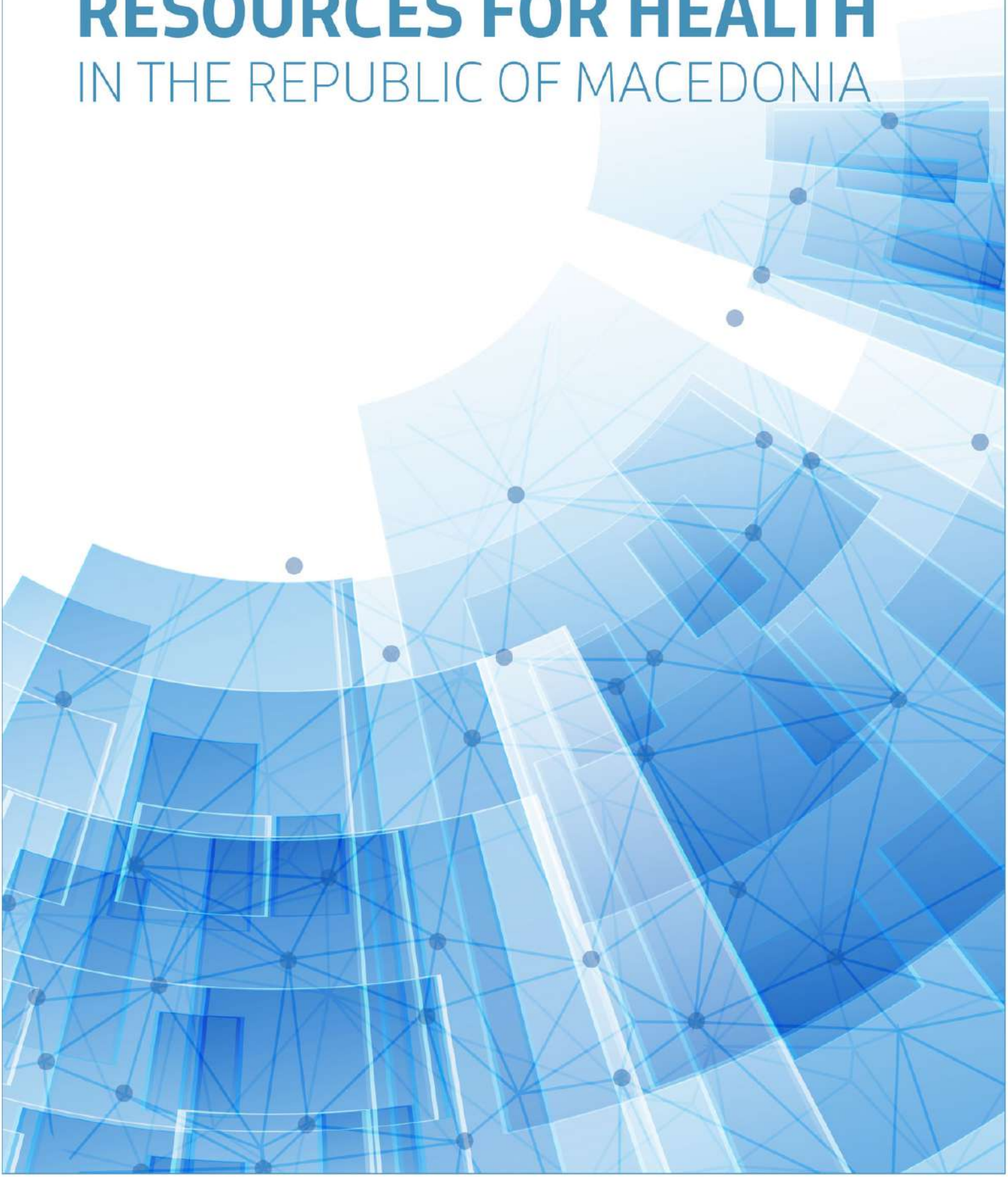
PROFILE OF HUMAN RESOURCES FOR HEALTH

IN THE REPUBLIC OF MACEDONIA



MINISTRY
OF HEALTH

PROFILE OF
HUMAN RESOURCES FOR HEALTH
IN THE REPUBLIC OF MACEDONIA

2017

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List of Abbreviations

CPH	Centres for Public Health
GGHE	General government expenditure on health
HIF	Health Insurance Fund
IPH	Institute of Public Health
MF	Medical Faculty
MoES	Ministry of Education and Science
MoH	Ministry of Health
MoLSP	Ministry of Labour and Social Policy
OOP	Out-of-pocket expenditure
PvtHE	Private sector expenditure on health
THE	Total health expenditure
UKIM	University "Ss. Cyril and Methodius"
UNDP	United Nations' Development Fund
UNFPA	United Nations' Population Fund
UNICEF	United Nations' Children Fund
WHO	World Health Organisation

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EXECUTIVE SUMMARY

In 2016, the Global Strategy on human resources for health: Workforce 2030 has been adopted, outlining policy options for WHO Member States, responsibilities of the WHO Secretariat and recommendations for other stakeholders on how to: optimize the health workforce to accelerate progress towards UHC and the SDGs; understand and prepare for future needs of health systems, harnessing the rising demand in health labour markets to maximize job creation and economic growth; build the institutional capacity to implement this agenda; and strengthen data on HRH for monitoring and ensuring accountability of implementation of both national strategies and the Global Strategy itself.

In the light of the above, Macedonia has initiated the process of development of an Action Plan for Human Resources for Health (HRH), precedent to which is situation analysis and defining the potentials for the future, depicted in this Human Resources for Health profile.

Data was gathered throughout 2016 and first quarter of 2017, from national and international sources. The approach taken was analysis of human resources in the health sector; initial considerations of other human resources working for health have shown that a much wider theoretical framework, definitions and data sources are needed, which are currently not available in the needed format.

Analysis of available data showed that there is significant lack of human resources in health sector in general, and in specific areas in particular. The profile clearly points to the need for development of comprehensive action plan for human resources, in line with the current legislation and policy frameworks of the country. Also, given the dynamicity of labour market, and health system in particular, country could benefit from establishment of electronic database of human resources in health, which can serve as real time monitoring and assessment tool of the future needs, both in terms of development, employment and utilisation of the health workforce.

INTRODUCTION

During the last decade, numerous intergovernmental resolutions as well as action plans have highlighted the importance of HRH strategies and investments.[1,2,3,4,5,6,7,8,9] In 2016, two important global reports were adopted.

The first was the Global strategy on human resources for health: workforce 2030[10] outlines policy options for WHO Member States, responsibilities of the WHO Secretariat and recommendations for other stakeholders on how to: optimize the health workforce to accelerate progress towards UHC and the SDG (objective 1); understand and prepare for future needs of health systems, harnessing the rising demand in health labour markets to maximize job creation and economic growth (objective 2); build the institutional capacity to implement this agenda (objective 3); and strengthen the system on data collection and analysis on HRH for monitoring and ensuring accountability of implementation of both national strategies and the Global Strategy itself (objective 4).

The second was the UN High Level Commission on Health Employment and Economic Growth, which has a five-year action plan (2016–21) for an expanded, transformed, interdependent and sustainable health workforce to accelerate inclusive economic growth and to ensure healthy lives, well-being, equity and economic security for all.

In the light of the above, Macedonia has initiated the process of development of an Action Plan for Human Resources for Health (HRH) 2020, precedent to which is the situation analysis and defining the potentials for the future, depicted in this Human Resources for Health profile. It provides overview of the current state with human resources for health, including health providers and public health capacities and services, as key pillars of the promotion, protection and maintenance of good health.

Further, it gives an overview of how to structure, create and maintain a good and professional workforce for health, looking into the pre-service and continuing medical education, in the attempt to address the need for a coordinated approach in linking HRH planning and education, inter-professional education and collaborative practices, to respond to the health challenges and threats at individual and

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[1] Human Resources for Health: Overcoming the Crisis [report of the Joint Learning Initiative]. 2004. Available at http://www.who.int/hrh/documents/JLi_hrh_report.pdf
[2] World Health Organization. The World Health Report 2006: Working Together for Health. 2006. Available at http://www.who.int/whr/2006/en/index.html
[3] WHO, Global Health Workforce Alliance. Kampala Declaration and Agenda for Global Action. (2008). Available at http://www.who.int/workforcealliance/knowledge/resources/kampala_declaration/en/
[4] WHO (2012). European Policy Framework for Health and Wellbeing "Health 2020", available at:
[5] Global Health Workforce Alliance Strategy. The Global Health Workforce Alliance Strategy 2013-2016: Advancing the Health Workforce Agenda within Universal Health Coverage. 2012. Available at http://www.who.int/workforcealliance/knowledge/resources/ghwastrat20132016/en/index.html
[6] Global Health Workforce Alliance, World Health Organization. 2013.
[7] The Recife Political Declaration on Human Resources for Health: Renewed Commitments towards Universal Health Coverage. 2013. Available at http://www.who.int/workforcealliance/forum/2013/3gf_finaldeclaration/en/index.html
[8] UN Agenda 2030 for Sustainable Development, available at: https://sustainabledevelopment.un.org/post2015/transformingourworld
[9] WHO (2016). Final report of the expert group to the High-Level Commission on Health Employment and Economic Growth. Available at: http://apps.who.int/iris/bitstream/10665/250040/1/9789241511285-eng.pdf?ua=1
[10] WHO (2016). Global strategy on human resources for health: workforce 2030, available at: http://who.int/hrh/resources/globstrathrh-2030/en/

community level, as well as in regular and extraordinary circumstances, such as epidemics or other natural and man-made emergencies. Beyond mere description of the human capacities, the profile also takes into consideration the governance and management of the human resources for health, as inseparable elements of any good public policy, and provides recommendations for action in line with the mission of the health system and the whole government – to ensure highest attainable state of health, within the possibilities through most efficient and effective use of the available resources, while providing opportunities for professional development of the health workforce.

The National Health Strategy 2020 acknowledges the importance of the human resources in the process on delivery of health targets, not only in the health sector but in other health related sectors as well, through providing distinct pillar within its structure – dedicated to health system and resources, both human and infrastructure. As part of this pillar, the Strategy is envisaging development and implementation of Action Plan for Human Resources for Health until 2020. This profile is intended to assist the process of planning of human resources for health and towards the design of an action plan to achieve the vision and strategic goals set in the National Health Strategy 2020 and the national development agenda.

1. COUNTRY CONTEXT

1.1. Geography and demography

Macedonia is a landlocked country situated in southeast Europe on the Balkan Peninsula. It has a total population of 2.1 million; 57.8% of the population live in the 34 cities, the highest concentration being in the capital, Skopje (20.5%) (State Statistical Office, 2015). The country adopted the Nomenclature of Territorial Units for Statistics – NTES in 2007, under which it is planned into 8 non-administrative (so called statistical) regions (East, Northwest, Pelagonija, Polog, Skopje, Southeast, Southwest and Vardar), administratively divided into 80 municipalities and the City of Skopje (State Statistical Office, 2015).

According to the last Census 2002, the ethnic structure of the population is very mixed, including 64.2% Macedonians, 25.2% Albanians, 3.9% Turks, 2.6% Roma, 1.8% Serbs, 0.8% Bosniaks, 0.5% Vlachs and 1.0% others (State Statistical Office, 2003). With regards to religion, 65% of population are Orthodox Christians, 33% Muslims, 2% Catholics or other (State Statistical Office, 2003). Urban population in the country is 57.1% (World Development Indicators, 2016). Projection on total population for 2015 is 2 078 453 citizens. Population density is 82.4 people/square km (WDI 2016).

1.2. Economic and political context

Measured by the Gini index, the inequalities of the distribution of income among individuals or households within the economy have further improved from 40.9 in 2010 to 33.7 in 2015. In comparison to other countries is slightly higher than the EU average of 31 and in the region, Serbia (38.2), Bulgaria (37) and Greece (34.2) have higher coefficients, while Slovenia (24.5) and Croatia (30.6) have lower Gini index.[11] Further, there are geographical inequalities of income within Macedonia; regional analysis of the Gini index indicates that the North-eastern region has the highest degree of income inequality (46.58), while the lowest inequality is recorded in Pelagonija region (33.68).[12] The analysis of the material deprivation, poverty and social inclusion identified that 30.8% of all surveyed households are materially deprived, and the majority of the population cannot afford to pay for unexpected expenses (49.9%).[13]

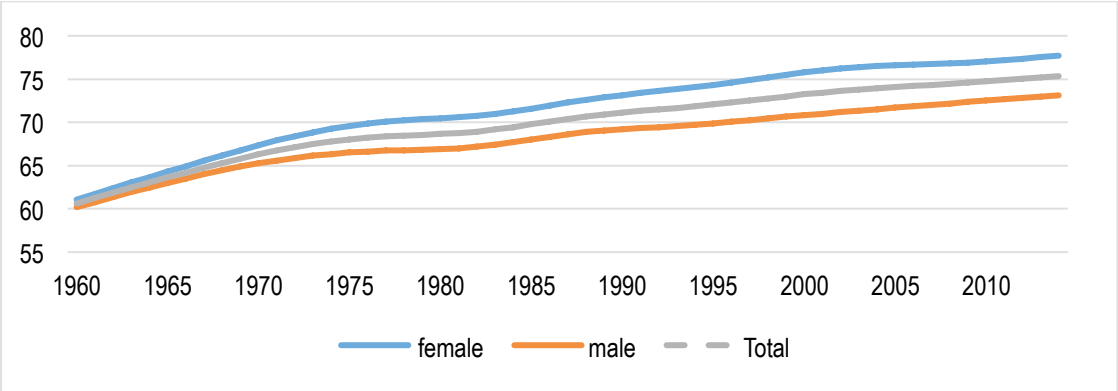
Unemployment levels are extremely high; despite a recent drop since 2005 when it reached its maximum of 37.3% of entire labour force, the unemployment rate of 27.9 in 2014 remains one of the highest in South Eastern Europe and is also among the highest worldwide (World Bank, 2014).

[11] Eurostat Data Explorer, Gini coefficient of equivalised disposable income - EU-SILC survey, accessed on 15.04.2017
[12] Gerovska Mitev M (2012). *Material deprivation, poverty and social exclusion among households in Macedonia*. Skopje, Friedrich Ebert Stiftung (http://www.fes.org.mk/pdf/MATERIAL%20DEPRIVATION%20eng..pdf , accessed 17 August 2016).
[13] ibid

1.3. Overview of health status

Macedonia has seen an increase of average life expectancy at birth from 71.1 years to 75.1 years in 1991 and 2010 respectively, making it comparable to the new EU member countries in the region. Yet, as in many other countries, the female to male disparity in life expectancy is substantial; according to the WHO data published in 2015, the life expectancy for male is 73.5, and for female 77.9.

Figure 1. Life expectancy at birth (years)

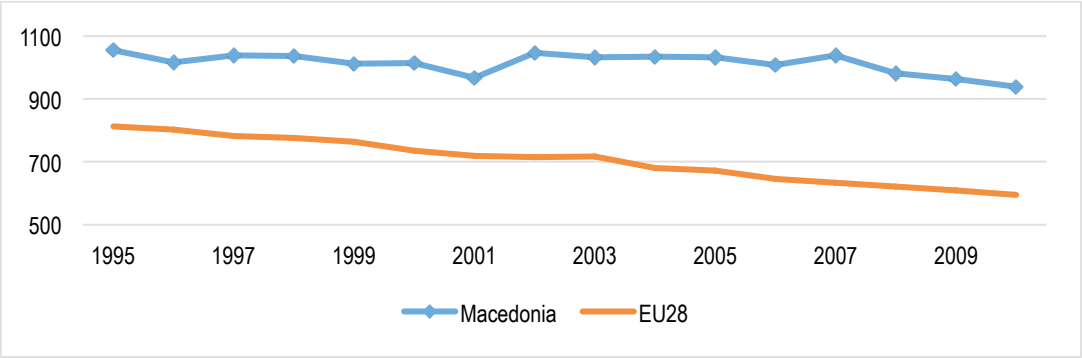


(Source: World Bank Data (2017)

An analysis of the causes of mortality (see Table 1) shows that similar to many other European countries, the main causes of death are diseases of the circulatory system.

According to the Table 1, the leading causes belonging to the World Rank 1-20 are Inflammatory/heart, lung cancer, breast cancer, ovary cancer and uterine cancer, some of them preventable if appropriate measures are timely taken. Since 1995, the standardized death rate (SDR) for these diseases has been fluctuating with a peak in 2005 (620.98 deaths, all ages, per 100 000) and decreasing in steady fashion ever since. However, in 2010, it was still 2.5 times higher than the EU average (219.42). Likewise, the SDR for all causes has decreased from 1055.92 in 1995 to 939.5 in 2010, with some fluctuations over the period, but still was 1.6 times higher than the EU average in that year (596.12) (WHO Regional Office for Europe, 2014). Such divergences from EU countries, despite the similar disease pattern, might be attributed to prevailing unhealthy habits and behaviour (unbalanced diet, high rate of smoking and drinking and low physical activity) and psychosocial factors, as well as low input into the health promotion and monitoring of risk factors towards prevention and control of non-communicable diseases.

Figure 2. SDR all causes, all ages, per 100,000



(Source: WHO Health for All Database Explorer)

According to the 2013 Annual Report of the Institute of Public Health, 40-50% of population over 15 years of age are regular smokers, which is far from the EU average of 22.74% (Institute of Public Health 2014). In the 2008 European Survey for Alcohol and Other Drugs Use (ESPAD), out of the total number of surveyed adolescents in Macedonia, 42.7% reported to have smoked cigarettes in at least one situation. The average age when adolescents begin to smoke cigarettes or start to consume alcohol is 15 years. According to the same survey, 7% of adolescents use sedatives, while in Europe this percentage is 6% (Kamchev et al 2012).[14]

Unhealthy habits are also present in nutrition, with average daily intake of fats of 34.1%, higher than the recommended (<30%), which Europe ranges from 37% in West EU to 46% in the South and in Central East Europe is around 39% (Elmadfa et al 2009).[15] There is an exceptionally high sodium intake of 7,883 mg, compared to the recommended values (500-2500 mg), and a salt intake higher than the recommended 5g/day, as a result of large consumption of processed foods (Institute of Public Health 2014). Other risk factors are also very prevalent among the population. The alcohol consumption is 5.7 litres/person; the obesity is 18.3% (male) and 20.9% (female). (World Data Atlas-World Bank, Knoema, 2014; WHO 2014). These behaviours translate into high mortality in major disease categories, as explained earlier and shown in Table 1 below.

[14] Kamchev N, Danilova M, Ivanovska V, Kamcheva G, Velichkova N, Richter K. (2012). General overview of the health care system in the Republic of Macedonia: health indicators, organization of health care system and its challenges. In: *Health Overview,* Volume 1 of the series Advances in Predictive, Preventive and Personalised Medicine pp 153-166, Springer Science

[15] Elmadfa I. et al (2009). European Nutrition and Health Report 2009, European Commission, Health and Consumer Protection, Directorate-General

Table 1. Leading causes of death, 2013

Cause of death	No. of deaths	Percentage (%) of total deaths	The age-adjusted death rate per 100,000
Stroke	4,096	23.63	133.77
Inflammatory/Heart	3,656	21.09	118.29
Coronary heart disease	2,294	13.23	77.57
Lung cancer	924	5.33	32.34
Diabetes mellitus	845	4.64	26.46
Hypertension	634	3.66	20.45
Colon/rectum cancer	487	2.81	16.54
Breast cancer	348	2.01	24.09
Liver cancer	249	1.43	8.45
Prostate cancer	202	1.17	14.83
Ovary cancer	111	0.64	7.42
Uterine cancer	102	0.59	6.81

(Data Source: WHO 2014)

It is however, noteworthy that the reporting systems are not entirely comprehensive, which may be distorting the actual data for some of the indicators.

