

Analysis of accreditation standards for undergraduate medical studies in Serbia through the lens of the National Health Workforce Accounts

Biljana Buljugic

Medicinski fakultet Univerzitet u Beogradu

Milena Santric Milicevic (✉ milena.santric-milicevic@med.bg.ac.rs)

University of Belgrade Faculty of Medicine <https://orcid.org/0000-0002-0684-359X>

Research

Keywords: accreditation; standards; quality; education; training; medical studies, planning; health workforce; health policy; National Health Workforce Accounts;

Posted Date: August 28th, 2020

DOI: <https://doi.org/10.21203/rs.3.rs-64019/v1>

License: © ⓘ This work is licensed under a Creative Commons Attribution 4.0 International License. [Read Full License](#)

Abstract

Background Understanding the importance of educational accreditation standards for health and health workforce policymaking is needed more than ever given the growing circulation of physicians, cross-border care and pandemics. The World Health Organization National Health Workforce Accounts (NHWA) for education and training could support the achievement of health care quality through health workforce strategies.

Objective To perform a qualitative and quantitative analysis of the effect of accreditation standards on undergraduate medical studies through the lens of NHWA indicators on education and training, and to assess their potential to support quality improvement in health workforce education and health policy planning.

Methods Accreditation standards for medical undergraduate studies at the Faculty of Medicine University of Belgrade, Serbia (FMUB) were analyzed using the NHWA indicators on education and training, in addition to the results of surveys of students and employers on the quality of accredited study programs in 2013 and 2016.

Results Compulsory accreditation mechanism entails standards for the quality of education at FMUB including continuing professional development and in-service training but not for interprofessional education. Standards partly cover social determinants and social accountability. Students optionally participate in regulatory making. Alike healthcare managers who also serve as providers for training placement for students during the studies, students take part in FMUB accreditation surveys. Based on the results of the survey, the quality of undergraduate medical studies at FMUB has slightly improved from 2013 to 2016. A ten-year quantitative analysis showed a declining trend in freshman enrollment. The average duration of a six-year undergraduate study of medicine is extended to 7.2 ± 0.4 years.

Conclusion For improving medical students' practical, organizational skills and independent work, as well as social accountability, and social determinants must be taken as priority standards in the future revisions of accreditation mechanism in Serbia. Health workforce organizations, civil society and the community should participate in accreditation regulatory bodies for establishing a foundation for socially accountable and interprofessional education. If implemented at institutional, local and national level, system of NHWA indicators can support the alignment of higher education standards and plans with the national health and health workforce standards and strategy/plan.

Background

Accreditation of medical institution, education and training is an important mechanism for evaluating the quality of education, but also for adjusting the learning outcomes to the potential global and local health needs. By guaranteeing that an accredited medical institution and studies are providing conditions for the production of competent medical workers, accreditation standards can assist in ensuring the quality of health care services as well as in a strategic transformation towards sustainable development of health equity in a society¹⁻³. It is especially important these standards strengthen in times of crisis, in order to reverse negative trends and avoid deepening inequities in education and development. The pandemic COVID-19 is having an adverse impact on more than 90 per cent of the world's student population⁴. It is also an opportunity for wise and visionary leaders to create such an accreditation mechanism that will enable the continuance of progress in medical education and training as well as the maintenance of study programs under equal reach for all students in urban and remote areas.

The broader concept defines accreditation as a special form of quality assurance that leads to the formal approval of an institution or program, for which a legitimate body has established that it meets predetermined and agreed-upon standards, ultimately resulting in an accredited status with the distinctive characteristic granted to that provider or program by responsible⁵. Standards of accreditation for medical studies and /or education institutions operates in a particular governmental and regulatory context, which holds main policy stakeholders for health and health workforce development accountable for matching their interests with the society needs, and lays the foundation for medical education and training and socially accountable production of health workers competent to the purpose and practice of health care in the country.

In this respect, transformation of accreditation results including competencies of medical students into the expected quality of health care is a critical strategic issue^{6,7}. Current conceptualization of the quality of healthcare performance refers to the achievement of the Universal Health Coverage (UHC)⁸ and health related milestones of the Sustainable Development Goals (SDG)⁹. The World Health Organization (WHO) has developed National Health Workforce Accounts (NHWA) with aim to support health policy performance towards achieving the quality of health care through health workforce strategies with indicators for tracking human resources for health¹⁰. NHWA is a system of 78 core indicators primarily based on the health labour market framework with tangible directions for countries health workforce policies including education and training regulation and accreditation¹⁰. This study follows the idea that accreditation standards for health workforce education as NHWA indicators are valuable for health workforce policymaking.

