Materials and methods

The study looks at evolution of public health specialist in public health institutes of Serbia over the period 2000–2014, their regional distribution, and supply and demand projections by the year 2025. It is focused on public health professionals in public health institutes i.e. specialists who are legally responsible for the delivery of core public health services in Serbia.

2.1. Public health specialists 2000–2014 in public health institutes of Serbia and their regional distribution

Annual stock data of observed specialists for the period from 2000 to 2014 were disaggregated by age groups (34 years and younger, 35–44 years, 45–54 years, and 55 years and older), sex structure, specialist group and districts. Data was taken from the electronic database on the health workforce of the Network [26].

Following Munga and Mæstad [36], the distribution of the population was compared with distribution of density rates of each specialist group per 100,000 inhabitants in the period from 2000 to 2014. Population data were taken from the Statistical Office of the Republic of Serbia. Density rates were compared with national staffing standards which are seven per 100,000 inhabitants comprising of one specialist of hygiene and environmental medicine, two specialists of epidemiology, two of microbiology and parasitology, and two of social medicine [26].

2.2. Supply and demand projections

Electronic databases comprising the number of residents in public health specialisations, the length of public health specialist training, the average number of years spent as a resident, and the attrition rates, were used to develop supply projections of the public health specialist workforces. Instead of estimating the number of joiners, the attrition was estimated using 'the number of residents and freshmen at specialisation studies' and 'specialist inflow'. Net attrition rate measures the loss of public health specialists due to natural attrition over a year e.g. transfers, retirement, resignation or dismissal. The loss of PHS was estimated using the net change in the observed number of PHS over a year and subtracting the combined estimate of the number of residents that completed training and the inflow of specialists during that period.

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