With all of the above, it is evident that health system plays key role in prevention of diseases and maintaining good health, in which process human resources are essential. The subsequent chapters provide definition of human resources for health and lay down an overview of the situation with health workforce in the country.

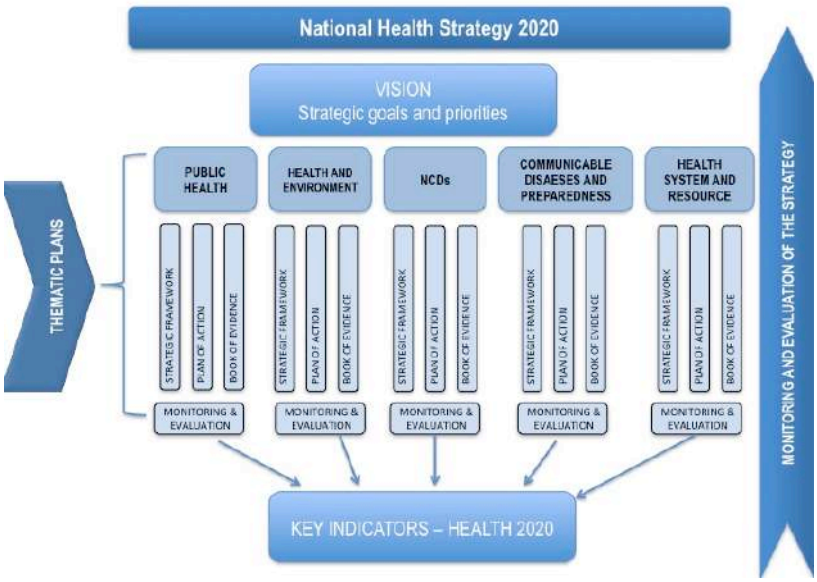
2. OVERVIEW OF THE HEALTH SYSTEM

2.1. Governance

The health system of the country is governed by the Ministry of Health. The process of planning of human resources is addressed as part of other strategic documents, policies and plans, depending on the availability of data and depth of situation analysis performed. However, a comprehensive strategic document or policy on planning, management and evaluation of the HRH at national level is needed.

The planning of education for new human resources in health is a process jointly undertaken by the Ministry of Health and the Ministry of Education and Science; each year based on assessments, the admission levels for specialization and sub specialization in all levels of care are revised. Within this process, every year, the Institute of Public Health publishes a report on the distribution of human resources across the health system in the country, both in public and private domain; while the report can serve as source of data on HRH by number and type, it does not contain in-depth analysis of the resources or policy-relevant interpretation of the findings, relative to the population structure and needs. Detailed list of stakeholders involved in human resources in health with their competences and responsibilities is presented in Annex section of this document.

Figure 3. Human resources for health within the National Health Strategy 2020



Bearing in mind the above, the National Health Strategy 2020 acknowledges the importance of human resources in the process on delivery on health targets, not only in the health sector but in other sectors as well, through providing distinct pillar within its structure – dedicated to health system and resources, both human and infrastructure. As part of this pillar, the Strategy is envisaging development and implementation of Action Plan for Human Resources for Health until 2020, to contribute to the achievement of the vision and strategic goals set in the NHS2020 and national development agenda.

2.2. Service provision

Service provision is organized in a traditional health system structure in primary, secondary and tertiary levels of care and public health services. Preventive care plays significant role at all levels of care, especially at the primary level.

There is geographically well-distributed network of health institutions throughout the country in primary and secondary levels of care, while tertiary care is mainly provided in the capital city of Skopje (IPH 2016).[16] With the transformation of the primary care in 2007, providers at primary level, and community pharmacies were transferred to the private domain, but continued to provide services within the health insurance scheme, and to be part of the public-health system. The ownership and governance of the public sector institutions lies completely with the Government through the Ministry of Health, which also regulates the sector. The services are purchased through contracts with Health Insurance Fund, based on policies developed by MoH and endorsed by the Government.

Public health services are provided through an extensive public health network of institutions and councils for public health. The main institution is the Institute of Public Health, which supervises the work and professional standards of operation of the 10 regional Centres for Public Health. Their core competences are implementation of the 10 essential public health operations (EPHO), through sanitary and hygienic activities, epidemiology, social medicine, laboratory services and so forth. The 34 Health Centres are responsible for providing emergency health services, polyvalent patronage home visiting, preventive health services, including immunisation and preventive check-ups for school children and youth under the national preventive programs (Public Health Program, Program for systematic check-ups of school children and students, Immunisation Program). In towns with no hospitals, the health centres provide specialist-consultative services.

Primary care is provided by chosen physicians from general practice, paediatrics, gynaecology and dentistry. At primary care level they play the gatekeeper role in the health care system and are accessible to all citizens without any cost at the point of delivery. Patients register with a primary care physician of their choice but can switch to a new one only twice per year. However, although private, they provide services exclusively within the health insurance scheme, and thus represent constitutive part of the Health Network and the provision of services from public funding.

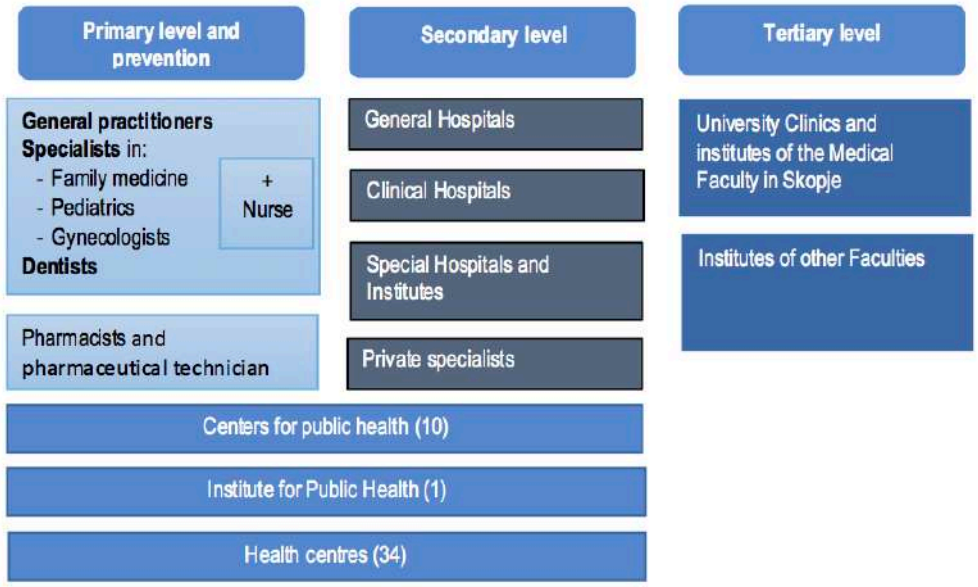
Secondary care consists of geographically well-organized specialist-consultative services in the Health Centres and a network of general, specialized and clinical hospitals and university clinics. The type and volume of specialist-consultative services delivered at the Health Centres are defined at state level according to historical data, health care needs and financial arrangements. Hospital care is subject to regional standards. Emergency care consists of emergency care units at all levels of healthcare, determined by the Government based on the Ministry of Health's recommendations.

Tertiary care is provided at the University clinics in Skopje, defined according to the criteria for provision of health services that require professionally, organizationally and technologically complex and multidisciplinary treatment. The majority of hospitals are in public ownership although the share of

[16] IPH (2016). Health Map of the Republic of Macedonia 2015, part I, available at: http://iph.mk/wp-content/uploads/2017/06/Zdravstvena-karta-2015-del-1-MK.pdf

private hospitals increased in the past decade. In 2013, there were in total 73 healthcare facilities providing inpatient care, among which 14 general and 3 clinical hospitals[17] at secondary-level, as well as 28 tertiary-level university teaching clinics.[18,19]

Figure 4. Human resources in the health system in Macedonia



The Law on Health Care adopted in 2012 and amended in 2013,[20] established the Health Network which determines types of healthcare services, physical and human resources and hospital bed stock for each medical specialty and type and number of diagnostic and other medical equipment for each level of healthcare services. The Health Network integrates preventive, primary, secondary and tertiary healthcare service provision, and includes public and private healthcare facilities. Providers can submit applications to become part of this network, and this is validated by the Ministry of Health, with certification and inclusion in health insurance scheme through contract with the HIF. The main aim of the Health Network is to ensure equal geographical access to healthcare.

Since the independence, the health system has undergone many reforms aimed at better health services quality and coverage, and which have inevitably affected the human resources for health.

2.3. Health system financing

The health system is financed through two main sources: Ministry of Health is financing capital investments and preventive programs, whereas Health Insurance Fund is the main purchaser of

[17] General and clinical hospitals provide healthcare at secondary level distinguished only by types of diagnostic and treatment services offered (e.g. certain surgical services available in clinical hospitals are not provided in general hospitals).
[18] Non-hospital units are in-patient facilities functioning mainly as maternities being part of the Health Centres.
[19] Capacities in hospital sector in 2014, Institute of Public Health 2015
[20] Law on Health Care, Official Gazette of the Republic of Macedonia 10/2013 (consolidated text)

services under the health insurance.

Ministry of Health finances capital investments in the public domain, in health centres, hospitals and institutes, and implements preventive measures through the annual health programs directly financed from the central budget. The Ministry of Health proscribes and finances the preventive programs that scope all citizens regardless of their health insurance status, preventive measures for certain diseases and trough curative programs subventions for services and co-payments of certain categories of patients such as patients with renal failure, diagnostics of patients with cancer, children up to 1 year old, medications for rare diseases and insulin for persons with diabetes.

Compulsory health insurance contributions constitute the major source of HIF public financing in Macedonia with 89% of total health revenues in 2015.

Although total health care expenditure in Macedonia has increased in absolute numbers (as measured as health expenditure per capita in US$ PPP), it constantly fell as a percentage of GDP since the late 1990s. Between 1995 and 2003 total health expenditure still slightly increased from 8.4% to 9.2% reaching a peak of 10% in 1998. Over the following five years it decreased considerably to approximately 7% in 2007 where it remained relatively stable, reaching 6.5% in 2014 (WHO Regional Office for Europe, 2016; World Bank Indicators 2016). Government health spending as share of total government spending has been declining from 13.7% in 1995 to 11.7% in 2011, partly as a result of the reduced health contribution rate from 9.2% to 7.3% of the gross salary, as one of the measures of decreasing public taxes policy.

Table 2. Trends in health expenditure, 1995 to 2013 or latest available year, WHO estimates

Expenditure	1995	2000	2005	2013
Total health expenditure per capita, PPP (in US$)	416	508	620	759
Total health expenditure as % of GDP, WHO estimates	8.4	8.7	8.1	6.4
Public sector expenditure on health as % of total expenditure of health, WHO estimates	59.6	57.7	61.9	68.9
Public sector expenditure on health as % of total government spending, WHO estimates	13.3	15.0	13.7	13.2
Government health spending as % of GDP[1)]	5.0	5.0	5.0	4.6
OOP payments as % of total expenditure on health	40.5	42.3	38.1	31.1
OOP payments as % of private expenditure on health	100	100	100	100

(Source: WHO Regional Office for Europe 2015; [1)] World Bank Indicators 2014)
(Adapted from: Milevska Kostova et al 2017)

In 2015, there were 1.84 million insured persons (slight decline from 1.9 in 2007), which represents 89.2% coverage, and includes insured persons (57.5%) and their dependants (42.5%).[21] The directly insured persons are mainly insured on the grounds of employment (46.4%), pensioners (27.6%) and

[21] The percentage of coverage is based on population projections, since the last census of the population was in 2002, and thus the actual percentage of coverage is not known

unemployed (22.7%), while smaller percentage of the insured are farmers (1.6%) or insured on other grounds (1.7%). Health contribution rate is fairly low, only 7.3% of the gross salary. The basic benefit package is widely defined and is fully covered by the HIF; it includes almost all of the treatments and rehabilitation services with a small co-payment by the patients. However, some care is funded privately, by user charges and direct payments by individuals for items such as OTC drugs and aesthetic surgery, or by direct payments by individuals for health care delivered in private healthcare providers, for services that are not covered by the HIF. Insured persons pay user charges as co-payments for up to 20% of value of the health services and medications, and up to 50% for certain orthopaedic devices. However, out-of-pocket payments, as shown in Table 2 above still constitute significant share in the total health expenditures.

2.4. Health information system

Upon recommendation to set up a health information system by the Health Sector Transition Project (1996–2002) supported by the World Bank, the country has undertaken efforts to create an integrated system involving the Ministry of Health and the HIF. In 2006, the Ministry of Health prepared an Integrated Health Information Strategy (IHIS) which main aim was to recommend the necessary actions to rectify deficiencies in health information systems and to put in place frameworks to ensure optimal development and utilisation of health data as well as parameters to monitor the health status in wider social context.

Based on the IHIS recommendations, in 2013 a comprehensive health information system was introduced, throughout the health system. In 2015 the Government established a Directorate for e-health responsible for health system data gathering and management and providing health statistics reports in collaboration with relevant institutions such as the State Statistical Office and the Institute of Public Health. The Directorate also has authority to maintain a database of human resources working in the health sector, earlier a responsibility of the Institute of Public Health. With regards to human resources, the State Statistical Office is responsible for gathering and analysing data on human resources migration both within the health system and health workers migration.

3. DEFINING HUMAN RESOURCES FOR HEALTH

3.1. Background

In May 2014, the Sixty-seventh World Health Assembly adopted resolution WHA67.24 on Follow-up of the Recife Political Declaration on Human Resources for Health: renewed commitments towards universal health coverage. In paragraph 4(2) of that resolution, Member States requested the Director-General of the World Health Organization (WHO) to develop and submit a new global strategy for human resources for health (HRH) for consideration by the Sixty-ninth World Health Assembly. In March 2016 an UN High Level Commission on Health Employment and Economic Growth that proposed a five-year action plan (2016–21) for an expanded, transformed, interdependent and sustainable health workforce to accelerate inclusive economic growth and to ensure healthy lives, well-being, equity and economic security for all. Also in 2016, the Global strategy on human resources for health: workforce 2030[22] has been adopted, outlining outlines policy options for WHO Member States, responsibilities of the WHO Secretariat and recommendations for other stakeholders on how to: optimize the health workforce to accelerate progress towards UHC and the SDG (objective 1); understand and prepare for future needs of health systems, harnessing the rising demand in health labour markets to maximize job creation and economic growth (objective 2); build the institutional capacity to implement this agenda (objective 3); and strengthen the system on data collection and analysis on HRH for monitoring and ensuring accountability of implementation of both national strategies and the Global Strategy itself (objective 4).

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[22] WHO (2016). Global strategy on human resources for health: workforce 2030, available at: http://who.int/hrh/resources/globstrathrh-2030/en/

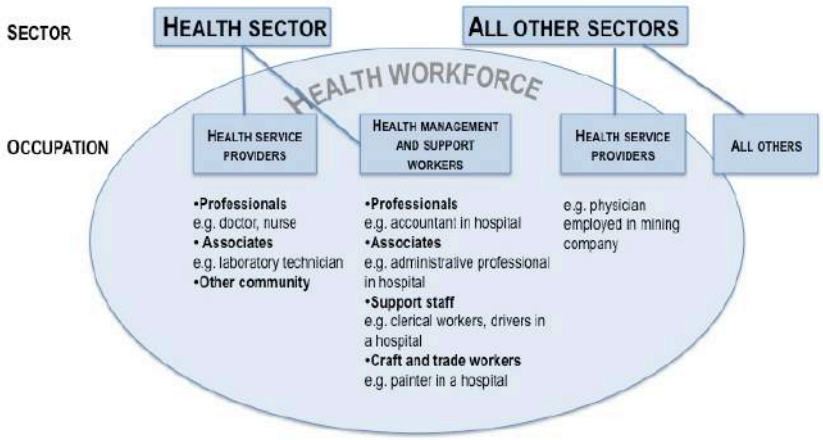
3.2. Defining human resources for health

A decade ago, the World Health Report defined the health workforce as "all people engaged in actions whose primary intent is to enhance health".[23] This defines the human resources for health beyond the WHO's definition of the health system or health sector thereof, as it involves a broader spectrum of sectors and professions whose primary goal, added benefit or simply implied impact is to improve health or to contribute to better health and wellbeing.

In addition, new challenges and increasing complexity of factors influencing health, including ageing population, new diseases as well as increasing burden of current diseases, violence, mental health and quality of life are just some in the array of issues to which the health workforce must be prepared to respond. It is thus, an unambiguous imperative to strengthen the workforce in intersectoral manner to the outmost benefit of the individual health, as well an achievement of national and global health goals. A strong human infrastructure is fundamental to closing today's gap between health promise and health reality in individual and population health and anticipating the health challenges of the 21st century.[24]

Having in mind that health is highly linked to other sectors, its appropriate to state that the health workforce scopes beyond those working in the health sector, and thus a more appropriate terminology to address the spectrum of human resources is human resources for health. In this way, the definition would also incorporate other professionals within or outside of the health sector, that are not providing health services, but with their activities they are influencing or contributing to health and wellbeing; for example, social workers, teachers, education and academic community, who also make important contributions and have critical role in either health improvement or acting upstream to ensure conditions and supportive environment for health promotion and disease prevention. Graphically, the scope of the human resources working for health is depicted in the figure below.

Figure 5. Health workforce across sectors



(Adapted from: World Health Report 2006)

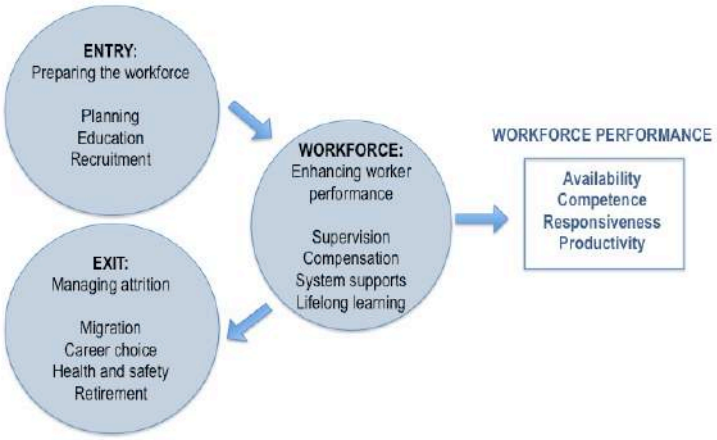
[23] WHO (2006). World Health Report 2006: Working Together for Health, WHO, Geneva
[24] WHO (2006). World Health Report 2006: Working Together for Health, WHO, Geneva

The WHO has categorized the health workforce according to three main groups of actors: (i) public health specialists, (ii) health professionals and (iii) non health-sector professionals.[25] Public health specialists include traditional public health occupations such as food safety and environment inspectors and other officials, communicable disease control staff, etc. This group also includes the 'new' practitioners working in the broad field of protection, prevention and promotion, such as those employed as municipality health promoters and those involved in health projects and programmes in the Healthy Cities and Health-Promoting Schools movements and other such initiatives. The group of health professionals includes personnel working in the health sector and providing health care services in all health system levels, primary, secondary, tertiary care, rehabilitation, as well as primary, secondary and tertiary prevention. This group, despite health workers, includes health care associates, laboratory personnel social workers, psychologists and others with or without clinical roles. The non-health sector group includes actors from other sectors whose activities and decisions have an impact on health, whether or not there is an explicit link. Examples include professionals at various levels of government (national, regional and local) who are implementing policies and managing programmes in non-health sectors, technical officers such as city planners, and housing, education, transport and other officials. For the non-health sector group, the task is to provide them with the understanding of how their activities and decisions have an impact on health, and how designing healthy policies can contribute to furthering the policy agendas in their own sectors as well as to the wider national development agenda.