Accreditation of education and training was in the research focus for a few decades. Many scientists believe clear conceptualizations and definitions allow the accreditation mechanism to follow healthcare standards and the interests of the public and patients in medical education and training¹¹⁻¹³. A several systematic reviews highlighted the importance of measuring competencies within the accreditation of medical education¹⁴⁻¹⁷. For some scholars achieving excellence in medical education requires continuous improvement of the accreditation focus according to the standards of social responsibility and communication with society^{18,19}. Understanding the importance of accreditation standards for planning and policymaking for health and the health workforce is needed more than ever given the growing circulation of physicians and cross-border care²⁰⁻²³, for which central support could be an analysis of accreditation standards as indicators of NHWA.

This study objective was to perform a qualitative and quantitative analysis of the effect of accreditation standards on undergraduate medical studies through the lens of NHWA indicators on education and training, and to assess their potential to support quality improvement in health workforce education and health policy planning, using the data of the Faculty of Medicine of the University of Belgrade (FMUB) in Serbia, a middle-income country in the Europe Region.

Methods

This study includes a review of accreditation standards of the medical undergraduate studies in Serbia²⁴ through the lenses of NHWA indicators¹⁰, and a comparative analysis of the survey results among students and employers on the quality of accredited study programs at FMUB in 2013 and 2016.

The multiple-choice questionnaires for a survey of medical graduates who obtained diploma at FMUB and employers of young medical doctors who graduated at FMUB (such as the managers of the clinics of the Clinical Center of Serbia as well as of other health institutions in Belgrade) were developed by the Rulebook on Standards for Self-Evaluation and Quality Assessment of Higher Education Institutions and Study Programs adopted by the NCHE of the Republic of Serbia^{25,26}. Upon obtaining the ethical approval from the FMUB, the Quality Assurance Centre conducted surveys in written form at an occasion of the graduation ceremony at the FMUB in 2013 and in 2016. In 2013, the voluntary and anonymous survey response was collected from 58 graduates and 41 employers and in 2016 from 75 graduates and 36 employers.

Study variables

In total, 14 sets of standards for accreditation cycles in 2013 and 2016 were reviewed including the criteria on Quality Assurance Strategy, Standards and procedures for quality assurance, Quality Assurance System, Quality of the study program, Quality of the teaching process, Quality of scientific research and professional work, Quality of teachers and associates, Quality of students, Quality of textbooks, literature, library and information resources, Quality of higher education institution' management and quality of non-teaching support, Quality of space and equipment, Financing, The role of students in self-evaluation and quality control and Systematic monitoring and periodic quality control studies²⁴.

The survey among graduates in 2013 and 2016 included 17 questions with the responses on a 5-point scale (1-very bad, 2-bad, 3-good, 4-very good and 5-excellent) such as satisfaction with the study program, quality of the content of the study program, of the teaching process and general conditions of study, level of acquired knowledge and skills for completing work assignments, about the subjects, the distribution of student workloads, the compliance of the curriculum with the needs of students, the teachers attitudes, discrimination of students at the FMUB, and to name a few suggestions for improving the quality of studies.

The survey of employers covered questions about young doctors who graduated at FMUB including their preparation to complete assignments in a healthcare facility, knowledge, ability to solve practical problems, readiness for independence in work, level of organizational knowledge, work habits, ability and skill of communication, computer skills, knowledge of foreign languages, readiness for improvement, and missing competencies. Employers were asked on the methods for improvement of the quality of the study program. The responses were given on a 4-point scale (1-non-satisfactory, 2-almost non-satisfactory, 3-partially satisfactory, and 4-satisfactory).

A total of 16 NHWA (Modules 2 and 3) indicators¹⁰ were analyzed, including the standards for the duration of medical studies, accreditation mechanisms for FMUB and medical studies, standards for social accountability, standards for effective implementation of social accountability, standards for social determinants of health, standards for interprofessional education, agreement on accreditation standards, lifelong learning, continuing professional development and in-service training, duration, applications, admissions e. g. enrollments, exit / drop-out, graduation and rate (ratio of the number of graduates to the number of students enrolled in first year of the same program) and success rate (% of students graduation on time) at FMUB. A descriptive analysis (absolute and relative numbers, mean and standard deviation) of available quantitative NHWA indicators covered period from 2010/11 to 2018/2019.

Results

The standards for accreditation of medical studies at FMUB almost entirely can be used to string NHA indicators for Education and Training (Table 1). The accreditation of undergraduate medical studies at FMUB started as voluntary by the Law on Higher Education in 2005 and it becomes a compulsory later on. The National Entity for Accreditation and Quality Assurance in Higher Education of Serbia (NEQA) has accredited undergraduate medical studies as six-year integrated study program in medicine with 360 ECTS equivalents (total 5500 hours), and a list of knowledge, skills and competencies for the student to be acquired upon completion of each module curriculum, including that in the Continuing Professional Development (CPD). CPD is linked to re-licensure, however, there is a lack of a national health workforce strategy and national health policy and action plan²⁷ to align to national education plans.

Table 1

Qualitative NHTA indicators in the accreditation standards of undergraduate medical studies, MFUB Serbia 2013 and 2016

NHTA indicators Module 3¹⁰	YES/ NO /PARTLY
1. Existence of national and/or subnational standard on the duration and content of medical studies.	YES
• Are entry requirements to medical studies established concerning age, previous studies, previously acquired competence by study and past professional experience?	Standard 7
• Are the total number of hours to be spent on health workforce education and training established?	Standard 1
• Is there a list of knowledge, skills and competencies to be acquired during integrated medical studies?	Standard 1
2. Existence of national and/or subnational mechanisms for accreditation of medical studies and institutions	PARTLY
• Have national and/or subnational mechanisms for accreditation of health workforce education and training institutions and their programs been established?	Yes, by the Rulebook on accreditation of study programs brought by National Council for High Education
• Are national and/or subnational mechanisms for accreditation of health workforce education and training institutions and their programs compulsory?	Yes, in accordance to the Law on High Education
• Are there national and/or subnational mechanisms for accreditation of health workforce education and training institutions and their programs that are not compulsory?	NO
• If established, do national and/or subnational mechanisms for accreditation of health workforce education and training institutions and their programs take into account national education plans for the health workforce, as described in indicator 09_04?	NO
3. Existence of national and/or subnational standards for social accountability in accreditation mechanisms.	NO
• Is social accountability included or reflected within national and/or subnational standards?	NO
• Is there an involvement of civil society, other social stakeholders and communities in accreditation mechanisms?	NO
4. National and/or subnational standards for social accountability in accreditation mechanisms are effectively implemented.	PARTLY
• Do national and/or subnational mechanisms for accreditation of health workforce education and training institutions and their programs require compulsory reporting on implementation of national or subnational standards on social accountability?	NO
• Do the communities served by the health workforce education and training institutions participate in the decision-making of these institutions?	PARTLY in accordance to NEAQA
• Do students learn and train in the communities that the health workforce education and training institution serves (community placements)?	Yes, Standard 4
• Do health workforce education and training institutions measure their impact on the health system and populations they serve?	NO
5. Existence of national and/or subnational standards for the social determinants of health in accreditation mechanisms.	PARTLY
• Are the social determinants of health included or reflected within national and/or subnational standards?	PARTLY, in accordance with an institutional policy
• Do health workforce education and training institutions measure social determinants of health in the populations they serve?	NO
• Do health workforce education and training institutions adapt curricula according to social determinants of health in their communities?	NO
6. Existence of national and/or subnational standards for interprofessional education in accreditation mechanisms	NO
• Is interprofessional education included or reflected within national and/or subnational standards?	NO

*If YES/PARTLY a number of the national standard for accreditation and regulation is added.

NHWA indicators Module 3 ¹⁰	YES/ NO /PARTLY
7. Existence of cooperation between health workforce education and training institutions and regulatory bodies to agree on accreditation standards.	YES
• Is there a coordinating mechanism or body in place for this task?	Standard 11
• Are various stakeholders at national and institutional level involved in the coordination process?	Standard 11
• Are there institutional mechanisms in place to coordinate accreditation systems, including negotiations with relevant ministries, government agencies and stakeholders?	Standard 11
8. Existence of national systems for continuing professional development.	PARTLY
• Are there existing national and/or subnational systems for continuing professional development (CPD)?	Yes, by the Rulebook on medical chamber association (no specific standard)
• If national and/or subnational systems for CPD exist, are they compulsory?	Yes, by the Rulebook on medical chamber association (no specific standard)
• If compulsory, are they linked to re-licensure?	Yes, by the Rulebook on medical chamber association (no specific standard)
• For occupations that have a national and/or subnational system for CPD, is it integrated into national education plans for the health workforce, for that occupation (see indicator 09_04)?	NO
9. Existence of in-service training as an element of national education plans for the health workforce	YES
• Is in-service training integrated into larger national education-wide sector policies, strategies and plans?	Yes, in accordance to the Law on Health Care
• Does in-service training consider and take into account national policies, strategies and plans for transforming professional, technical and vocational education and training?	Yes, in accordance to the Law on Health Care
• Does in-service training consider and take into account national policies, strategies and plans for adult learning and higher education?	Yes, in accordance to the Law on Health Care
*If YES/PARTLY a number of the national standard for accreditation and regulation is added.	