Given the complex health challenges, emerging diseases and increasing health demands of the population, a wide range of competences and expertise is called for, including social epidemiology, information systems, health promotion, environmental health, management and leadership, and collaborative working.[26] Issues of interest in the HRH assessment range from entry points, including education and preparation of the workforce for performing its duties, continuing professional upgrade, ensuring appropriate and high-quality working conditions, providing clinical guidelines and standards, and establishing merit systems and mechanisms for measuring performance on individual level and outcomes at population level. The figures below describe the elements that need to be taken into account when considering the human resources for health development and utilisation pathways (Figure 6) and the policy levers that shape the human resources for health market (Figure 7).

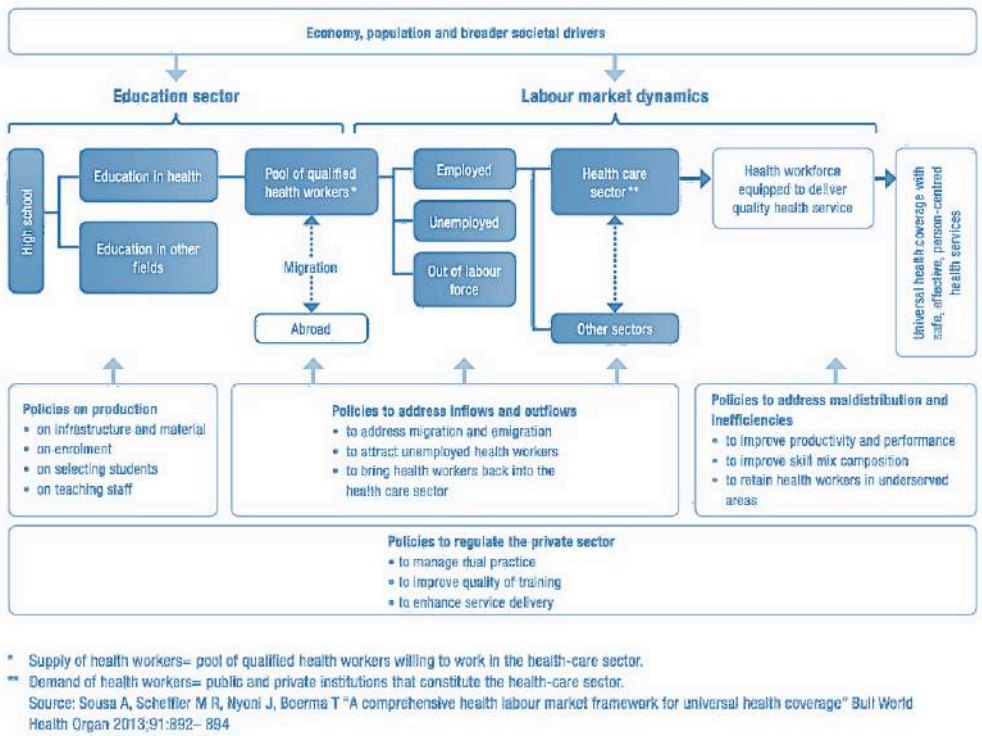
[25] WHO EURO (2012). European Action Plan for Strengthening Public Health Capacities and Services, avaliable at: http://www.euro.who.int/__data/assets/pdf_file/0005/171770/RC62wd12rev1-Eng.pdf
[26] WHO EURO (2012). European Action Plan for Strengthening Public Health Capacities and Services, avaliable at: http://www.euro.who.int/__data/assets/pdf_file/0005/171770/RC62wd12rev1-Eng.pdf

Figure 6. Human resources for health development patterns



(Adapted from: World Health Report 2006)

Figure 7. Policy levers to shape health labour markets



(Source: Global strategy on human resources for health: Workforce 2030)

As shown in the Figure above, the foundation for a strong and effective health workforce, able to respond to the 21st century priorities, requires matching effectively the supply and skills of health workers to population needs, now and in the future. Attaining the necessary quantity, quality and relevance of the health workforce will require that policy and funding decisions on both the education and health labour market are aligned with these evolving needs.[27]

[27] WHO (2016). Global strategy on human resources for health: workforce 2030: http://who.int/hrh/resources/globstrathrh-2030/en/

4. SITUATION ANALYSIS OF HUMAN RESOURCES IN HEALTH

4.1. Health workforce stock and trends

As described above, the workforce in the health sector constitutes: health professionals, public health specialists and health associates working at all levels of care; health professionals include doctors, dentists, pharmacists, nurses and medical technicians, whereas health associates includes a variety of professions such as laboratory staff, social workers, speech impairment specialists and so forth. Other auxiliary professions in healthcare are the administrative and clerical ones, which are also very important to smooth functioning of the system.

The total number of workforce employed in the healthcare sector in 2010 was 26985 persons, of which 22005 were health professionals and 4980 non-medical staff. Across both the private and public sectors, in 2013 health services were provided by 5804 physicians, 1705 dentists, 930 pharmacists, 1888 health associates, 13176 medical personnel with medical college or high school, 345 personnel with lower educational qualifications and 4816 administrative and technical staff.[28]

In EU, about 6% of the total workforce of those employed, are in the health care system.[29] Trends in supply of health care professionals vary among the different health professions, based on the health needs of the population. Overall, according to the national statistics, the number of medical doctors, dentists and pharmacists in the country shows a slow but steady increase between 1990 and 2013, from 5,998 to 8,439 persons.[30] In this period the proportion of physicians in Macedonia (2.8 per 1,000 population in 2013) has reached the EU 13 average (2.8 per 1,000 population) and is similar to that of Croatia (3.0), but still well below the EU15 average (3.6) and some other countries in the region in 2013. The number of physicians and specialist physicians varies across the regions. In primary care, the number of physicians per 1,000 insured persons varies between 0.75 in Eastern region to 0.99 in Northeast region.[31]

Table 3. Active health workforce per 1000 population at national level, 1990 to 2013

	1990	1995	2000	2005	2011	2013
Physicians	2.17	2.30	2.20	2.16	2.74	2.80
Specialist physicians	0.77	0.75	0.77	0.83	0.77	n/a
Nurses	n/a	n/a	3.58	3.44	4.21	4.21
Midwives	0.73	0.75	0.71	0.65	0.58	0.55
Dentists	0.55	0.55	0.56	0.68	0.79	0.6
Pharmacists	0.18	0.18	0.15	0.43	0.38	0.4

(Note: headcount; Source: WHO Regional Office for Europe, 2014)

[28] State Statistical Office (2015). Statistical Yearbook 2014
[29] European Commission (2012). EU level Collaboration on Forecasting Health Workforce Needs, Workforce Planning and Health Workforce Trends – A Feasibility Study, avaliable at: http://ec.europa.eu/health/workforce/docs/health_wo6%%20of%20the%20total%20workforcerkforce_study_2012_appendices_en.pdf
[30] State Statistical Office (2015). Statistical Yearbook 2014
[31] HIF (2016). Annual Report 2015

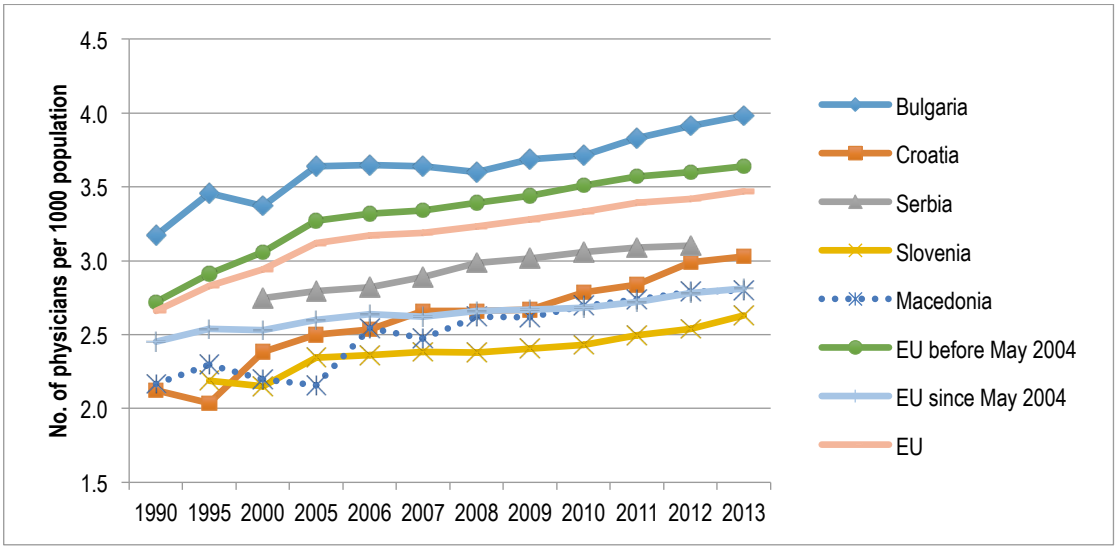
Table 4. Active health workforce by occupational categories, 1991-2014

	Health care workers			
	Physicians		Dentists	Pharmacists
Census year	Total	Specialists		
1991	4 487	2 296	1 118	393
1992	4 564	2 525	1 078	414
1993	4 528	2 605	1 078	358
1994	4 505	2 683	1 087	357
1995	4 516	2 730	1 086	349
1996	4 464	2 732	1 078	342
1997	4 491	2 773	1 089	335
1998	4 508	2 782	1 144	329
1999	4 449	2 801	1 128	317
2000	4 455	2 892	1 129	311
2001	4 459	2 894	1 125	309
2002	4 573	2 954	1 183	322
2003	4 448	2 951	1 132	319
2004	4 490	3 025	1 134	322
2005	4 392	3 052	706	205
2006	5 134	3 301	1 175	187
2007	5 052	3 348	1 310	571
2008	5 364	3 477	1 381	649
2009	5 364	3 460	1 425	680
2010	5 541	3 580	1 599	692
2011	5 649	3 564	1 622	782
2012	5 755	3 554	1 652	888
2013	5 804	3604	1 705	930
2014	6 035	3699	1 762	1 002

(Note: headcount; Source: State Statistical Office, 2016)

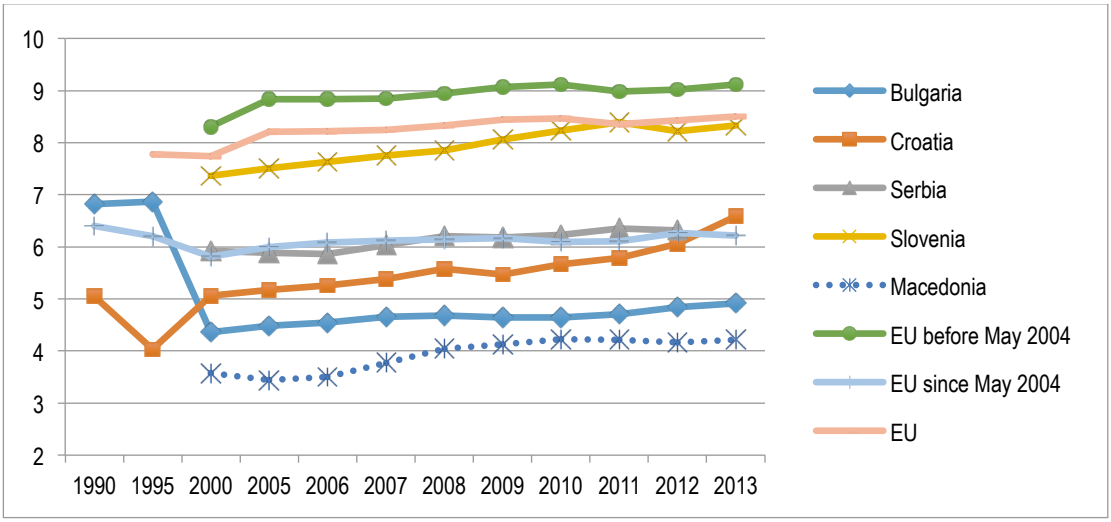
The distribution in Table 4 is presented only for professions with higher level of education, while data for health personnel with low and middle level of education (nurses, technicians, midwifes) are not available.

Figure 8. Number of physicians per 1000 population in Macedonia and selected countries, 1990 to 2013



Source: WHO Regional Office for Europe, 2016
* Serbia 2000 is from 2003, Slovenia 1995 is from 1998

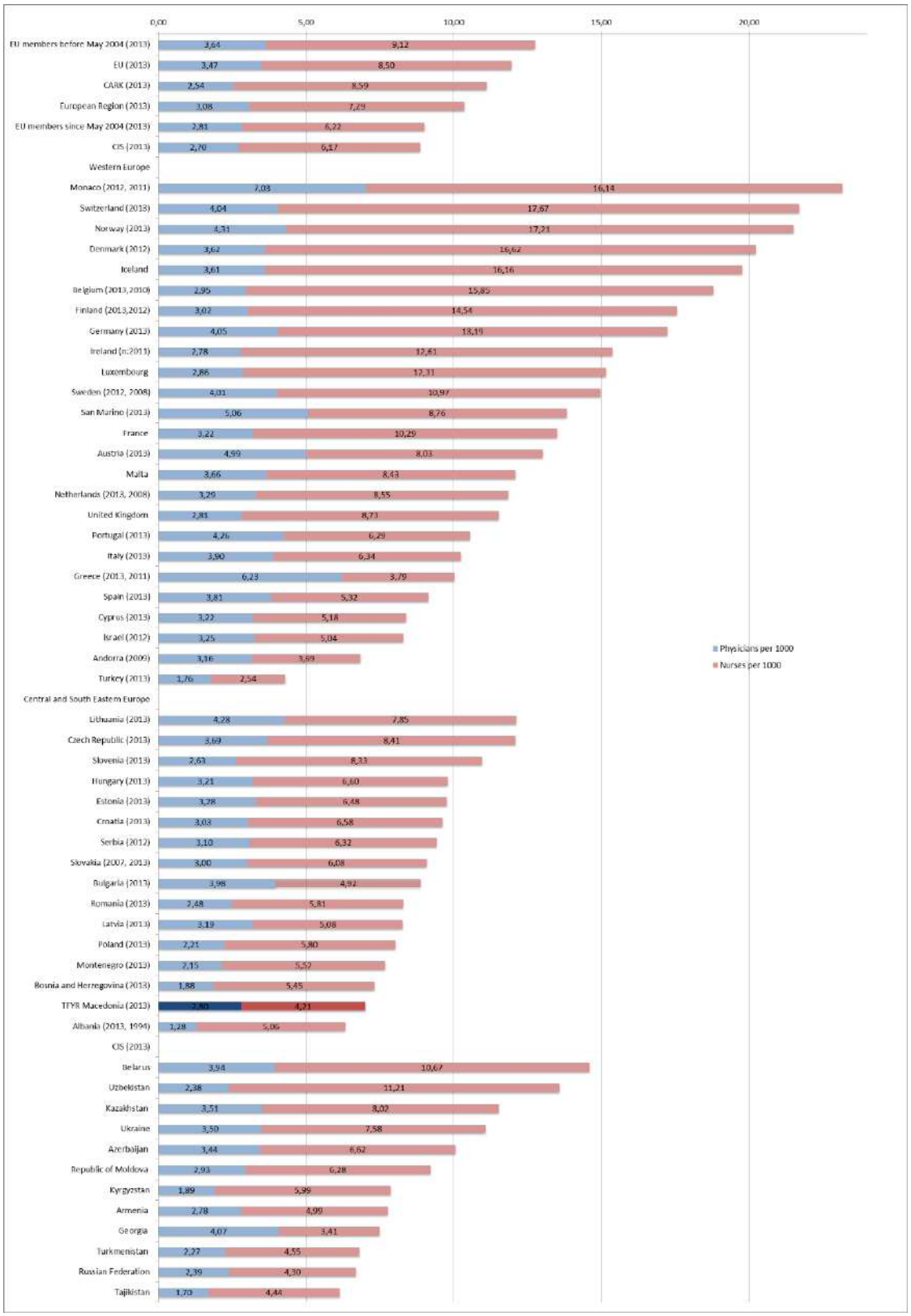
Figure 9. Number of nurses per 1000 population in Macedonia and selected countries, 1990 to 2013



(Source: WHO Regional Office for Europe, 2016)
* Serbia 2000 is from 2003, Slovenia 2000 is from 2003, EU 1995 is from 1998

The nurse-to-population ratio increased slowly from 2005 to 2010 and stayed steady at 4.21 per 1000 population until 2013, but remains well below the European average and other countries in the region (Figure 9). The number of community patronage nurses has increased from 278 in 2011 to 357 in 2013, based on a comprehensive study with equity analysis undertaken in 2011 (UNICEF, 2012). While the ratio of nurses to population has slightly increased, the number of midwives per 1000 population decreased considerably from 0.73 in 1990 to 0.55 in 2013 (Table 3). The numbers of physicians and nurses per 1000 population is higher than Albania and Turkey and comparable to those of Bosnia and Herzegovina, and some EU 13 countries (Romania and Poland), however still far below Western European countries and the average of the European region.

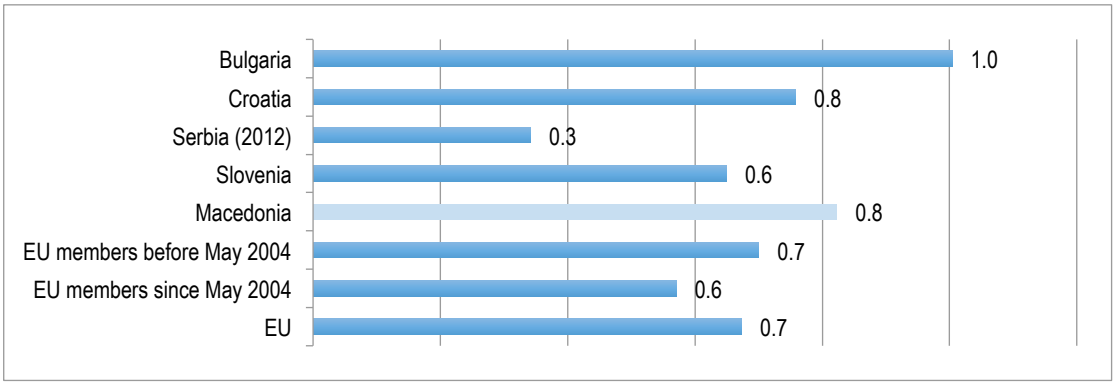
Figure 10. Number of physicians and nurses per 1000 population in the WHO European Region, 2014 (or latest available year)



Source: WHO Regional Office for Europe - Health for All Database, 2016 (Source: Milevska-Kostova et al 2017)
Notes: EU: European Union; CARK: Central Asian Republics and Kazakhstan; CIS: Commonwealth of Independent States

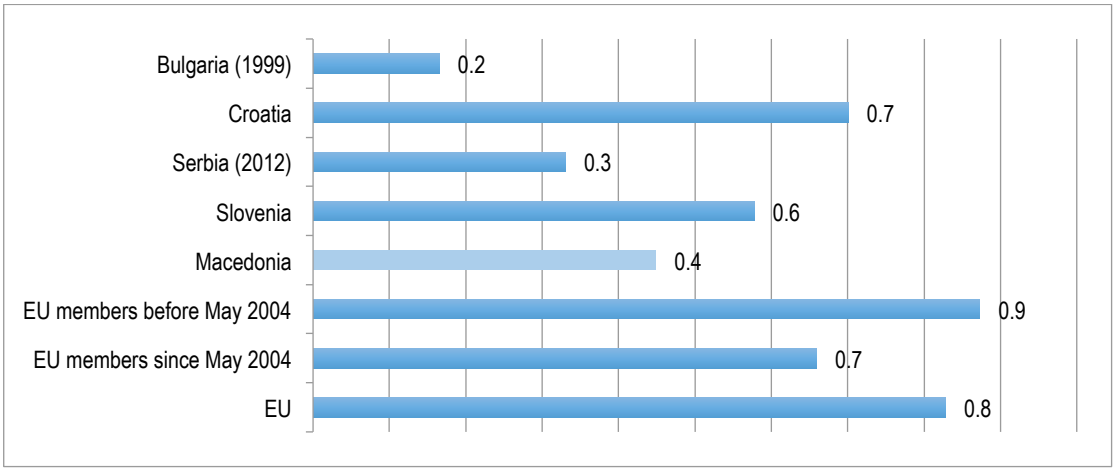
The availability of dentists per 1000 population was well above the EU13 average and slightly above the EU15 average in 2013, while the number of pharmacists per 1000 population is much less (0.4) than the European averages.

Figure 11. Number of dentists per 1000 population in Macedonia and selected countries, 2013 (or latest available year)



(Source: WHO Regional Office for Europe - Health for All Database, 2016)
*Serbia 2013 is from 2012

Figure 12. Number of pharmacists per 1000 population in Macedonia and selected countries, 2013 (or latest available year)



(Source: WHO Regional Office for Europe - Health for All Database, 2016)
* Bulgaria from 1999 (1st year of data), Serbia is from 2012

4.2. Distribution of health workforce

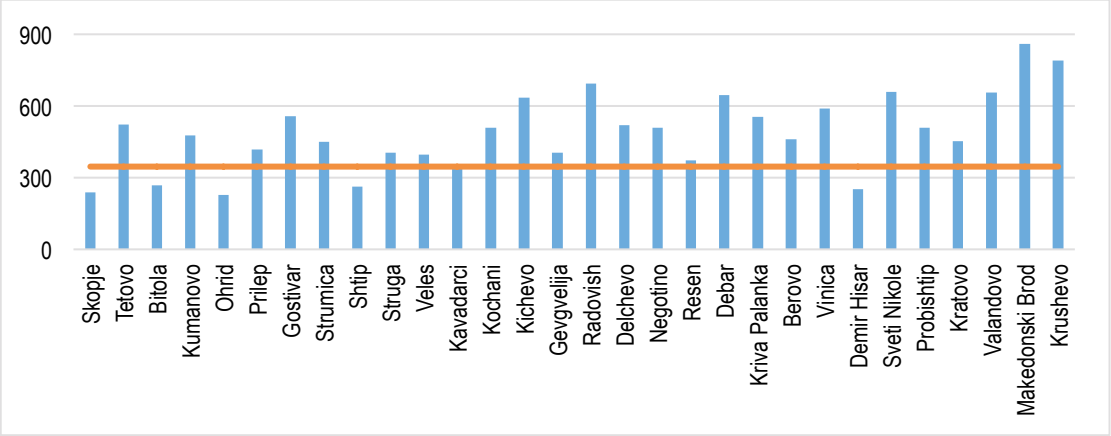
4.2.1. Geographic distribution

According to the indicators of density of doctors the country has a developed network of geographically well-distributed healthcare facilities at preventive, primary and secondary health care; the tertiary care is concentrated in the capital city of Skopje. However, the distribution of human resources is uneven and fluctuating, due to different reasons.

The process of transformation of the primary health care from public to private (during 2005 to 2007) included transfer of primary care physicians in general practice, gynaecology and dentistry from public into private practice while obtaining their function in the public-health system with signing contracts for provision of services with the Health Insurance Fund. The regional distribution of primary care providers is given in the following tables.

The total number of doctors in the country is 5975, or in ratio with the population on country level there is 346.5 population per doctor. The highest is the ratio of 860.3 in Makedonski Brod and Krushevo with 791.8 due to the small size of these areas. The smallest ratio, or region with most doctors per population is Ohrid with ratio of 228.9 due to several special hospitals that are located in this region. Second region with lowest ratio is the capital Skopje with 239.2 were the tertiary level of care is located.

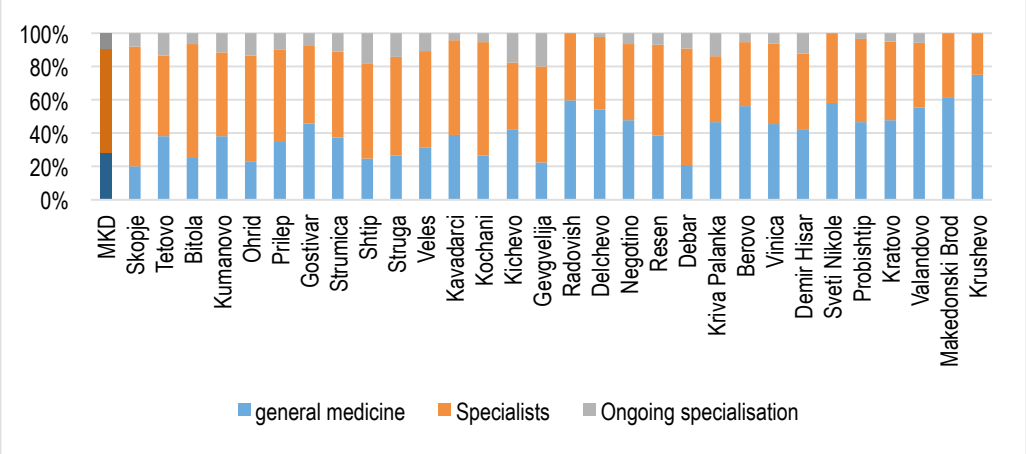
Figure 13. Population per doctor, by health regions in Macedonia, 2015



(Source: Institute of Public Health 2015)

There is a trend in developed countries of change in the balance between specialists and general practitioners with the specialists increasing at the expense of the GPs, alarming about the possible shortages in the primary care level. In OECD countries, the share of GPs is 29%, while in Macedonia the share of GPs is 28.6% or close to the OECD average.

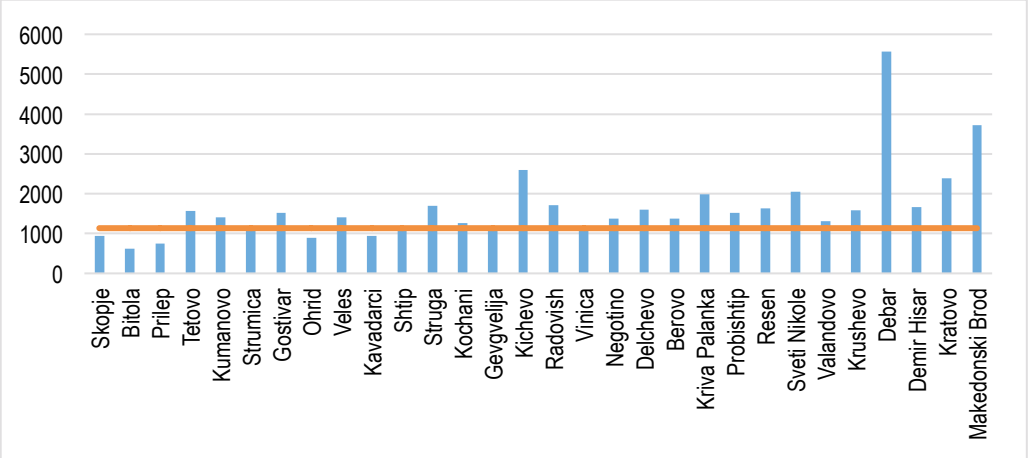
Figure 14. Doctors by specialization level, by health regions in Macedonia, 2015



(Source: Institute of Public Health 2015)

There are 1824 dentists in the country that according to **Figure 15** are well distributed across the country regarding the population in the regions. The average population per dentist is 1135; in Debar one dentist covers 5562.8 inhabitants and Makedonski Brod – 3728 inhabitants per dentist. The highest number of dentist per population is registered in Bitola with 624.2 population per dentist and Prilep with 749.6. The capital city of Skopje although has the highest absolute number of dentists (representing 36% of all dentists) in the country, the ratio is 936.9 population per dentist which is lower than the country average.

Figure 15. Population per dentist, by health regions in Macedonia, 2015

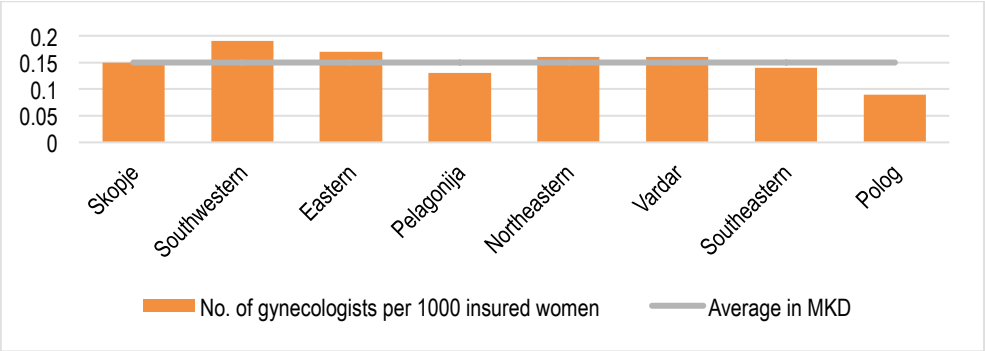


(Source: Institute of Public Health, 2015)

One of most deficient types of health professionals are gynaecologists with total number of 332 specialists, out of which only 138 are working at primary level under the health insurance contract with the HIF. In 35 municipalities there is no gynaecologist at primary level and in 29 municipalities the

number is under the minimum standard (ESE). The national average stands at 0.15 gynaecologists at primary level per 1000 insured women. The highest ratio is in the Southwestern statistical region of 0.19 doctors per 1000 women, and the lowest is the ratio of 0.09 gynaecologists in the Polog region. The capital with 47 gynaecologists is at the level of the country average.

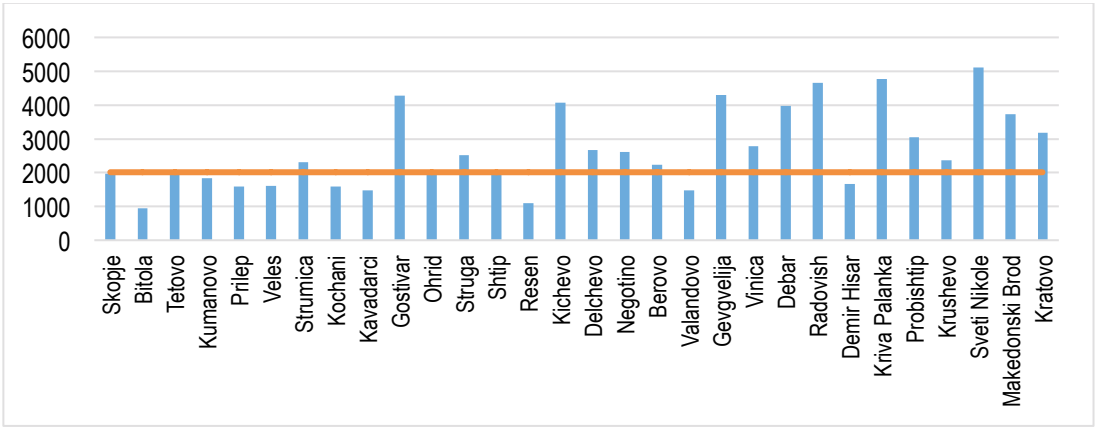
Figure 16. Gynaecologists per 1000 insured women, by statistical region, 2015



(Source: 2015 HIFM Annual report, 2016)

In 2015, the total number of pharmacists in the country was 1029 or on average one pharmacist serving 2011.9 inhabitants. The highest ratio was registered in Sveti Nikole (5110.8 inhabitants per pharmacist) and Kriva Palanka (4770). The highest relative density of pharmacists was in Bitola health region (950.9 inhabitants per pharmacist) and Resen health region (1090.1). In the capital, the ratio of 1966 inhabitants per pharmacist was close to the country average.

Figure 17. Population per pharmacist, by health region, 2015



(Source: 2015 HIF Annual Report, 2016)

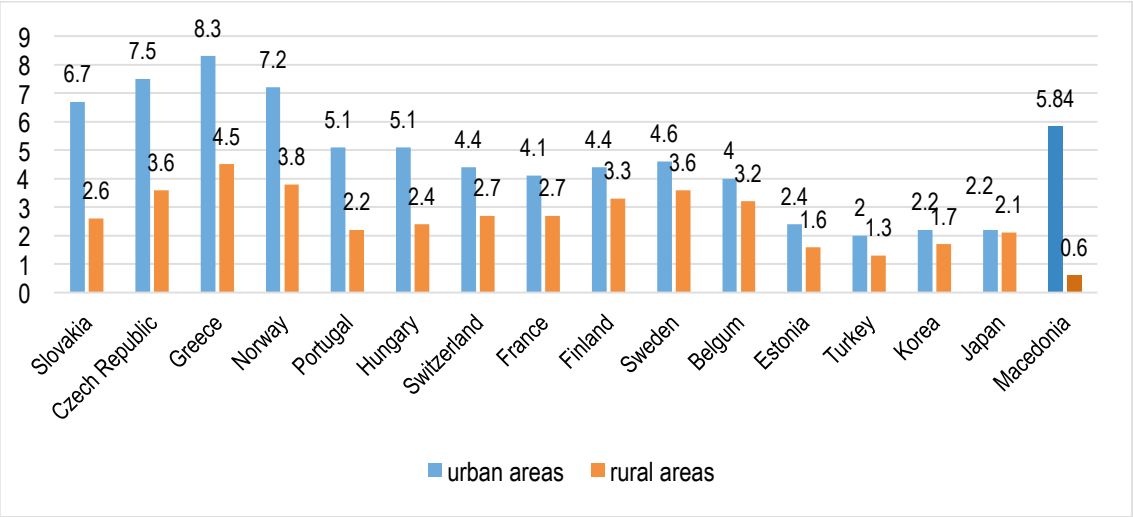
Regarding emergency care, the emergency care units are geographically evenly distributed throughout the country, regardless whether the service is cost-effective in a given region. In 2013, the 24/7 emergency care units had 252 full-time medical teams consisting of a physician and nurse, working as

part of the 23 Health Centres. But there are still challenges for a complete response to the emergency care needs, especially in the lack of personnel and equipment in the capital, and reaching some of the mountain rural areas because of distance and inaccessibility of the terrain.

4.2.2. Urban/rural distribution

Access to medical care requires a sufficient number and well distributed personnel across the country. Macedonia compared to bigger in territory, more populated and more developed OECD countries in **Figure 18** has a relatively low number of physicians in the rural areas of only 0.6 per 1000 population. The highest density in rural areas of the countries presented in the figure is in Greece with 4.5 physicians per 1000 population.

Figure 18. Physicians' density per 1000 population in predominantly urban and rural regions, selected countries, 2013 (or latest available year)



Note: The classification of urban and rural regions varies across countries.
Sources: OECD Regions at a Glance 2015
HIF doctors code list, accessed March 2017

In 2014, the government initiated the project "Rural doctor", aimed at providing access to persons who are not able to obtain medical care and health services at their place of living.

The rural doctor has the following responsibilities:

- Examinations of patients in outpatient care in the health centres as well as at home;
- Preventive measures and activities defined in the programs for health promotion;
- Prescribes therapy from the Positive medicines list in the primary healthcare;
- Provides services at primary care, i.e. taking blood samples, and administration of ampule (IV, IM, SC) therapy etc.

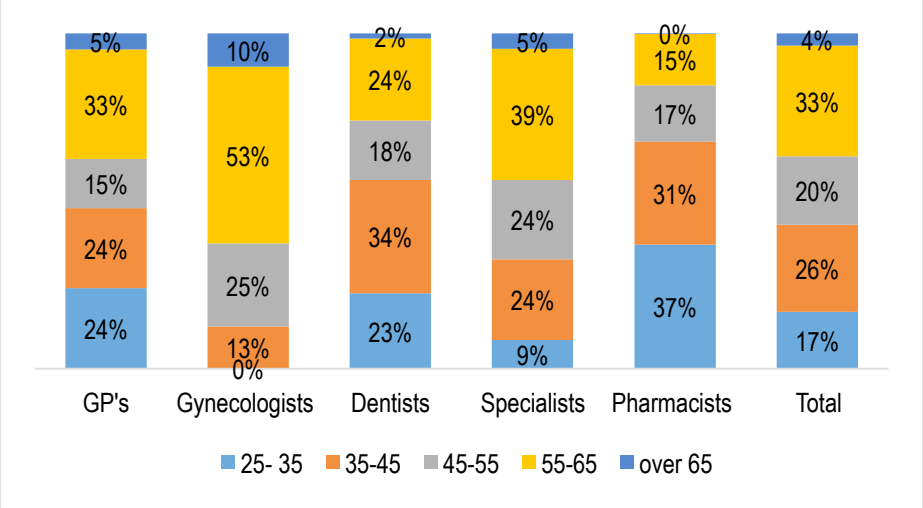
The benefits and challenges of this program have not yet been assessed.

4.2.3. Age and gender distribution

Beside the numbers and distribution of medical personnel, the age and gender structure of the personnel has an important influence on the supply of medical services to the population. There are two major trends in developed countries concerning these demographic characteristics of the health workforce - one being the aging and second the 'feminisation' of the medical profession. In OECD countries the share of doctors above 55 years has raised from one fifth in 2000 to one third in 2013. Macedonia with 37% of medical personnel above 55 has older age structure then the OECD average. Although this portion of health personnel is expected to retire in the next 10 years, the number of doctors working after the retirement age is growing. Macedonia as many other countries with pension reforms and motivation measures is trying to postpone the replacement needs for doctors in the country. In 2017, there are 741 or 8.6% of the total university educated medical personnel that are working after fulfilling the age criteria for retirement (in MKD – 62 years for women, and 64 years for men).

Most concerning is the age structure of gynaecologists at primary level were 63% are older than 55, and among gynaecology specialists at secondary and tertiary level were 44% are over this age level. This is further aggravated with the fact that gynaecologists are already a deficient specialty across all levels of care.