Table 1

The structure of key regulatory bodies^{28,29} is partly socially accountable given that apart from the Chamber of Commerce, the remaining entities are policymakers and education professionals. The National Council for High Education (NCHE), the NEAQA and the Accreditation Commission with Sub-commissions report on implementation of national standards on social accountability. A coordinating body to agree on accreditation standards is NEAQA, and it coordinates accreditation systems including negotiations with relevant ministries, government agencies and various stakeholders at national and institutional level involved in the coordination process. The Government elects NCHE members of which 7 are prominent experts nominated by the Ministry of Education, Science and Technological Development, 6 are professors nominated by the Conference of Universities, 2 professors are nominated by the Conference of Academies and Colleges, 2 members are nominated by the Chamber of Commerce, while the participation of up to 2 students is optional. Similarly, the Government elects 7 members of the Steering Committee of the NEAQA (3 members nominated by the Ministry of Education, Science and Technological Development, 2 members are nominated by the Chamber of Commerce, 1 is professor nominated by the Conference of Universities, and 1 professor is nominated by the Conference of Academies and Colleges). The Accreditation Commission of NEAQA consisted of 17 members with a balanced representation of various educational and scientific fields and the gender balance.

Social determinants of health such as gender, ethnicity and disabilities are included in national and/or sub-national standards (Table 1). For example, there are special quotas for medical education for the enrollment of Roma and students with disabilities. Each year, existing curricula and teaching material may be revised and new ones may be proposed with detailed explanation on its relevance to social determinants of health in their communities.

In-service training is integrated into larger national education-wide sector policies strategies and plans considering the transforming of health professional, technical and vocational education and training such as the Law on adult education²⁹. In addition, professional networking, participation in CPD, research and project cooperation is well encouraged.

FMUB indirectly assess an impact on the health system and populations they serve through surveying the graduates (Table 2), and employer's opinion (Table 3) on the quality of accredited medical study program at FMUB, while admissions/enrollments and graduation rate were

annually monitored as was prescribed by the Law on Higher Education³⁰ (Table 4).

Table 2
Medical graduates' ratings for the quality of medical studies, MFUB, 2013 and 2016*

Aspects of the medical study program at FMUB	Respondents with positive responses (good, very good and excellent), %	
	2013 (n = 58)	2016 (n = 75)
1. Quality of the content of the study program	90	99
2. Quality of the teaching process	88	93
3. Quality of general conditions of study	86	82
4. Students' knowledge and skills for completing work assignments	81	78
5. The content of the course is coherent	85	89
6. The distribution of student workloads in the subjects is correct	73	96
7. The curriculum complies with the needs of students	81	86
8. The teachers encourage active participation of the students	73	85
9. The teachers encourage independent work of the students	76	63
10. The teacher's exam requirements were objective	83	77
11. The teacher- students relationship was professional and correct	88	100
12. Quality of teaching conditions	79	74
13. The level of teaching' tool coverage	91	89
14. Quality of textbooks	90	79
15. Availability of relevant information on the faculty's website	91	82
16. Discrimination of students at the faculty	79	75
17. Satisfaction with the study program	86	99
*The responses were given on a 5-point scale (1-very bad, 2-bad, 3-good, 4-very good and 5-excellent)		

Table 3
Employer satisfaction assessments on the competencies of medical graduates, MFUB, 2013 and 2016*

FMUB Graduates'	% of respondents partially satisfied and satisfied	
	2013 (n = 41)	2016 (n = 36)
1. Overall competencies	75.7	91.6
2. Knowledge	90.2	94.4
3. Readiness for further improvement	90.2	88.9
4. Work habits	90.2	86.1
5. Communication	97.6	80.2
6. Computer skills	100	91.7
7. English language skills	85.4	91.6
8. Ability to solve practical problems	87.8	97.3
9. Independent work	65.8	66.6
10. Organizational skills	43.8	50.77
*The responses were given on a 4-point scale (1-non-satisfactory, 2-almost non-satisfactory, 3- partially satisfactory, and 4- satisfactory)		

Table 4

Quantitative NHWA indicators (Module 2¹⁰) in the accreditation standards of undergraduate medical studies in Serbia, MFUB 2010–2018

School Year	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	x	sd
Students, n	3557	3576	3564	3867	3909	3716	3747	3821	3818	3730.6	136.3
Total											
I	710	741	724	789	753	730	707	723	772	738.8	27.9
II	646	704	779	731	785	786	807	803	766	756.3	53.2
III	607	531	560	638	590	590	652	607	601	597.3	36.6
IV	540	557	500	540	600	553	565	619	605	564.3	37.8
V	545	526	536	473	525	563	497	520	579	529.3	32.1
VI	509	517	465	696	656	494	519	549	495	544.4	78.6
Freshmen	555	588	602	604	531	556	550	560	529	563.9	28
Graduates, n	471	547	538	492	499	458	552	538	458	505.9	38.6
Graduation rate %	66.3	73.8	74.3	62.4	66.3	62.7	78.1	74.4	59.3	68.6	6.6
Success rate, %	21.4	32.6	31.3	21	14.7	21.4	32.6	31.3	32.8	26.6	6.9
Average duration of studies (years)	7.2	7.4	7.4	7.6	7.8	6.5	6.6	7.4	7	7.2	0.4
x – mean; sd -Standard deviation											

According to graduates (Table 2), the quality of medical undergraduate study programme at FMUB has improved from 2013 to 2016. In 2013, an average rate for the quality of each aspect was in the range from 3.27 ± 1.23 (aspect - students' workload) to 3.81 ± 0.97 (aspect - website information). An overall rate was 3.48 ± 0.71 . In 2016, an average rate per quality aspect was in the range from 3.33 ± 1.24 (students' independent work) to 4.17 ± 0.94 (students' workload). Students perceived that quality of studies might be improved by establishing teamwork, mentorship, introducing more practical work for better balance between the theoretical and practical lessons. Over half of respondents declared they lack practical skills, and have no interest in continuous education / training.

The satisfaction of employer with the competencies of medical graduates has increased as well (Table 3). In 2016, the survey results clearly show that the majority of employers (92%) are satisfied with the competencies of young doctors - employees in their institutions, especially with knowledge (94%), readiness for further improvement (89%), work habits (86%), communication and computer skills (81% and 92% respectively) as well as with English language skills (92%). However, the majority of employers believe that young medical doctors lack the ability to solve practical problems (58%) and for independent work (67%) as well as organizational skills (50%).

The Table 4 shows that over the ten-year period, the total number of students enrolled in all study years varied barely from the average (by 3.7%) but has an increasing trend (an overall increase of 7.3%). In the observed period, the number of all admitted to the first study year (76.4% of freshmen and 23.6% of repeated enrollments) was above the maximum accredited places (640). From 2010/2011 to 2018/2019, the number of freshmen varied for 5% from the average number, but on overall it decreased for 4.7%. It was always below the maximum of accredited places and above the available budgeted places (450) implying it includes a number of self-financing students (Table 4). The average number of students per study years was declining, resulting in 68.6% of graduation rate (or 89.8% compared to freshmen only). During the observed period, average duration of medical studies is prolonged by 1.2 year, leading to increased average number of students graduated on time - the average success rate was 26.6% (Table 4).

Discussion

This study showed the effects of accreditation standards of undergraduate medical studies at FMUB by analyzing them through the lenses of NHWA indicators. The findings show that the accreditation mechanism at FMUB, although implemented for the last fifteen years, has the

potential to support quality improvement in health workforce education, but not health care and health workforce policy planning. In 2004/2005, the FMUB initiated to a very significant extent of the process of reconciling learning outcomes and expected competencies by aligning all the elements of study programs with the Law on Higher Education and the Principles of the European Higher Education Area. The following year, standards for the accreditation of medical studies were adopted, which stipulate that all regulatory bodies are obliged not to have a conflict of interest and to have gender equality. Updates and revisions of standards in 2013 and 2016, as well as in 2019, have led to different standards focusing on quality education and training, and partly on social responsibility and addressing social determinants.

This study emphasizes the importance of improving the quality of education accreditation standards for socially accountable higher education, for which health workers, civil society and the community must participate in regulatory bodies. Students optionally participate in regulatory making. Alike healthcare managers who also serve as providers for training placement for students during the studies, students take part in FMUB accreditation surveys. While engaging the civic societies can advance academic quality and demonstrate public accountability, no precise article of the national regulations encourages greater collaboration among stakeholders and community and cultures where students after graduation and deployment will typically provide healthcare services.

The issue of community involvement in the accreditation process is also very problematic in the United States and Canada, where accreditation and regulation of higher education have a long history compared to Serbia. For instance, majority of medical schools do not include community service terms and/or descriptive language in their mission statements, and only 8.5% of medical schools incorporate community service and engagement as a primary or major criterion in promotion and tenure guidelines³¹. They have six major accreditation systems (the Liaison Committee on Medical Education; the Committee on Accreditation of Canadian Medical Schools; the Australian Medical Council; the General Medical Council; the World Federation for Medical Education; and the Conférence Internationale des Doyens et des Facultés de Médecine' Expression Française: International Association of Francophone Deans and Medical Schools) which essentially concentrate on the quality of medical education processes with variable consideration for the potential links between these processes and the development of a more efficient, equitable, and sustainable health system and the short- and long-term consequences of their programs on population health³².