Figure 19. Age structure of university-educated health workforce in Macedonia, 2017

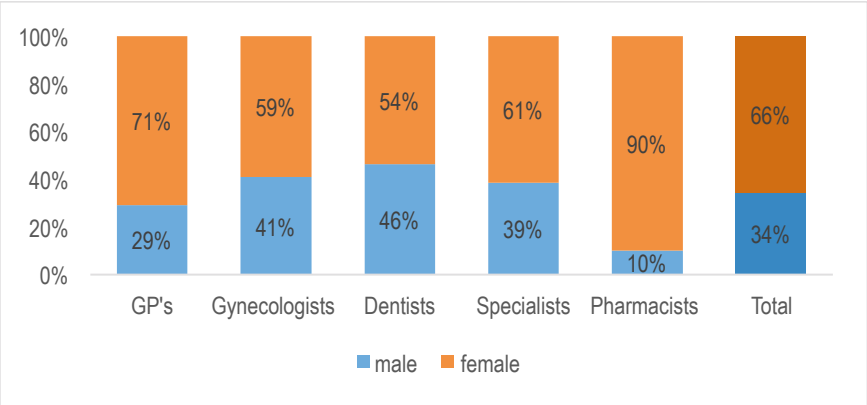


(Note: Health workforce in HIF-contracted health institutions; Source: HIF, 2017)

The rise of proportion of female doctors may affect the overall supply of health services, as women tend to work fewer hours than men, although working hours preferences are becoming more similar among newer generations of doctors.[32]

[32] OECD (2015), Health at glance 2015,

Figure 20. Gender structure of university-educated health workforce in Macedonia, 2017



(Note: Health workforce in HIF-contracted health institutions; Source: HIF, 2017)

The share of female doctors working in OECD countries was 45% in 2013, an increase from 29% in 1990 and 38% in 2000. In Macedonia, in 2017, women constitute 66% of the university-educated health personnel, and 62% of the medical doctors. The highest gender imbalance is seen among pharmacists where 90% of these professionals are women (Figure 20).

4.3. Remuneration and incentives of health workforce

4.3.1. Payment mechanisms

The health finance system relies on several finance mechanisms, based on the level of health care and types of services. The following table provides an overview of these mechanisms.

Table 5. Provider payment mechanisms

Payers / Providers	HIF	MoH	MLSP	Cost sharing	Direct payments
Primary healthcare	C + Preventive goals (P4P)				
Ambulatory specialists	GB/capped FFS			Up to 20% on some services*	100% by uninsured, or without referral
Other ambulatory	GB/capped FFS				
General (acute) hospitals	GB/DRG + P4P				
Clinical and specialized hospitals	DRG/service groups + P4P (conditional budgets)				
Dentists	C + FFS				
Pharmacies	Reimbursement			Up to 20% on some medicines*	Medicines not on positive list, OTCs, other
Public health services	Through preventive/public health packages	Through health programs			
Social care			S		

Source: Milevska Kostova et al 2017

Notes: C= capitation; DRG= diagnosis-related groups; FFS=fee-for-service; GB = global budgets: P4P= pay for performance; S= social transfers

HIF is the sole purchaser of health services, and concludes contracts with providers at the primary, secondary and tertiary level, both in public and private domain. Prices of health services purchased by the HIF are unified for public and private health institutions. In 2015, 61% of the health services expenditures were for health services purchased from public sector and 37% for services from private health sector.

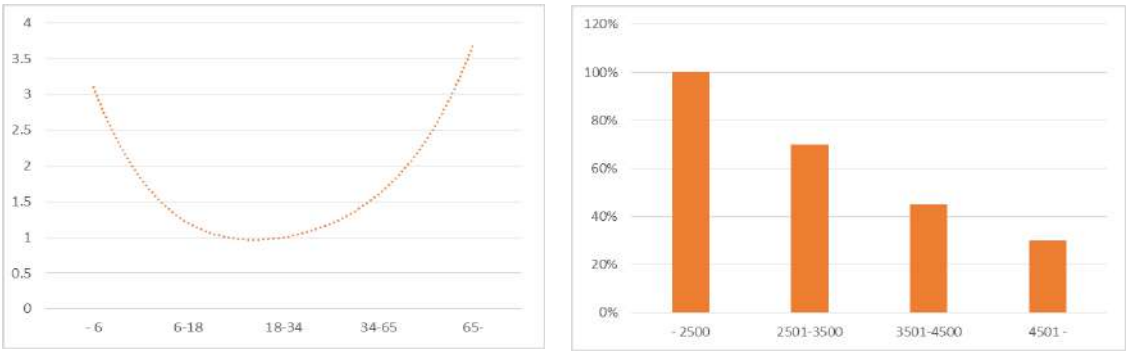
The primary health care entails 31.96% of the health services and includes the general practitioners (GPs), dentists, gynaecologists, paediatricians and community pharmacies at primary level.

The capitation calculation is adjusted by patient's age, total number of patients in GP's roster and the fulfilment of preventive goals assigned to the GP in specified time period. Thus, GPs are financed through mixed model of capitation as fixed part (70%) and variable part paid based on performance (30%) on fulfilment of predefined preventive goals. Beside the capitation, the dentists also have the option of charging co-payments defined by the HIF.

The fixed part of the capitation is calculated on the number of patients in doctor's roster that is adjusted on the total calculated points. Doctors with up to 2500 points receive 100% of the capitation, for the part of 2500 to 3500 points receive 70% of the value, for the part of 3500-4500 receive 45% of the value, and for more than 4500 points, 30% of the value of the capitation. This scale is implemented in order to prevent over enrolling patients that can have negative effect on the quality of care and the time that the GP can dedicate to each patient. The number of points is calculated and adjusted based on several criteria, of which patients' age is most relevant.

Based on the patients' age, the value of the capitation is adjusted with coefficients that are higher for younger ages (3) and population above 65 (3.5), whereas lower for working age population (1). Such age adjustment coefficients are aligned with the diseases that are occurring at different stages in life concordant with the volume of health services, and consequently the engagement of doctor for different age groups of patients.

Figure 21. Capitation calculation



(Source: HIFM Annual Report 2015)

The value of the capitation point for general practitioners is 55 MKD, for gynaecologists 50 MKD, and for dentists 50 MKD, which in 2016, was increased by 5 MKD for GPs and dentists.

In 2015, (before the increase) the average monthly capitation per GP was 101,269 MKD, per gynaecologist 159,390 MKD and per dentist 37,199 MKD. This amount is used to cover medical supplies, administrative costs (including rent and utilities), and salaries of the doctor and additional staff, i.e. nurse or technician.

Given the lack of doctors at primary level, and the already mentioned ageing factor, in 2014, an incentive for new doctors to join the system was introduced in a form of starting capitation of 40,000 MKD for the first 18 months of their contract with the HIF; this period is revised based on the performance of the doctor, i.e. it is ceased if the doctors' roster reaches the average size earlier.

In 2010, the HIF also created packages for the preventive and public health services in the 34 health centres for the emergency medical care, immunisation, patronage nurse home visits, post-hospital home visits, consultations and systematic medical examinations.

The ambulatory health care constitutes 30% of all health services provided through the HIF, and is dominantly provided by public providers (87%), and small portion by private providers (13%). With regards to the overall health services provided through HIF in the publicly owned hospitals, approximately 40% are acute health services, 10% services for chronic illnesses, 30% for ambulatory services and 20% for other services, including emergency medical services, consultations, patronage nursing and home visits to patients, provided by the health centres.

Specialist-consultative (outpatient) health services provided by private health institutions are funded through global budgets that are calculated based on the number of medical teams in the respective institution. Beside the HIF payments, these institutions gain revenues from patients' co-payments or other services.

The average monthly revenues of the private specialists teams from the HIF in 2015 were:

Table 6. Specialists average monthly funds from the HIF, 2015

Type of specialist	Amount per team (MKD)
Specialists	97,222
Dental Specialists	
Prosthetics	90,000
Oral surgery	90,000
Orthodontics	97,000
Laboratory	74,238

(Source: 2015 HIFM Annual Report, 2016)

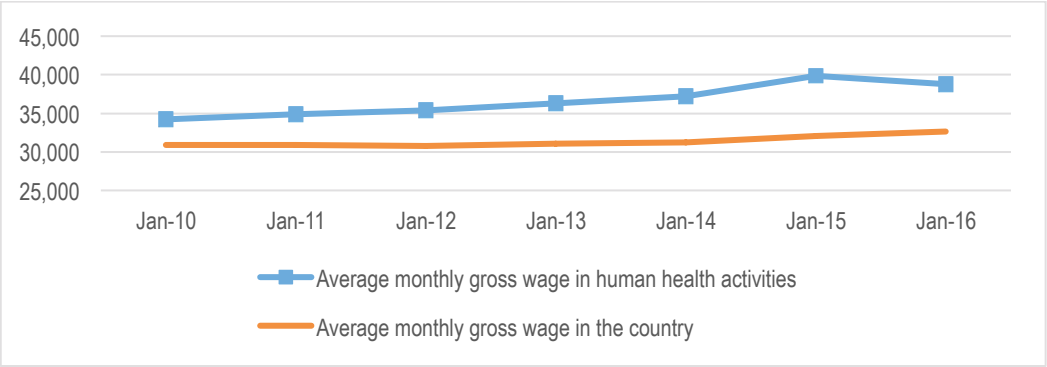
Ministry of Education and Science covers the costs for the teaching staff in medical schools and faculties and scientific research.

Payment mechanisms for hospitals have changed over the past several years. Diagnoses Related Groups (DRG) system of payment for hospital services and outpatient packages were introduced in 2008. Many services, such as critical care, long term mental care, rehabilitation and ambulance services were excluded from the DRG. Therefore, in mid 2010 the Health Insurance Fund introduced the ambulatory groups of health services to record the outpatient services in the hospitals. In 2011, the HIF introduced conditional budgeting as a separate part of the public health institutions budgets, which are dedicated to services that are significant for the system (transplantations, expensive treatments and medicines etc.) In 2012, HIF introduced different hospital packages of services which are not included in the DRG, such as chronic mental disorders and chronic care.

4.3.2. Financing health workforce

According to the State Statistical Office, the average gross wage for health workforce in January 2016 was 38.820 MKD, or 19% higher than the average monthly gross salary in the country for all professions (SSO, 2016).

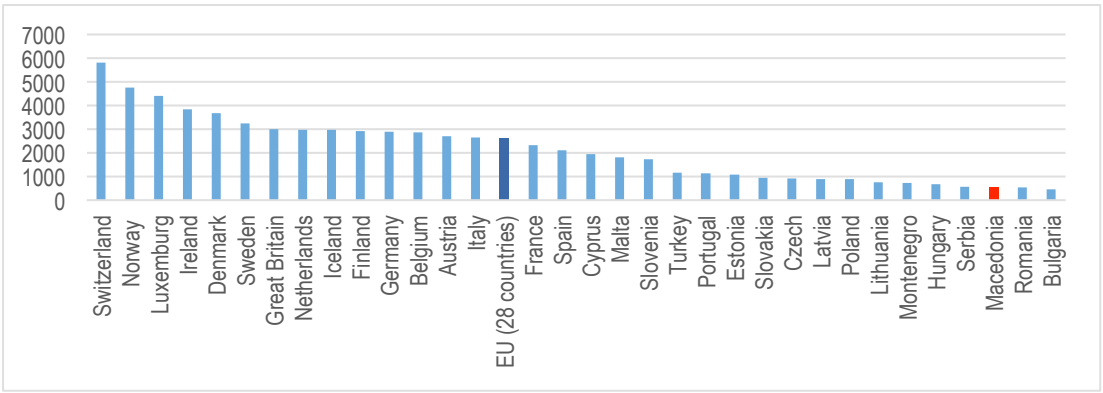
Figure 22. Average monthly gross wage for health workforce and overall, 2010 to 2016



(Source: State statistical office, 2016, News releases on average monthly gross wage per employee)

In the past 7 years, the average salary for health workforce has increased by 13.5%, which is double the growth of the average salary in the country (5.7%) for the same period.

Figure 23. Average monthly wage in health and social care in 2014, selected countries



(Source: Eurostat, Structure of earning survey 2014)

Comparing the average wage in health and social care to EU countries, in 2014 Macedonia was in the far right on the figure, with average wage of 557 €, together with Romania (533 €) and Bulgaria (456 €). On the other side were Switzerland with the highest average wage of 5,817 € (or 10.5 times higher than Macedonia), and Norway with average wage of 4,759 €. The average salary in health and social care in the European Union was 2,612 €, or nearly 5 times higher than the average wage in these sectors in Macedonia.

In primary health care, the level of wages is strongly linked to the received capitation.

The wages of other health and administrative personnel in the public sector are regulated with a collective agreement for health care, while in private sector wages are defined through individual employment contracts. The collective agreement for health care defines minimal wages adjusted for different complexity level, such as level of education, post and working conditions, using predefined coefficients.

The minimal wage is regulated with a settlement between the trade union and the Ministry of Health, based on living standard, potentials of the economy, wage levels in the country in general, productivity, social transfers and other economic and social factors.

According to the latest amendments to the Collective agreement[33] and Settlement for defining lowest level of complexity, calculation and payment of wages in health sector,[34] the basic wages for health personnel are:

Table 7. Minimal wages in public sector, 2016

	Primary and secondary institutions	Clinics
Doctor, Dentist, Pharmacist	38,380 MKD	
Specialist	50,451 MKD	57,728 MKD
Sub-specialist	51,097 MKD	63,359 MKD
Nurse, technician	23,878 MKD	

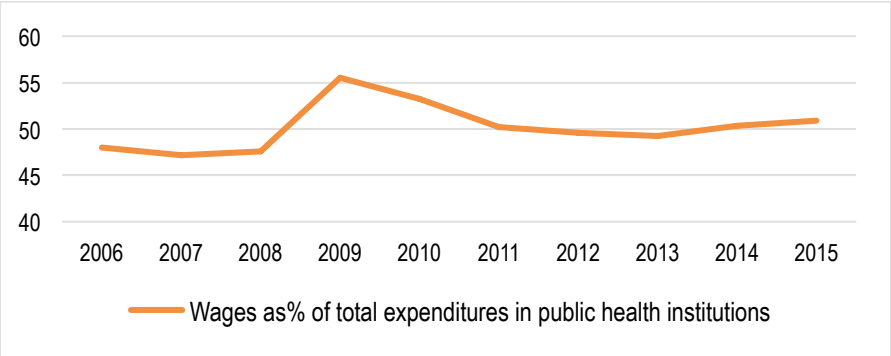
(Source: Collective agreement for health care, 2016)

Starting from July 2012, the Ministry of Health introduced the pay-for-performance system for specialists in the public domain health institutions in secondary and tertiary care, intended to improve resource use efficiency. Thereof, salaries are calculated based on data entered at individual and department level, with possibility of fluctuation of 20% depending on the performance. As an incentive, doctors with highest number of interventions at national level receive one full monthly salary as a bonus.

The system is based on mandatory reporting of every procedure in the software that measures individual physician's workload. However, besides the input, in terms of volume of services registered, the system does not measure other parameters of the performance, such as quality, teamwork, complexity of cases, or outputs of the physician's work, such as improved health outcomes (Lazarevik et al 2013).

[33] Official Gazette of the Republic of Macedonia No.75, 15.04.2016
[34] Official Gazette of the Republic of Macedonia No.158, 30.10.2016

Figure 24. Wages as share of total expenditures in public sector, 2006-2015



(Source: HIF, Monthly reports of budget execution of HIF and Public health institutions)

In public health institutions' budgets, between 2006 and 2015, the share of wages was around 50% of the total expenditures, with exception to 2009 (56%).

5. HRH PRODUCTION

5.1. Pre-service training

5.1.1. National and sub-national capacity

Health professions' education is regulated by law. Higher education is under the authority of the Ministry of Education and Science, and post-university continuous education and specializations are within the authority of the Ministry of Health. In 2013, a new Law on medical studies and continuous medical education was passed, which has given further authority to the Ministry of Health to also conduct studies, mainly for medical doctors. Continuing medical education (CME), previously the responsibility of the Ministry of Health, has been delegated to the professional chambers (medical, dental and pharmaceutical), which are also responsible for licensing and re-licensing of professionals. EU legislation, such as the Directive on the Recognition of Professional Qualifications (Directive 2005/36/EC) has been ratified, but the process of harmonizing national legislation is still ongoing. All of the higher education programs in the country are aligned with the Bologna Declaration for higher education.

The number of faculties in medicine, dentistry and pharmacy has increased since mid-2005. Students can obtain their medical doctor degree at three faculties of medicine in the Republic of Macedonia, in Skopje, Shtip and Tetovo. Two Faculties of Dentistry are available at universities in Skopje, and one each at the universities in Tetovo and Shtip. Three faculties of pharmacy are located at the universities in Skopje, Shtip and Tetovo. University-level nursing studies are available at four medical colleges in Skopje, Tetovo, Shtip and Bitola, offering studies in nursing, midwives, optometrists, dental technicians, physiotherapy, radiology techniques etc. Specializations and sub- specializations in most medical and pharmaceutical fields are available from all faculties, and students are enrolled based on predefined quota for each specialty. Since 2010, completing a specialty includes the requirement of having performed a minimum number of interventions in the respective field.

Table 8. Number of tertiary training institutions by type of ownership, 2015

Type of training institution	Type of ownership			Total
	Public	Private not for profit	Private for Profit	
Medicine	3	0	0	**3**
Dentistry	1	0	1	**2**
Pharmacy	2	0	0	**2**
Nursing & Midwifery	3	0	0	**3**
Health sciences	0	0	0	**0**
Environment & public health	1	0	0	**1**
Total	**10**	**0**	**1**	**11**

Table 9. Students in public and private tertiary education institutions, 2013

Tertiary education institutions	No. of students 2012/2013	Graduated students, 2013
Public tertiary institutions		
Medical Colleges		
Medical College - Bitola	787	92
Medical College - Shtip	-	
Medical College - Skopje		
University "Ss. Cyril and Methodius" - Skopje		
Faculty of Medicine	1,650	213
Faculty of Dentistry	509	109
Faculty of Pharmacy	556	73
University "Goce Delchev" - Shtip		
Faculty of Medical Sciences	1,857	143
State University - Tetovo		
Faculty of Medical Sciences	574	149
Private tertiary institutions		
European University - Skopje		
Faculty of Dentistry	63	13

(Source: Healthgrouper 2014)

According to the data in Table 9, in 2013 there were 505 medical graduates or 24 graduates per 100.000 population which is significantly higher than the OECD average of 11.5, for the same year.

The secondary medical education is available in 10 medical high schools across the country, of which one in the capital city of Skopje, and others in bigger towns, including Tetovo, Bitola, Shtip, Strumica and so forth. The post-secondary education is available as medical college education (in Skopje, Shtip, Tetovo and Bitola) and tertiary education (Skopje, Shtip and Tetovo).

5.1.2. Undergraduate studies in medical sciences

The duration of medical education at undergraduate level is six years, including five years of theoretical training and one year of practice on a rotation principle between different specialties, such as internal medicine, surgery, gynaecology, public health etc. The primary care reforms also changed the curriculum by including 30-hours of family medicine in the fifth year, taught at the Medical Faculty's Centre for Family Medicine that opened in 2010 and provides an interdisciplinary specialization in family medicine. After completing their residency and final state exam, doctors need to register with the Medical Chamber to obtain a certificate of professional qualification and practicing license.

Dentistry is taught over a five-year course with 6 months of practical training. Similar to medical doctors, the students of dentistry have to pass a state exam after completing their residency and to register with the Dental Chamber to obtain a certificate of professional qualification and receive a practicing license.

The duration of pharmacy undergraduate studies is 5 years of integrated undergraduate and master degree with qualification of Master in pharmaceutical studies. Upon completion of one year of practice

on rotation basis in different specialties and in a pharmacy, graduated students have to pass the state exam, and obtain a practicing license issued by the Pharmaceutical Chamber of Macedonia.