Following the idea that accreditation process can significantly contribute to building competent health workforce and subsequently lead to better healthcare and meet the society' needs^{2,3,32}, the current accreditation mechanism of medical studies at FMUB must pursue for innovation, effectiveness and accountability through getting a larger input from different categories of interested parties (for instance, health care providers interested in building professional competency; students interested in acquiring the right to access an international medical license and the civic society interested in equitable access to quality services). Social accountability and social determinants and interprofessional education should be taken as priority standards in the future revisions of the regulatory accreditation mechanism. These priorities would signal a culture of continuous quality improvement of medical education is adopted and genuinely embraced in Serbia. A balanced representation of interested parties including policy-makers, education providers, health workforce labor market, students' groups and the local community could contribute to a primary goal of accreditation, that is to result in positive patient outcomes³³.

In our study, the majority of students and of employers agree that for an independent and quality work, a medical graduate would need more practical and organizational skills. Similar was found by other authors^{34,35}. Since more than 70% of students rated the level of quality of education indicators as good, very good or excellent, the main objectives of integrated academic program of medical studies prescribed by the Rulebook on the organization and conduct of integrated academic studies for obtaining the title of doctor of medicine^{36,37} were met. Given that standards and criteria of accreditation speak of the institution's ability to produce health workers who are ready to respond to the needs of society³⁸, study results added to the understanding of the advancement of the organization, the general conditions, and the quality and content of teaching process and the study program. They showed that establishing clear and well-designed standards in accreditation process yields opportunity, firstly, to measure the impact of accreditation process introduced into to legal framework of Republic of Serbia by the Law in Higher Education³⁰, and secondly, to improve that process by continuous self-evaluation, also proscribed by the Law and other provisions defined by NEAQA²⁶.

This study methods is limited in terms of measuring the impact of accreditation of medical study program on the quality of health care and subjective opinion of the respondents might contribute to over and underestimation of findings. No conclusion can be borne on causal relationship, rather short-term changes in the accreditation process were measured through reactions to the educational experience of graduates and employers³⁹. Since the socio-economic determinants impact on health progress globally and nationally⁴⁰, the surveys in future should be aiming to cover larger sample of graduates and students with a different socio-economic background.

A true impact of accreditation may well rest in the ability to promote continuous quality improvement within medical education institutions⁴¹, trough integration with health and health workforce strategies/plans^{4,8-10,23,38}.

Despite verified slight improvement in quality of medical undergraduate study program at FMUB from 2013 to 2016, other NHWA indicators showed reducing interest in medical studies. Over the ten-year trend there is an overall decline of freshmen enrollment. A significant share of re-

enrollments and a success rate of less than 30% both were inducing a prolonged duration of medical studies. These indicators are important to support justification of certain study programs and the required number of students as foreseen by the new regulation⁴². Given the emigration tendencies and a high unemployment rate of health workers^{43,44}, only with a new national strategy / plan for health care and health workforce, Serbia will be able to adequately regulate the future of higher medical education at five universities. FMUB, as one that has a third of all medical students in the country with about twenty thousand active doctors in the public sector, itself produces about 2.5% of new doctors per year. However, this study findings are also limited due to absence of exact data on applications and exist/drop outs. Future studies should explore these aspects in student's cohort data.

Study showed that accreditation standards requiring alignment of health workforce education with national health plan and health workforce strategy can assist in coordinating policies on production of human resources for health toward achievement United Nations SDG 3 - health related goals as well as SDG 4 - Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all⁹. If continuously monitored, validated and recorded into the central database on health workforce (e.g. national health workforce information system) NHWA indicators informs evidence-based policy decisions according to country needs through identifying significant improvements in transformation and scale-up of HWF education and training in support of UHC and increase ability to guide and intersectoral policy dialogue among the relevant ministries that may include those of education, health and finance¹⁰.

Conclusion

The accreditation mechanism at FMUB has the potential to support quality improvement in health workforce education, but are not sufficient for policy planning for health care and health workforce. Study findings indicate that improving medical students' practical, organizational skills and independent work, as well as social accountability and social determinants must be taken as the priority of FMUB. The participation of students, health workforce organizations, civil society and the local community in accreditation regulatory bodies, mechanism and standards of undergraduate medical studies is necessary for Serbia to confirm the commitment of an accredited institution' to improving the quality of higher medical education and compliance with quality of healthcare. Furthermore, the study emphasizes that socially accountable medical education requires the implementation of the NHWA indicators at the national level, which shows the harmonization of higher education standards and plans with national standards and the health care strategy / plan.

References

1. Marmot M, Bell R (2018) The sustainable development goals and health equity. *Epidemiology* 29(1):5–7. Available at <https://doi.org/10.1097/EDE.0000000000000773> [accessed 05/08/2020].
2. UNESCO (2015) Unleashing the Potential- Transforming Technical and Vocational Education and Training, [online], available: <http://unesdoc.unesco.org/images/0023/002330/233030e.pdf> [accessed 05/08/2020].
3. World Health Assembly (2013) 'World Health Assembly resolution 66.23: Transforming health workforce education in support of universal health coverage', available: http://apps.who.int/gb/ebwha/pdf_files/WHA66/A66_R23-en.pdf [accessed 24/08/2020].
4. Secretary-General Report, 2020. Progress towards the Sustainable Development Goals, available at: <https://undocs.org/en/E/2020/57> [accessed 10 August 2020]
5. UNESCO (2012) UNESCO Guidelines for the recognition, validation and accreditation of the outcomes of non-formal and informal learning, UNESCO [online], available: <http://unesdoc.unesco.org/images/0021/002163/216360e.pdf> [accessed 05/08/2020].
6. Cox M. 2016. Reflections. Presented at the workshop: The Role of Accreditation in Enhancing Quality and Innovation in Health Professions Education. April 22. Washington, DC.
7. Phillips SD 2017. Accreditation: realities, challenges, and opportunities. In: National Academies of Sciences, Engineering, and Medicine. 2017. Exploring the role of accreditation in enhancing quality and innovation in health professions education: Proceedings of a workshop. Washington, DC: The National Academies Press. doi: 10.17226/23636.
8. WHO (2017) 'Universal Health Coverage', [online], available: http://www.who.int/healthsystems/universal_health_coverage/en/ [accessed 24/08/2020].
9. UN General Assembly. Transforming our world: the 2030 Agenda for Sustainable Development, 21 October 2015, A/RES/70/1, available at: <https://www.refworld.org/docid/57b6e3e44.html> [accessed 05/08/2020].
10. National health workforce accounts: a handbook. Geneva: World Health Organization; 2017. Licence: CC BY-NC-SA 3.0 IGO.
11. Kassebaum DG, Eaglen RH, Cutler ER. The meaning and application of medical accreditation standards. *Acad Med.* 1997;72(9):808-818. doi:10.1097/00001888-199709000-00019.
12. Innes SI, Cope V, Leboeuf-Yde C, Walker BF. A perspective on Chiropractic Councils on Education accreditation standards and processes from the inside: a narrative description of expert opinion: Part 1: Themes. *Chiropr Man Therap.* 2019;27:57. doi:10.1186/s12998-019-0275-