5.1.3. Training of nurses and technicians

Nurses, technicians and other auxiliary medical personnel education is available in 10 medical high schools geographically dispersed in larger towns. Upon completion of the 4-years medical high school, nurses, midwives and technicians are required to undertake practical training in order to apply for and pass the state exam. Nurses, technicians and other auxiliary medical personnel who pass the state exam are eligible to apply in any healthcare facility and can obtain on-the-job training for the specific medical field in which they have been employed. Further nursing training to become chief nurse (3-years training) is available in four medical colleges in Skopje, Shtip, Tetovo and Bitola, which are attended after medical high school. Nursing specializations are available in colleges in Shtip and Bitola, but are attended out of personal interest for professional advancement. Despite the long training and wide institutional network of nurses, there is still no system of accreditation, continues education, licensing or re-licensing of nurses and technicians. Hence completed specializations are not rewarded with higher remuneration as the required education for nurses is a medical high school and/or a medical college degree.

5.2. In-service and continuing professional development

5.2.1. Specialist education and scientific advancement

Specialist and sub-specialist education for medical personnel is regulated by an ordinance of the Ministry of Health. Specializations and sub-specializations in most medical and pharmaceutical fields are available at all faculties, and students are enrolled based on predefined quota for each specialty. The faculties are responsible for organizing, registering, conducting and supervising the training of specialties. Practical training takes place at the faculties, accredited health care establishments and other health institutions defined by the ordinance of the Ministry of Health and the faculty. Most specialties take three to four years of training, and require written final specialist thesis and a specialist examination.

Graduates from medical, dental and pharmacy studies can enrol in the post-graduate studies on master or doctor level. After completing the master and doctor level studies, candidates receive a title of master or doctor of science (PhD) in medicine, dentistry or pharmacy.

5.2.2. Training of public health professionals

Education, training, professional development and evaluation of the public health workforce are considered to be crucial for efficiently addressing priority public health problems and adequately evaluating public health activities. There is a need to improve the capacity for public health education,

which, in accordance with the Bologna process, includes qualifications at bachelor, master and doctorate levels, as well as including the public health components in the educational curricula of health professionals.[35]

In order to improve the quality of human resources in the public domain the Ministry of Health initiated various forms of professional upgrade, embedding them as well into the Law on Health Care with the amendments in 2014. These include augmenting in-service medical education with foreign trainers, improving quality of theoretical knowledge and practical skills in pre-service medical education and providing scholarships for medical specializations abroad.

For the 10-year period, the public health programs on master and doctoral level at the Centre for Public Health under the Medical Faculty in Skopje were attended by over 280 students, out of which by the end of 2014, only 65 obtained Master Degree. One of the main reasons for the low graduation rate is the lack of career opportunities, or inadequate recognition and validation of this qualification in the National Classification of Activities and in the organizational structure in the health and non-health institutions.

5.2.3. Continuing medical education

Continuing medical education (CME), previously the responsibility of the Ministry of Health, has been delegated to the professional chambers (medical, dental and pharmaceutical), which are also responsible for licensing and re-licensing of professionals. CME is mandatory and tied to a credit-system. The credit system is used to assess the advancement of knowledge and experience of health professionals, which is a condition for renewal of the practicing license.

CME is included in the contracts between the HIF and the primary care, as a variable part of the capitation (2%) and is evaluated by attendance to workshops for specific CME. For 2017 the scheduled workshops are: prevention and early detection and treatment of children anaemia, diabetic retinopathy, lung cancer and diabetic nephropathy.

5.3. Health workforce education planning

5.3.1. Education policy and accreditation of education institutions

The education and science policies are in authority of the Ministry of Education and Science (MoES). The law on higher education is prepared by MoES and enacted by the Parliament. Under the law, every faculty is responsible to prepare and submit to the MoES the curricula with study plan and objectives, duration, types of examinations and degree to be awarded. Since 2009, the European credit-transfer system was introduced (ECTS) in all higher education institutions, with intention to establish standardization in higher education.

[35] WHO EURO (2012). European Action Plan for Strengthening Public Health Capacities and Services, available at: http://www.euro.who.int/__data/assets/pdf_file/0005/171770/RC62wd12rev1-Eng.pdf

Once adopted by the MoES, the curricula becomes integral part of the faculty's documentation and with fulfilment of other criteria, such as number of staff, teaching competences and scientific attainment, the institution receives accreditation to educate students in health-related sciences. The accredited institutions are regularly monitored by MoES and Inspectorate for Education; accreditation can be revoked in case the conditions (e.g. number of staff) are no longer fulfilled.

5.3.2. Admission policy and attractiveness of profession

In recent years, the official admission policy of the university faculties has become more restrictive in order to achieve a better balance between demand for and supply of human resources for health, and since 1998 admission quota have been reduced accordingly. However, it is the faculties that decide on the admission of self-financing students, and as the decision so far has not been based on any rigid needs assessment, the number of enrolled students is quite high. Moreover, owing to the faculties' restrictions on intake, many young people decide to study abroad.

Table 10. Students enrolled in undergraduate studies in academic year 2015/2016, all institutions

	Total		% Female
	Total	Female	
TOTAL (all institutions, all years)	59,865	32,837	54.9
Higher vocational schools - public	694	529	76.2
Medical sciences - public	7,491	5,309	70.9
Medical sciences - private	258	84	32.6

(Source: State Statistical Office, 2016)

Graduates in medical sciences from all institutions in 2014 and 2015 were 971 and 981 respectively; in 2015, the percentage of female graduates was 57.4%.[36]

5.3.3. Teaching resources and infrastructure

The governing documents of the universities and faculties, i.e. statutes and rule books, regulate the necessary professional upgrade in the field of expertise for all teaching staff, including assistants, associate professors and full tenure professors. However, the criteria for upgrade of teaching skills or introduction of new teaching methods and techniques is not regulated and thus remains within the domain of the personal motivation and interest of the teaching staff.

In the light of the fast development of internet and communication technologies and their application in the health-related and medical sciences, faculties and colleges are attempting to keep up with the infrastructure so to provide access to computers and internet for every student. While this is not possible for the whole education process, some of the subjects, i.e. informatics, epidemiology, medical statistics enable use of computers for students. However, this is an area of interest, which needs further

[36] State Statistical Office (2016). MakStat Izbor, 2015.

assessment of needed investment in modern teaching and scientific aids to make the health-related education in to country in line with the global information expansion.

With the expansion of the number of health education facilities, the competition among them for attracting students with better studying and training conditions has increased. Thus, every faculty performs regular student satisfaction surveys, and also has online form for sending claims and ideas for improvement. Whether these surveys are used and how they affect the teaching programme and approaches, is further to be investigated.

6. HRH UTILIZATION

6.1. Recruitment mechanisms

6.1.1. Public sector

The Ministry of health receives information and demand from the health facilities for the needed human resources in particular specialisation or other types of staff, and considers their justification together with the organisational structure of the given institution. The Ministry then decides on whether a new staff is needed, and upon positive decision, submits request to the Ministry of Finance demanding allocation of funds for the salary for the new position. Ministry of Finance also reviews the justification and decided accordingly. Once approved, the Ministry informs the institution and the job announcement is published.

6.1.2. Private sector

Human resources in the private sector are recruited based on the internal policies of those institutions. The requirements that have to be fulfilled by the staff are same as for the other institutions, i.e. a practicing health professional has to have specific education level, specialisation or subspecialisation and obtained valid licence, which also need to be regularly renewed.

In the private sector, there is no influence from the Ministry of Health or other authority on the appointment of the management staff.

6.2. Deployment and distribution mechanisms

6.2.1. Decentralisation in health care provision

Within the health system decentralization has not taken place, but rather the deconcentration of competences and authority. This means that the responsibilities once under the authority of the Ministry of Health have been delegated to the health Insurance Fund (in 2000) with the introduction of the third-party payer system. In addition, the privatisation of the primary health care enabled the primary care practices to decide themselves on the internal policies for hiring, salary levels etc. Their revenue is mainly generated through capitation payment and through fee-for-service (for dentists), and can be allocated at their discretion for salaries, medical and other equipment and supplies, facility rental and maintenance.

Within other health institutions in the public domain, there is no similar possibility, due to the rights and obligations regulated in the Collective Agreement,[37] which defines the rules of remuneration, bonuses and the minimum salary, and the conditions for higher pay based on education and experience, severity of working conditions, etc.

In the private domain, the rights and obligations of employee and employer should be in line with the labour regulation and defined within the internal policies of the institution.

Table 11. Decentralisation features in health service provision

(narrow, moderate, broad)

Indicator	Value
Choice over salary range (except in primary health care)	No
Ability to hire/fire	Narrow/No
Choice over staff deployment or facility staffing norms	Narrow
Choice over staff transfers	Moderate/Broad
Choice over staff promotion	Moderate

6.3. HRH performance

As defined by the WHO, performance of health workers includes the quality of their work, the technical skills they use, the care they deliver, and the impact of their work on health outcomes.[38]

Improving health workers' performance and productivity is vital to improving health care delivery, the achievement of the Sustainable Development Goals, and commitments, policies, and actions undertaken by countries at national, regional and global levels. However, policy makers and program planers still struggle to determine the correct set of actions to improve worker performance and productivity.[39]

Productivity and quality are elaborated in further details below.

6.3.1. Productivity and efficiency

Productivity is a measure of the output that can be produced given a certain combination of inputs that include both material and human resources. The productivity in health care is one of the most important challenges facing policy makers and healthcare system. Useful measures of health care value must

[37] Collective Agreement for Healthcare in the Republic of Macedonia, Official Gazette of the Republic of Macedonia, no. 60/06, 85/09, 60/10

[38] WHO (2012). The Labour Market for Human Resources for Health in Low- and Middle-Income Countries. 2012. Available at http://www.who.int/hrh/resources/Observer11_WEB.pdf

[39] Technical Working Group (Twg) #7 (2014). Improving health worker productivity and performance in the context of universal health coverage: the roles of standards, quality improvement, and regulation; background paper to the report on Global Health Workforce Strategy

therefore account for the effectiveness, quality, and match of the treatments provided to patients. For example, a metric that only captures the number of patients seen per day could easily portray a physician who does shoddy work quickly as being very productive (even if another physician has to go back and repair the damage later), while a slower but safer and more effective physician would appear relatively unproductive.

One of the measures of productivity is the bed occupancy rate and average length of stay. Since there is no specific metric system introduced at national level for measuring health workforce productivity, the average length of stay for a certain clinical condition as well as the cost of the service serve as a measure of productivity in health care. The figures for bed occupancy rate and average length of stay for 2011 and 2014 are given in the table below.

Table 12. Performance of HRH: Bed occupancy rate and average length of stay by hospital type, and discharge type, 2011/2014

	Number of beds/cases	Bed occupancy rate (%)	ALOS in days
By hospital type (2011)			
General Hospitals	2,537	43.3	5.4
Clinical Hospitals (Bitola, Tetovo, Shtip)	1,482	39.5	5.4
Specialized hospitals*	986	29.5	n/a
University clinics (tertiary level)	2,344	53.9	n/a
By discharge type (2014)			
Discharge upon completed treatment	222,610		5.6
Discharge with transfer to other hospital	4,462		3.0
Discharge to treatment in home-care facility	51		13.2
Discharge with transfer to psychiatric hospital	74		4.6
Discharge with transfer to other type of healthcare facility	241		5.9
Voluntary terminated treatment	3,634		3.6
Death	3,560		6.9
TOTAL	234,642		5.5

Source: HIF, 2012b; Health Insurance Fund: DRG Annual Report 2014
Notes: n/a: not available; * Psychiatric hospitals are not included.
(adapted from: Milevska et al 2017)

The number of hospital beds/1000 population in 2014 is 4.4 and there is a slight decrease compared to 2007 (4.6/1000). It could be considered as a trend towards shortening of the length of hospital stay and ambulatory surgical interventions, promotion of one day surgery and increase in ambulatory care.

The productivity of human resources in outpatient care is measured through the electronic appointment system “My appointment” introduced in 2014. This system is one form of measuring the productivity of the doctors in out-patient care; it allows for counting the number of patient visits, time spent in consultation and time spent in administrative works, and comparing these values to calculate the time efficacy of the outpatient care within the health care system.

Another metrics for the productivity and efficiency in inpatient health care is the Diagnosis Related Groups (DRG) system, introduced in 2009, which measures the efficiency of healthcare at facility level.

The HIF publishes an annual report of the performance of the health institutions that provide in patient care that is covered by the mandatory health insurance.

Improving the productivity of the health care system will require the primary focus to be determination of services that improve the health status and also eliminate the services that are inefficient, have low quality and inadequate to the patient's needs, and after that finding a way to improve the efficiency of the selected services and their delivery using as few resources as possible.

6.3.2. Quality

Quality is an area where no single metric can measure success. Organizations can look at mortality rate, infections, or patient safety, and each area will have different metrics. Health institution's managers must consider all relevant factors, such as the staffing levels required to deliver optimum care, to make a final determination on how best to deliver superior care. There are two main arguments for promoting a focus on quality in health systems at this time. Even where health systems are well developed and resourced, there is clear evidence that quality remains a serious concern, with expected outcomes not predictably achieved and with wide variations in standards of health-care delivery within and between health-care systems. Where health systems – particularly in developing countries – need to optimize resource use and expand population coverage, the process of improvement and scaling up needs to be based on sound local strategies for quality so that the best possible results are achieved from new investment.[40]

In 2014, an independent Agency for Quality and Accreditation of Healthcare Facilities (Agencija za kvalitet i akreditacija na zdravstveni ustanovi vo Makedonija, AKAZUM) has been established to develop and monitor the implementation of quality of care standards in healthcare facilities in all levels of care. To date, the quality system has compiled all necessary steps and indicators for achieving quality of care:

- The Law for Health Care requires establishment of internal Committees for quality of care and its follow up and improvement;
- Implementation of the standards for accreditation (the process initiated in 2014) is a step forward towards improving the Quality of Care, and the system of internal and external assessment is a kind of evaluating and measuring the quality of care;
- Collecting indicators of Quality of Care.

There are six areas or dimensions of quality, which are named and described below. These dimensions require that health care be:

- Effective, delivering health services that are evidence based and results in improved health outcomes for individuals and communities, based on need;
- Efficient, delivering health services in a manner which maximizes resource use and avoids waste of resources;

[40] Quality of care: a process for making strategic choices in health systems. World Health Organization, 2006

- Accessible, delivering health services that are timely, geographically reasonable, and are appropriate to medical need;
- Acceptable/patient-centred, delivering health services which take into account the preferences and aspirations of individual service users and the cultures of their communities;
- Equitable, delivering health services which does not vary in quality because of personal characteristics such as gender, race, ethnicity, geographical location, or socioeconomic status;
- Safe, delivering health services which minimizes risks and harm to users.

The main Chapters of the developed Standards for hospital level health care (approved by the Government of the Republic of Macedonia in March 2015) for improving the quality of care in health care institutions cover three main areas:

- Standards related to governance and management;
- Standards related to risk management and patient safety;
- Standards related to patient treatment and specific clinical services.

To reach the standards, among other, is required achieving an appropriate ratio staff/patients, which in the moment is still not fully achieved in all regions, specialties and other auxiliary professions.

The system of quality of care is currently being established, and no data is available yet as to whether there are differences in quality of received care.

6.3.3. Improving health workforce performance, productivity and quality

To achieve universal health coverage so that all of the population and all subgroups, have access to quality care involves improving the performance of the health workforce at every system level and society – national, local, on facilities level, and communities. To do so, it is needed to strengthen the capacity of managers, frontline providers and community health workers, to recognize and improve their own performance, identify strategies for improving care, and monitor and evaluate best practices and health outcome results, so that evidence will inform decisions and shape policies. This capacity, developed at all delivery levels, results in strengthened systems and sustained quality of care.[41]

Much of the current focus of quality improvement has been on redesigning care delivery processes to enable providers to follow evidence-based guidelines. These experiences in adapting improvement methods to work across organizations levels are showing promising results.[42] Employee involvement through quality improvement teams has resulted in improved processes of care and patient outcomes. Bringing teams of health workers from across the levels of the health system to work together in improvement teams allows the system to tap into their knowledge of the system's inner workings and develop potential solutions that can work. Engaging health workers in the design, testing and

[41] USAID ASSIST Project. Improving Health Worker Performance. 2014. Bethesda, MD: University Research Co., LLC. Published for the U.S. Agency for International Development (USAID) by the Quality Assurance Project. Available at https://www.usaidassist.org/sites/assist/files/improving_health_worker_performance_feb2014.pdf

[42] Franco, L.M., Marquez, L. Effectiveness of Collaborative Improvement: Evidence From 27 Applications in 12 Less-Developed and Middle-Income Countries. BMJ Qual Saf 2011; 20:658-665.

implementation of changes enables clinical and non-clinical health workers at all levels of the system to innovate and test practical ways that better utilize existing resources to improve health care.[43]

Educating health workers may only further magnify the "know-do" gap if health workers do not see themselves as agents of change and are not empowered to make changes. Increased engagement among nurses, for example, in high income countries has been associated with greater patient satisfaction, nurse retention, and morale; lowered complications; and improved clinical measures such as reduced infections and medication errors.[44] Since most providers who participate in improvement activities carry out this work without compensation, suggests that non-material incentives are also an important factor. Research interest in this area in the last few years is in the rise and should be focused on establishing motivational factors and finding ways to implement them in the everyday work of the health care.[45]

Since 2007, in order to improve the economic and financial performance of the public health institutions, a so-called 'four-eye' principal was implemented at hospital level with two managers (medical and financial), and a requirement for joint signature of documents concerning economic and financial matters. Initially applicable to all hospitals, it was later revised to apply only for institutions with over 1000 employees, university clinics, clinical hospitals and institutes. Managers are appointed by the Minister of Health, and have the obligation to undergo and pass training for managers in health sector.

After the introduction of the system for pay for performance for the specialists in the public health institutions, the Ministry of health started a project for introduction a Balanced Scorecard. This system links the managers' salaries with criteria and indicators to increase the responsibility in their performance and improve the financial operations in the institutions.

The performance of the institutions and the managers is measured in these areas:

- Finance – compliance with the planed revenues and expenditures, controlling the level of arrears, new sources of revenues, compliance with the plans for drugs and other medical expenditures, follow the financial regulation;
- Patients – hygiene, patient satisfaction, food, waiting times, response to complaints
- Development/training – new interventions and skills, scientific work, retention of talented employees, maintenance of quality assurance system;
- Clinical focus – compliance of protocols, decrease of mortality, use of "My Appointment", achievements in pay for performance system.

The system evaluates the institutions on quarterly basis and managers are subject to merit system of reward/fine on their own salary depending on the performance of the institution. Based on these criteria the Ministry has started health institution ranking, and announced new indicators, such as: Caesarean sections rate, waiting times, surgery theatre utilization rate, length of stay, unjustified referrals to other

[43] Schmidt FL, Hayes TL. Business-unit-level Relationship between Employee Satisfaction, Employee Engagement, and Business Outcomes: A Meta-analysis. Journal of Applied Psychology. 2002. 87(2):268- 79.
[44] Schmidt FL, Hayes TL. Business-unit-level Relationship between Employee Satisfaction, Employee Engagement, and Business Outcomes: A Meta-analysis. Journal of Applied Psychology. 2002. 87(2):268- 79.
[45] Technical Working Group (Twg) #7 (2014). Improving health worker productivity and performance in the context of universal health coverage: the roles of standards, quality improvement, and regulation; background paper to the report on Global Health Workforce Strategy

hospitals. Although the Ministry monitors the data and indicators, there are no publicly available data on the practical implementation and effect of the project to the improvement of the financial efficiency of the health system.

6.4. HRH mobility and retention

Despite the increasing numbers of doctors, dentists and nurses, there is anecdotal evidence suggesting that the sustainability of the health workforce is threatened by increased professional migration to other countries. There is no data available on numbers, qualification, age, professional distribution or duration of health professionals working abroad (Lazarevik et al., 2015). However, it is estimated that more physicians than other professionals apply for certification to work abroad.

There is scarce available research data on the magnitude of health workforce migration in Macedonia and its' consequences. A survey on migration of health workforce was conducted in the period December 2014 – March 2015,[46] targeting both doctors that have already migrated, as well as those who remained in the country. Additionally, focus group interviews have been conducted with junior and more experienced doctors working in the country, as well as interviews with relevant policy makers and stakeholders. The findings have shown that around 70% of the total responders of the survey have answered that they have considered migration to some of the EU countries; of these male doctors were more likely than female doctors to consider migration (OR=4.675; CI=2.04- 10.69), more senior doctors (over 55 years of age) were less likely to consider migration, while there was no difference about considering migration in doctors with and without children.

The main reasons for migration were remuneration, working and living conditions as well as dissatisfaction with status and career opportunities for medical doctors. These factors are important to all doctors irrespective of their age, gender and marital status.

Political factors, presented through pressure for getting an employment or for career advancement can also be very strong factors for migration. Over 70% of migrated doctors and doctors who are currently unemployed have stated that they have experienced political pressure in order to get employment.

Personal and social reasons are also strong factors that can determine one's consideration to migrate. Doctors feel that their status in the society has been deteriorated and do not feel safe in their working environment.

Overall, around 40% of doctors feel satisfied with their work as a physician; yet, this percentage is even higher for doctors who have migrated. Similarly, doctors who have already migrated are significantly more likely to recommend their profession to younger generations.

The survey concludes that the migration of health workers in the country is becoming a trend that can seriously affect the stability of the health system in the near future, calling for change in the policy making.

[46] Healthgrouper (2015). Policy brief Macedonia – Health workforce migration, http://healthgrouper.com/documents/4417/POLICYBRIEF-MKD_09%2009%202015.pdf

The Ministry of Health starting from 2012 has taken the initiative to improve qualifications of health personnel and implement new procedures in the country, by educational study visits to internationally renowned medical universities, teaching centres and hospitals, while at the same time bringing colleagues from abroad for exchange of experience and practice. Since 2012, over 2.200 doctors have visited renowned medical centres in Europe, USA and Australia, and according to Ministry's analyses, around 70% of them have implemented new procedures in their hospitals.[47] In addition, the Ministry of Health made efforts to improve working conditions and to offer continuing professional development for doctors in primary health care as well as the introduction of a pay-for-performance (P4P) scheme, as measures to contribute to reversing the migration trend.

Table 13. Migration of health workforce, 2015

Indicator	% of emigrants by occupation of the total number of emigrants
External migration of citizens	
General practitioners	0.65
Dentists	0.13
Physiotherapists	0.26
Pharmacy technicians	0.52
Nurses	1.04
Dental technicians	0.26
Total	**2.87**
Internal migration of citizens	
General practitioners	0.77
Community workers	0.39
Total	**1.16**

(Source: State Statistical Office 2016)

Recognizing that migration from public to private sector is draining the capacities and quality of care in the public domain, the new Law on Health Care (2013) also regulates the possibility for carrying over contracts of specialist from the private to the public sector. Since the introduction of this option, through bypassing the employment procedure, around 200 specialists were transferred by agreement from private to public healthcare facilities.[48]

As the table shows, the percentage of health workforce that has emigrated from the country is more than double the percentage of migrated within the country, as a share of the total number of migration in and out of the country. The relatively large difference in migration data from official statistics and conducted studies calls for additional research on this issue.

[47] MoH (2016) Official website www.zdravstvo.gov.mk
[48] MoH (2016). Official website: www.zdravstvo.gov.mk

6.5. Cross-cutting issues

6.5.1. Absenteeism and presenteeism

Absenteeism is an employee's intentional or habitual absence from work, while presentism is defined as attendance at work of employees who doe to sickness or other circumstances are not in position to perform their work duties. While employers expect workers to miss a certain number of workdays each year, excessive absences can equate to decreased productivity and can have a major effect on company finances, morale and other factors. The health system should look at the causes of absenteeism, the costs of the decreased productivity and what employers can do to reduce absenteeism rates in the workplace.[49]

Absenteeism can be due to a number of reasons, many of which are legitimate and other less so; the most commonly looked at are: burnout, harassment, childcare or eldercare, depression, disengagement, demotivation, illness, or stress. Workplace stressors affect the productivity, human relationships and the work organization by increasing absenteeism, decreasing job commitment, increasing staff turnover, impairing performance, and productivity, increasing unsafe working practices, accident rates, complaints from clients, and customers including patients.[50] No specific studies have been conducted in relation to absenteeism, although some studies exist of considering this phenomenon as an indicator of job satisfaction, which is reviewed elsewhere in this profile.[51]

On the other hand, there are increasing number of studies and evidence that health workforce is more prone to going to work even when sick. This phenomenon called presenteeism, is increasingly present among medical professionals worldwide, and needs further research attention, especially given the policy changes that affected primary level of care.

6.5.2. Multiple job holding

Before the amendment of the Law on health care in 2012, the doctors in public health institutions weren't limited to practice health care in other, mainly private health institutions in the country. With the amendment, this option was abolished, or supplementary activity was introduced as a option how under defined conditions (performance in regular working hours, services not covered by HIF, under previously defined prices) specialists from public health institutions can work extra hours in their or other public or private institution. A requirement for supplementary activity is a signed contract between

[49] The causes and costs of absenteeism. http://www.investopedia.com/articles/personal-finance/070513/causes-and-costs-absenteeism.asp#ixzz4QfcFDaaL

[50] Leiter, M. P., & Maslach, C. (2000). Burnout and health.In A. Baum, T. Revenson & J. Singer (Eds.), Handbook of health psychology (pp. 415–426). Hillsdale, NJ: Lawrence Earlbaum. Retrieved from http://cord.acadiau.ca/publications.html;
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Lemkau, J., Rafferty, J., & Gordon, R., Jr (1994). Burnout and career-choice regret among family practice physicians in early practice. Family Practice Research Journal, 14, 213–222.

[51] Zeqiri I Aziri B (2010). Job satisfaction in the Republic of Macedonia: The role of gender and education, MPRA Paper No. 22209, posted 21. April 2010 00:38 UTC

the public and the private institutions for services with defined prices that the private will compensate to the public institution. Therefore, a specialist to have multiple job holdings is regulated with contract for providing services by the public to the private health institution.

Beside the supplementary activity, doctors from one public can perform health services in other public health institution, with signed contract between the two public institutions. Starting in 2013, in order to improve capacities and implement new procedures in the public health institutions across the country, the Ministry started the project named "dispersed clinic". Specialists and subspecialists form higher level of health care institutions (clinics, institutes, special hospitals) in scheduled visits started to provide services in hospitals and health homes across the country.

6.5.3. Job satisfaction and motivation

At present, there are no publicly available data or published studies on the job satisfaction of health workforce.

Since 2015, obligatory annual survey for medical and non-medical staff in hospitals throughout the country is required within the Standards for Quality and Accreditation of Health Care Institutions established by the Agency for quality and accreditation of healthcare institutions in Macedonia (AKAZUM). The summary of the analysis is a basis for development of plan for improvement of employees' satisfaction, which is mandatory by accreditation standards and assessed by AKAZUM. This activity is still in initial stages of development; once the practice fully established, AKAZUM is expected to regularly publish the results.

6.5.4. Stress and burnout

Among numerous hazards at the workplace, human resources for health are exposed to psychosocial hazards, which stem from the workplace conditions and workplace demands. These factors include different aspects of work and work environment, such as organizational climate or culture, interpersonal relationships, design, and content of workplace activities.[52]

Work-related stress can be defined as harmful physical and emotional response that occurs when requirements of the work do not match the capabilities, resources or needs of the worker. Work-related stress can lead to poor health and even injury (National Institute for Occupational Safety and Health [NIOSH], 1999). It can also lead to burnout syndrome, which is often identified among human resources for health.[53]

Workplace stress affects productivity, interpersonal relationships and work organizations, by increasing absenteeism, decreasing job commitment, increasing staff turnover, impairing performance, and productivity, increasing unsafe working practices, accident rates, complaints from clients, and customers Moreover, stress can have many well-known and detrimental effects on quality of life and

[52] Inter-national Labour Organization [ILO] & International Occupational Safety and Health Information Centre [CIS], 2000.
[53] Leiter & Maslach, 2000; Maslach & Leiter, 1997; National Institute for Occupational Safety and Health [NIOSH], 1988.

work: it might influence overall well-being, social relations, and family life or cause absence from work, early retirement, lower productivity, and lower quality of service or products.

While some studies have analysed associations between burnout and quality of care in hospitals,[54] relations between job stress and quality of care were rarely examined.[55] In Macedonia there are no detailed studies on work-related stress and burnout syndrome among health workforce during the last two decades that suggests the need for further research on the stressors influence on quality of care in such socio-economic circumstances.

The Institute for Occupational Health of the Republic of Macedonia - Skopje, WHO Collaborating Centre, implements a FP7 Project, financed by the European Commission, on 'Improving quality and safety in the hospital: The link between organizational culture, burnout, and quality of care (ORCAB)', aimed at determining the organizational and individual factors that influence quality of care and patients' safety and to design interventions that both increase quality of care and at the same time contribute to health professionals' wellbeing.

[54] Bakker, Schaufeli, Sixma, Bosveld, & Dierendonck, 2000; Firth- Cozens & Greenhalgh, 1997; Linn et al., 1986; Montgomery, Panagopoulou, Kehoe, & Valkanos, 2011; Tait, Shanafelt, Bradley, & Back, 2002
[55] Klein, Grosse Frie, Blum, & von dem Knesebeck, 2011

7. GOVERNANCE FOR HRH

7.1. HRH policies

As already explained earlier, there is no single policy addressing the human resources for health in or outside of health sector.

While there is no specific HRH department/unit in the Ministry of Health, the analysing and planning process of the health workforce is done throughout the different departments coordinated by the cabinet of the Minister of Health. The Ministry of Health receives information and demand from the health facilities for the needed human resources in particular specialisation or other types of staff, and considers their justification together with the organisational structure of the given institution. The Ministry then decides on whether a new staff is needed, and upon positive decision, submits request to the Ministry of Finance demanding allocation of funds for the salary for the new position. Ministry of Finance also reviews the justification and decided accordingly. Once approved, the Ministry informs the institution and the job announcement is published.

7.2. Stakeholders in HRH

As every sound policy, the policy for human resources for health should be constituted in an inclusive consulting process that includes all stakeholders who will ensure commitment and engagement for its implementation. It is therefore, essential to understand the stakeholders' landscape, not just from the health sector, but from the whole of government and whole of society perspective, mainly form the health sector but as well other sectors, such as education and vocational training, finance, public service; professional bodies, such as associations and licensing chambers, surveillance bodies, education and training institutions, universities, practitioners, civil society organisations working in and for health, as well as the end users.

The Table 26 in Annexes section provides an overview of the major stakeholders concerned with the human resources for health. However, the sections below depict only the ones considered most important, beyond the authorities and competences of the key institutions at central level, including Ministry of Health, Ministry of Education ad Science and Health Insurance Fund.

7.2.1. Professional chambers and associations

The medical personnel are organized in chambers, established under the Law on Health Care, whose main goal is advocating and protecting the common professional interests and rights. There are three chambers: the Doctors' Chamber of Macedonia (*Lekarska komora na Makedonija*, LKM), the Dental Chamber of Macedonia (*Stomatoloska komora na Makedonija*, SKM) and the Pharmaceutical Chamber of Macedonia (*Farmacevtska komora na Makedonija*, FKM). The chambers are responsible for licensing and re-licencing of professionals. After 2012, the chambers have by law also assumed the role of professional audit of the healthcare professionals. Further, every year they negotiate with the HIF on the contract details both in legal and financial terms, including obligations and rights of the HIF and providers, scope and volume of services as per adopted clinical guidelines, payment levels and methods, and penalties.

In this context there are still no chambers for public health professionals or nurses.

Professional scientific societies are established under the Law on Associations and Foundations, which has a broader definition of an association (Official Gazette of RM, no. 52/10). The Macedonian Medical Association (*Makedonsko lekarsko drustvo*, MLD), the Dental Association and the Pharmaceutical Association are established under this law, with the main aim to advance the scientific research, the profession and the professional standards. MLD is an umbrella organization of 70 specialist societies. It is responsible for providing continuing medical education through their member associations which it performs in coordinated fashion with LKM. In the same manner, continuing pharmaceutical and dental education are provided through the respective professional societies in collaboration with respective chambers. Both the chambers and the professional societies are consulted by the Ministry of Health and the HIF in the reforming and policy making processes, but their influence is rather limited.

7.2.2. Local self-government

The Law on Local-Self Government provides legal grounds for involvement of local governments in health care through public-health activities. While the decentralisation in the health sector has not been initiated yet, the function that is being performed by the municipalities is the support of public health issues through the Public Health Councils, regulated as possibility within the Law on Public Health. Public Health Councils at the local level have the mandate to address issues of public health importance for the local communities; they can be established by one or several municipalities.

7.2.3. Civil society organizations

According to the Law on Health Care, provision of health services is exclusively in the domain of health providers; however, other legislation, such as Law on Public Health and Law on Local-self government enables civil society organisations to take part in health promotion and prevention activities. Most prominent to date is the example of involvement of civil society organisations through the Global Fund for AIDS, Tuberculosis and Malaria (GFATM) grants for HIV/AIDS and tuberculosis; through these grants over a period of one decade, the civil society organisations have played role in health education and prevention, though numerous activities, as the program for needle exchange, awareness raising campaigns, preventive testing, young people counselling points, informative material development and distribution and so forth. Another exemplary collaboration with civil society is Red Cross involvement with preventive services and campaigns for healthy lifestyles and healthy choices across the country. In addition to this, civil society organisations are also involved in humanitarian activities – most recently with the migrant crisis, in which wider number of civil society organisations have taken part in the coordinated health response to specific target groups, such as chronic patients, children, women and so forth. Civil society organisations also play part in the policy formulation and monitoring of its implementation.

7.2.4. International agencies/organizations

Most important form of involvement of international agencies for health is through extending technical advice in situation analysis, policy development, formulation, monitoring and evaluation of attainment of set goals. In this process, key role is played by World Health Organisation (WHO), which provides technical support and advice based on the demand and in collaboration with the Ministry of Health. In addition, other UN agencies also play part through direct (UNICEF, UNFPA) or indirect (UNDP, UNHCR) involvement and technical assistance provided to issues that have influence on health and wellbeing.

7.3. Professional regulation

7.3.1. Licensing and re-licensing

Upon graduation, and passing the state exam, graduates acquire the right to practicing license, with or without further specialization. Hospital managers have the possibility to decide which interns to train further in specializations as well as how many interns to employ. Waiting times for an intern position can vary greatly between different specialist fields. Since 2010, completing a specialty requires a minimum number of performed interventions in the respective field. Most specialties take three to four years of training and require a written final specialist thesis and a specialist examination. There is a two stage licensing of health personnel:

- Basic Licence - completion of 6 or 12 month practical training and passing of state exam.
- Specialisation Licence - upon completion of the specialisation programme, providing a licence to practise in the field of specialisation.

Every licensed health professional has to undergo relicensing every 7 years, by fulfilling predefined criteria. The professional chambers are responsible for licensing and supervising the professional conduct of their members. In order to improve the performance of health care personnel and thereby to enhance the quality of health services the chambers have been granted the authority to extend, renew and deprive individuals of working licences.

8. THE WAY FORWARD

8.1. Conclusions

To accelerate the progress towards achievement the objectives of the national development agenda and the attainment of the Sustainable Development Goals, it is essential to consider effective and efficient measures to improvement of health, health promotion and disease prevention. In this process, ensuring equitable access to health care provided by skilled and motivated health workforce within a performing health system, as well as upstream within other sectors influencing health and wellbeing is essential.

The National Health Strategy 2020 acknowledges the importance of the human resources in the process on delivery of health targets, not only in the health sector, but in other sectors as well. The Strategy provides distinct pillar within its structure – dedicated to health system and resources, both human and infrastructure. As part of this pillar, the Strategy is envisaging development and implementation of Action Plan for Human Resources for Health until 2020, with main goal to contribute to the achievement of the vision and strategic goals set in the National Health Strategy 2020 and in the national development agenda.

From the above profile, the following conclusions can be drawn:

- There is no comprehensive policy on production, management and maintenance of human resources in the health sector. Such document would provide for more coherent approach to addressing the issues identified through this profile and thorough other policy documents;
- There are discrepancies in the data obtained from the national sources regarding human resources working in the health sector. The obligation of private providers to report their human resources status to the national institutions is not always respected, and therefore, data from different sources is not always coherent, and often not clear whether it includes both public and private or just public and partial data from private providers;
- There is lack of specific specialties across the system, including general practitioners and gynaecologists at primary level of care. There is also lack of auxiliary staff in particular health institutions in the public domain;
- The ageing of medical profession is of concern across all specialties and levels of care;
- Remuneration levels and incentive mechanisms are aimed at measuring input rather than output parameters. This affects the quality and cost-effectiveness of care;
- Real-time monitoring system of HRH is needed, on order to have day-to-day overview of the human resources utilisation, management and maintenance, as input information for proper planning of health workforce. This is possible to be implemented as part of the Directorate of E-health competences and authority.

8.2. Policy recommendations

In line with the situation analysis, challenges and the possibilities mentioned above, the following recommendations have arisen:

The planning of health workforce and human resources for health in general, should be based on continuous assessments of the current situation and the identified needs for personnel production and recruitment, considering the different internal and external factors such as retirement, internal and external migrations and so forth. For this purpose, it is necessary to build a dynamic system for human resources for health that monitors the situation in real time; this system is a under the Directorate for e-health responsibility and once established, the gathered data could be a sound foundation for preparation of an Action plan for human resources for health 2020.

Planning of human resources for health should incorporate and envision internal and external factors that influence the health and health system dynamics; health services demand, personnel and technology, demographic changes, population migration, age, sex, culture and tradition etc. Beyond health services, planning of human resources for health should also incorporate workforce working on preventive activities within and outside of the health system, such as improvement of health literacy, patients' awareness and empowerment, and so forth.

Monitoring of performance of the health workforce provides information on the strength and integrity of the health system; however monitoring through input parameters (number or examinations etc.) instead of outputs (readmissions, number of visits to reaching correct diagnosis or adequate therapy, medical errors and near-miss situations, etc.), affects both quality and cost-effectiveness of care, and at the same time is not a warranty of improvement of the health status of individuals and entire population.

Professionalism and engagement of personnel is directly linked to motivation and incentives; the system of licensing is a model of motivation for professional development through conditional relicensing for medical doctors, dentists and pharmacists. Such system of accreditation, licensing and relicensing has not yet been considered or introduced for public health specialists and nurses, but its design and introduction is recommended even more with the legal basis and opportunity provided by the Law on Health Care and Law on Public Health.

Stimulation measures to reward for fulfilment of preventive health goals or delivery on specific number of interventions have also been introduced in primary and secondary care respectively. The effects of these measures needs to be assessed, and if necessary to be adjusted to the output rather than input performance measurements.

To improve the social coherence and ultimately health status of the population, while retaining cost-effectiveness of the system, there is a need for more upstream programmatic approach to health, which should involve other sectors and their workforce that contribute to healthy lifestyles and prevention of diseases. In such way, health would reach its full potential in contributing to economic growth and development.

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10. ANNEXES

Annex 1. Healthcare resources in the country

Table 14. Number of doctors all levels by health regions, 2015

Health region	*Number of doctors*	*Population per doctor*
TOTAL	**5975**	**346.5**
Berovo	39	459.7
Bitola	381	267.1
Makedonski Brod	13	860.3
Valandovo	18	656.1
Veles	167	396.4
Vinica	33	588.8
Gevgvelija	85	404.0
Gostivar	215	557.7
Debar	43	646.8
Delchevo	46	520.9
Demir Hisar	33	252.4
Kavadarci	121	355.5
Kichevo	90	634.5
Kochani	94	509.6
Kratovo	21	454.1
Kriva Palanka	43	554.7
Krushevo	12	791.8
Kumanovo	299	477.7
Negotino	46	509.6
Ohrid	244	228.9
Prilep	228	417.6
Probishtip	30	508.6
Radovish	47	694.3
Resen	44	371.6
Sveti Nikole	31	659.5
Skopje	2589	239.2
Struga	168	404.4
Strumica	211	449.2
Tetovo	383	522.2
Shtip	201	262.0

(Source: Institute of Public Health, 2016)

Table 15. Number of specialists by health regions, 2015

Health region	*Total*	*General medicine*		*Ongoing specialisation*		*Specialists*	
		No.	*%*	*No.*	*%*	*No.*	*%*
TOTAL	**5975**	**1706**	**28.6**	**565**	**9.5**	**3704**	**62.0**
Berovo	39	22	56.4	2	5.1	15	38.5
Bitola	381	96	25.2	24	6.3	261	68.5
Makedonski Brod	13	8	61.5	0	0.0	5	38.5
Valandovo	18	10	55.6	1	5.6	7	38.9
Veles	167	52	31.1	18	10.8	97	58.1
Vinica	33	15	45.5	2	6.1	16	48.5
Gevgvelija	85	19	22.4	17	20.0	49	57.6
Gostivar	215	99	46.0	16	7.4	100	46.5
Debar	43	9	20.9	4	9.3	30	69.8
Delchevo	46	25	54.3	1	2.2	20	43.5
Demir Hisar	33	14	42.4	4	12.1	15	45.5
Kavadarci	121	47	38.8	5	4.1	69	57.0
Kichevo	90	38	42.2	16	17.8	36	40.0
Kochani	94	25	26.6	5	5.3	64	68.1
Kratovo	21	10	47.6	1	4.8	10	47.6
Kriva Palanka	43	20	46.5	6	14.0	17	39.5
Krushevo	12	9	75.0	0	0.0	3	25.0
Kumanovo	299	114	38.1	34	11.4	151	50.5
Negotino	46	22	47.8	3	6.5	21	45.7
Ohrid	244	56	23.0	33	13.5	155	63.5
Prilep	228	79	34.6	23	10.1	126	55.3
Probishtip	30	14	46.7	1	3.3	15	50.0
Radovish	47	28	59.6	0	0.0	19	40.4
Resen	44	17	38.6	3	6.8	24	54.5
Sveti Nikole	31	18	58.1	0	0.0	13	41.9
Skopje	2589	520	20.1	211	8.1	1858	71.8
Struga	168	45	26.8	24	14.3	99	58.9
Strumica	211	79	37.4	23	10.9	109	51.7
Tetovo	383	146	38.1	52	13.6	185	48.3
Shtip	201	50	24.9	36	17.9	115	57.2

(Source: Institute of Public Health, 2016)

Table 16. Number of dentists by health regions, 2015

Health region	*Number of dentists*	*Population per dentist*
TOTAL	1824	1135.0
Berovo	13	1379.0
Bitola	163	624.2
Makedonski Brod	3	3728.0
Valandovo	9	1312.2
Veles	47	1408.4
Vinica	17	1143.0
Gevgvelija	30	1144.6
Gostivar	79	1517.7
Debar	5	5562.8
Delchevo	15	1597.3
Demir Hisar	5	1666.0
Kavadarci	46	935.1
Kichevo	22	2595.8
Kochani	38	1260.6
Kratovo	4	2384.0
Kriva Palanka	12	1987.5
Krushevo	6	1583.5
Kumanovo	101	1414.0
Negotino	17	1379.0
Ohrid	62	900.8
Prilep	127	749.6
Probishtip	10	1525.7
Radovish	19	1717.4
Resen	10	1635.2
Sveti Nikole	10	2044.3
Skopje	661	936.9
Struga	40	1698.4
Strumica	80	1184.8
Tetovo	127	1575.0
Shtip	46	1144.9

(Source: Institute of Public Health, 2016)

Table 17. Number of pharmacists by health regions, 2015

Health region	*Number of pharmacists*	*Population per pharmacist*
TOTAL	**1029**	**2011.9**
Berovo	8	2240.9
Bitola	107	950.9
Makedonski Brod	3	3728.0
Valandovo	8	1476.3
Veles	41	1614.5
Vinica	7	2775.9
Gevgvelija	8	4292.3
Gostivar	28	4282.0
Debar	7	3973.4
Delchevo	9	2662.2
Demir Hisar	5	1666.0
Kavadarci	29	1483.3
Kichevo	14	4079.1
Kochani	30	1596.8
Kratovo	3	3178.7
Kriva Palanka	5	4770.0
Krushevo	4	2375.3
Kumanovo	78	1831.0
Negotino	9	2604.8
Ohrid	28	1994.6
Prilep	60	1586.7
Probishtip	5	3051.4
Radovish	7	4661.6
Resen	15	1090.1
Sveti Nikole	4	5110.8
Skopje	315	1966.0
Struga	27	2516.2
Strumica	41	2311.7
Tetovo	98	2041.0
Shtip	26	2025.7

(Source: Institute of Public Health, 2016)

Table 18. Number and coverage of general practitioners (GPs) by statistical regions, 2015

Regions	*Number of GPs*	*GPs per 1000 insured persons*
Vardar	123	0.89
Eastern	119	0.75
Southwestern	141	0.80
Southeastern	129	0.84
Pelagonija	182	0.85
Polog	219	0.89
Northeastern	143	0.99
Skopje	487	0.78
TOTAL	**1543**	**0.85**

(Source: 2015 HIF Annual Report, 2016)

Table 19. No and coverage of gynaecologists at primary level by statistical regions, 2015

Regions	Total no. of gynaecologists	Gynaecologists per 1000 insured women
Vardar	11	0.16
Eastern	14	0.17
Southwestern	17	0.19
Southeastern	11	0.14
Pelagonija	14	0.13
Polog	11	0.09
Northeastern	12	0.16
Skopje	47	0.15
TOTAL	**137**	**0.15**

(Source: HIF Annual Report 2015)

Table 20. Number and coverage of dentists at primary level by statistical regions, 2015

Regions	*Total no. of dentists*	*No. of dentists per 1000 insured persons*
Vardar	96	0.70
Eastern	93	0.58
Southwestern	139	0.79
Southeastern	113	0.74
Pelagonija	182	0.85
Polog	145	0.59
Northeastern	87	0.60
Skopje	333	0.53
TOTAL	1188	0.67

(Source: 2015 HIF Annual Report, 2016)

Table 21. Distribution of health workforce with higher, mid-level or lower qualifications across levels of care, 2009-2013

	2009	2010	2011	2012	2013
HW WITH HIGHER OR MID-LEVEL QUALIFICATIONS					
Total	4 104	4 256	4 316	4 327	4 442
General hospitals	1 866	2 107	2 217	2 198	2 290
Clinics and institutes	1 178	1 118	1 091	1 079	1 131
Specialized hospitals and rehabilitation centres	1 004	981	960	1 003	975
Hospitals for pulmonary TB	47	43	40	40	43
Institutes for pulmonary diseases and TB for children	62	57	62	62	60
Institutes for orthopaedics and traumatology	129	129	116	126	128
Mental hospitals	311	331	324	343	317
Rehabilitation centres	173	169	166	165	170
Other specialized hospitals	282	252	252	267	257
Non-hospital dispensaries	56	50	48	47	46
HW WITH LOWER-LEVEL QUALIFICATIONS					
Total	514	484	291	393	294
General hospitals	336	274	218	291	221
Clinics and institutes	112	100	31	56	30
Specialized hospitals and rehabilitation centres	61	105	38	42	39
Hospitals for pulmonary TB	6	6	6	12	6
Institutes for pulmonary diseases and TB for children	-	-	-	-	-
Institutes for orthopaedics and traumatology	20	20	11	9	8
Mental hospitals	16	46	1	14	17
Rehabilitation centres	10	18	10	7	8
Other specialized hospitals	9	15	10	-	-
Non-hospital dispensaries	5	5	4	4	4

(Source: State Statistical Office 2015)

Table 22. Human resources in health facilities at secondary and tertiary level, 2015

Health facility	Total	Doctors	Doctors specialists	Dentists	Pharmacists	Health associates			Non-medical professionals
						Total	Higher education	Lower education	
TOTAL	**30467**	**5975**	**3704**	**1824**	**1029**	**1947**	**13518**	**438**	**5736**
Health stations	241	35	17	6	1	113	37	0	49
Health centres	4436	842	339	187	16	218	1920	21	1232
Non-hospital stationaries	51	3	2	0	0	2	41	5	0
Health Centre Skopje	1165	281	164	58	3	80	443	0	300
HC Zheleznicar Skopje	58	16	15	0	1	6	17	0	18
Private health facilities	9272	1914	807	1420	901	284	4578	2	173
General hospitals	4744	949	729	3	28	275	2165	187	1137
Clinical hospitals	2062	489	369	5	17	149	881	108	413
Private hospitals	1525	258	229	4	16	97	740	0	410
UC for surgical diseases “St Naum Ohridski”	343	80	61	0	1	44	150	0	68
Special ObGyn Hospital “Chair”,	182	41	29	0	1	5	82	0	53
Institute for lung diseases in children “Kozle”	199	45	31	0	0	13	91	0	50
Centres of Public Health	557	125	101	0	8	58	244	9	133
Institute of Public Health	169	33	28	0	7	54	40	0	35
University clinics	3739	744	632	0	15	406	1366	56	1152
Dental clinic	358	2	2	154	0	9	124	0	69
PHI University Dental Clinical Centre “Prof dr Bojo Andrevski”	65	0	0	43	0	5	17	0	0
Institutes within Medical Faculty and other health institutions	359	124	85	0	9	32	64	5	125
Institute for transfusion medicine	301	68	59	0	1	35	137	2	58
Special hospital for lung diseases and TB	127	25	23	0	0	7	59	7	29
Special mental health hospitals	666	58	52	1	3	52	345	16	191
Centres for rehabilitation	631	82	65	1	5	76	241	3	223
Other special hospitals	471	61	46	0	0	15	237	22	136

(Source: Institute of Public Health, 2016)

Table 23. Human resources at the Institute of Public Health (IPH) and Centres for Public Health (CPH), 2015

IPH and CPHs	Total	All doctors	Specialists	Dentists	Pharmacists	Health associates		
						Total	High school and lower education	Non-medical professionals
IPH	169	33	28	0	7	54	40	35
CPH Bitola	64	14	12	0	2	13	21	14
CPH Veles	64	16	14	0	1	5	36	6
CPH Kochani	38	10	8	0	0	3	17	8
CPH Kumanovo	59	14	12	0	2	6	26	11
CPH Ohrid	46	12	9	0	0	3	16	15
CPH Prilep	54	10	8	0	0	7	25	12
CPH Skopje	129	21	16	0	2	11	58	37
CPH Strumica	22	7	5	0	1	1	7	6
CPH Tetovo	69	12	9	0	0	5	33	19
CPH Shtip	32	9	8	0	0	4	14	5
TOTAL	746	158	129	0	15	112	293	168

(Source: Institute of Public Health, 2016)

Table 24. Number of doctors by specialisation at the Institute of Public Health (IPH) and Centres of Public Health (CPH), 2015

IPH and CPHs	Total	Specialists	Epidemiology	Hygiene	Social medicine	Microbiology	OH	GM	Surgery	IM
IPH	33	28	3	5	8	8	2	-	2	-
CPH Bitola	14	12	2	4	2	4	-	-	-	-
CPH Veles	16	14	2	5	3	3	-	1	-	-
CPH Kochani	10	8	5	1	0	2	-	-	-	-
CPH Kumanovo	14	12	4	3	2	2	-	-	-	1
CPH Ohrid	12	9	3	3	1	2	-	-	-	-
CPH Prilep	10	8	2	2	1	3	-	-	-	-
CPH Skopje	21	16	5	4	5	2	-	-	-	-
CPH Strumica	7	5	1	1	1	2	-	-	-	-
CPH Tetovo	12	9	2	3	1	3	-	-	-	-
CPH Shtip	9	8	3	2	1	2	-	-	-	-
TOTAL	158	129	32	33	25	33	2	1	2	1

(Source: Institute of Public Health, 2016) (Legend: OH = occupational health; GM = general medicine; IM = internal medicine)

Table 25. Distribution of specialists in microbiology by institutions, 2016

Institution	*Microbiology specialists*	*Ongoing specializations*
Public	**57**	**3**
IPH and CPH total	36	3
IPH	10	
CPH Skopje	2	
CPH Kumanovo	2	1
CPH Veles	4	
CPH Shtip	1	1
CPH Kochani	2	
CPH Strumica	2	
CPH Tetovo	2	
CPH Gostivar	1	
CPH Ohrid	3	1
CPH Prilep	3	
CPH Bitola	4	
Institute of Microbiology and Parasitology Skopje	13	
University Clinic for infectious diseases and febrile conditions	2	
Institute for pulmonary diseases and tuberculosis Skopje	1	
Institute for children lung diseases “Kozle” Skopje	2	
Institute of nephrology - Struga	1	
Clinical Hospital - Bitola	2	
Private	**12**	**1**
Private hospitals Lab - Sistina, Skopje	1	
Private hospitals Lab - Remedika, Skopje	1	
Private hospitals Lab - Filip II, Skopje	2	1
Private lab Avicena, Skopje	2	
Private lab Adrialab, Skopje	2	
Private lab Biotek, Skopje	1	
Private lab Royal Medica, Skopje	1	
Private lab Poliklinika, Skopje	1	
Private lab Gostivar	1	
Military Center for preventive medicine	2	
Private specializations		9
Total	**71**	**13**

(Source: survey conducted for purposes of this profile)

Annex 2: Stakeholders in HRH

Table 26. The main national stakeholders involved in the planning, production, management and regulation of human resources for health

Organization	Relevant functions
Core stakeholders	
Ministry of Health (MoH)	Responsible for all health and related issues in coordination and cooperation with other relevant ministries and authorities. Among other, responsible for professional and vocational postgraduate specialization and continuing medical education and training. (http://www.moh.gov.mk/) Works through open discussion process on advancement of health care, HRH issues included (http://zdravstvo.gov.mk/health_2020/). Stewards the health reform through various activities with national and international organisations and other stakeholders for health.
Ministry of Education and Science (MES)	Stewards and oversees educational process (under-graduate, post-graduate), including HRH. Draws up development strategies and plans, creates necessary legislation and ensures institutions are accredited according to the legally required quality standards. Organizes state public education activities and supports public education. (http://www.mon.gov.mk/)
Health Committee of the National Assembly	Advises the Parliament on health and health-related issues, and deals with health policy issues raised by stakeholders and citizens (http://www.sobranie.mk/)
State Sanitary and Health Inspectorate (SSHI)	Supervisory body of the MoH with responsibility to enforce the Law on Health Data which provides for legal basis for keeping HRH registry (http://www.moh.gov.mk/)
Agency for Quality and Accreditation of Health Care Institutions (AKAZUM)	Assessment and Monitoring of the implementation of Standards for Quality of Health Care, including standards for staff, equipment, procedures and service provision (http://akazum.gov.mk)
Health Professional Chambers	Independent professional organizations that provide professional, moral and financial protection for its members. They represent members' interests; set ethical standards; establish policy guidelines; and advise on professional issues. Chambers have strong legal powers in licensing professionals. Doctors' Chamber of Macedonia (http://lkm.org.mk) Pharmaceutical Chamber of Macedonia (http://www.fk.mk) Macedonian Dental Chamber (http://stomatoloskakomora.org)
Association of Nurses and Midwifes (ANM)	Independent professional organizations that represents members' interests; sets ethical standards; establishes policy guidelines; and advises on professional issues.
Other professional chambers and associations	Represent members' interests; set ethical standards; establish policy guidelines; and advise on professional issues: Macedonian Medical Association (http://www.mld.org.mk) Medical Students Association (http://www.mmsa.org.mk), etc.
Medical Faculty/ School for Public Health	Postgraduate training (master and PhD studies) in public health and health management (http://www.medf.ukim.edu.mk)

Organization	Relevant functions
Medical Faculties in Skopje Tetovo Shtip Medical College Bitola	Health professional education (http://www.medf.ukim.edu.mk) (http://www.unite.edu.mk) (http://vzs.ugd.edu.mk) (http://www.vmsb.uklo.edu.mk)
Dental Faculties in Skopje Tetovo Shtip	Health professional education (http://www.stomfak.ukim.edu.mk) (http://www.unite.edu.mk) (http://vzs.ugd.edu.mk)
Pharmaceutical Faculties in Skopje Shtip	Health professional education (http://www.ff.ukim.edu.mk) (http://vzs.ugd.edu.mk)
Secondary Nursing/Technician Schools (total 13)	Professional education of nurses, technicians, optic technicians, midwives, dental technicians, pharmaceutical technicians, radiology technicians (http://www.medpk.edu.mk/Default.aspx)
Other HRH related stakeholders	
Institute for Public Health (IPH)	Public health institution that maintains health registries, including HRH registry (http://iph.org.mk/)
Agency for Drugs and Medical Devices (MALMED)	Regulation and supervision of pharmaceutical products and medical aids registration and placement on the market http://zdravstvo.gov.mk/category/министерство-2/organi-vo-sostav/agencija-za-lekovi/
Directorate for E-health	Responsible for enforcement of the Law on health data, including health data collection and management (http://www.moh.gov.mk/).
Health Insurance Fund (HIF)	Administers the mandatory health Insurance and purchases health services for the insured from public and private providers (http://www.fzo.org.mk)
Institute for Occupational Health	Public Health Institution that has responsibility to advance occupational health, including health workers; WHO Collaborative Centre (http://ioh.org.mk)
Bureau for Development in Education (BDE)	Performs needs assessment in the area of education, drafts educational standards, conducts research, provides for expert consultancy to education institutions in the process of education, drafts educational curriculum. (http://www.bro.gov.mk/)
Ministry of Finance (MoF)	Plans and manages the state budget, including the budget for financing health care and education and additional education of human resources for health. (http://www.finance.gov.mk)
Ministry of Interior (MI)	Responsible for issues of migration, HRH included. (http://www.mvr.gov.mk)
Ministry of Labour and Social Policy (MLSP)	Responsible for social, labour and related issues, including HRH employment development programmes, the National Action Plan for Employment, professional education and adult training, social protection and inclusion and social care. Its National Public Agency for Employment is responsible for keeping employment data and implementing employment policies, including in the area of health (http://www.mtsp.gov.mk/)
Red Cross of Republic of Macedonia (RCRM)	Humanitarian activities; provides community services to support healthy aging of the population (http://rcrm.org.mk)

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