13. Innes SI, Cope V, Leboeuf-Yde C, Walker BF. A perspective on Councils on Chiropractic Education accreditation standards and processes from the inside: a narrative description of expert opinion: Part 2: Analyses of particular responses to research findings. *Chiropr Man Therap.* 2019;27:56. doi:10.1186/s12998-019-0276-5.
14. Lurie SJ, Mooney CJ, Lyness JM. Measurement of the general competencies of the accreditation council for graduate medical education: a systematic review. *Acad Med.* 2009;84(3):301-309. doi:10.1097/ACM.0b013e3181971f08.
15. Innes SI, Leboeuf-Yde C, Walker BF. Similarities and differences of a selection of key accreditation standards between chiropractic councils on education: a systematic review. *Chiropr Man Therap.* 2016;24:46. doi:10.1186/s12998-016-0127-6.
16. Mohieldein AH. Outcome-based approach to medical education towards academic programmes accreditation: A review article. *J Pak Med Assoc.* 2017;67(3):454-460.
17. Faucett EA, Barry JY, McCrary HC, Saleh AA, Erman AB, Ishman SL. Otolaryngology Resident Education and the Accreditation Council for Graduate Medical Education Core Competencies: A Systematic Review. *JAMA Otolaryngol Head Neck Surg.* 2018;144(4):360-370. doi:10.1001/jamaoto.2017.3163.
18. Lindgren S, Karle H. Social accountability of medical education: aspects on global accreditation. *Med Teach.* 2011;33(8):667-672. doi:10.3109/0142159X.2011.590246.
19. Yoo HH, Kim MK, Yoon YS, et al. Change of accreditation standards of medical schools by the Korean Institute of Medical Education and Evaluation from 2000 to 2019. *J Educ Eval Health Prof.* 2020;17:2. doi:10.3352/jeehp.2020.17.2.
20. Karle H. Global standards and accreditation in medical education: a view from the WFME. *Acad Med.* 2006;81(12 Suppl):S43-S48. doi:10.1097/01.ACM.0000243383.71047.c4;
21. Gibbs T, McLean M. Creating equal opportunities: the social accountability of medical education. *Med Teach.* 2011;33(8):620-625. doi:10.3109/0142159X.2011.558537.
22. National Academies of Sciences, Engineering, and Medicine; Health and Medicine Division; Board on Global Health; Global Forum on Innovation in Health Professional Education. *Exploring the Role of Accreditation in Enhancing Quality and Innovation in Health Professions Education: Proceedings of a Workshop.* Washington (DC): National Academies Press (US); October 5, 2016.
23. Singh Y, Roehr CC, Tissot C, et al. Education, training, and accreditation of Neonatologist Performed Echocardiography in Europe- framework for practice. *Pediatr Res.* 2018;84(Suppl 1):13-17. doi:10.1038/s41390-018-0078-9.
24. Rulebook on standards for self-evaluation and quality assessment of higher education institutions. *Off. Gazette RS.* 2006:106.
25. National Council for Higher Education (NCHE). The Rulebook on Standards for Self-Evaluation and Quality Assessment of Higher Education Institutions and Study Programs, Official Gazette Republic of Serbia 2019:13. Available at: <https://www.nat.rs/pravilnici/> [accessed 05/08/2020].
26. National Entity for Accreditation and Quality Assurance in Higher Education of Serbia, available at <https://www.nat.rs> [accessed 05/08/2020].
27. World Health Organization (WHO). Regional Office for Europe, European Observatory on Health Systems and Policies, Bjegovic-Mikanovic V, Vasic M, Vukovic D, Jankovic J, Jovic Vranes A, Santric Milicevic M, Terzic Supic Z, Hernandez-Quevedo C. (2019). Serbia: health system review. World Health Organization. Regional Office for Europe. <https://apps.who.int/iris/handle/10665/331644> [accessed 05/08/2020].
28. Education, Audiovisual and Culture Executive Agency (EACEA). Overview of the Higher Education System. Erasmus+ Office in Serbia. Brussels: European Union, 2017 available at 2020 https://eacea.ec.europa.eu/sites/eacea-site/files/countryfiche_serbia_2017.pdf [accessed 05/08/2020].
29. Law on Adult Education, *Off. Gazette RS.* 2013:55, 2017:88, 2018:27 -and 2020:6.
30. Law on Higher Education. *Off. Gazette RS.* 2017: 88; 2018:73; 2018:27- other law, 2019:67 and 2020:6.
31. Goldstein A, Bearman R. Community engagement in US and Canadian medical schools, Source: *Advances in Medical Education and Practice.* 2011; 2: 43–49.
32. Boelen C, Blouin D, Gibbs T, Woollard R. Accrediting excellence for a medical school's impact on population health. *Education for Health.* 2019;32(1): 41-48.
33. Huggan PJ, Samarasekara DD, Archuleta S, et al. The successful, rapid transition to a new model of graduate medical education in Singapore. *Acad Med.* 2012;87(9):1268-1273. doi:10.1097/ACM.0b013e3182621aec.
34. Im S, Kim DK, Kong HH, Roh HR, Oh YR, Seo JH. Assessing clinical reasoning abilities of medical students using clinical performance examination. *Korean J Med Educ.* 2016;28(1):35-47. doi:10.3946/kjme.2016.8.
35. Maguire P, Fairbairn S, Fletcher C. Consultation skills of young doctors: II—Most young doctors are bad at giving information. *Br Med J (Clin Res Ed).* 1986;292(6535):1576-1578. doi:10.1136/bmj.292.6535.1576.

36. Faculty of Medicine University of Belgrade. Rulebook on the organization and conduct of integrated academic studies for obtaining the title of doctor of medicine 2019. http://med.bg.ac.rs/wp-content/uploads/2017/06/2_PRAVILNIKIASMAJ2019.pdf?script=lat, [accessed 05/08/2020].
37. National Standards for accreditation of I and II-degree programs – Standard 3, Goals of the study program of Integrated studies of medicine 2014, Available at: www.med.bg.ac.rs, [accessed 05/08/2020].
38. WHO (World Health Organization). 2013. Transforming and scaling up health professional education and training: Policy brief on accreditation of institutions for health professional education. Geneva, Switzerland: WHO.
39. Kirkpatrick, D. L. 1994. Evaluating training programs: The four levels. 1st ed. San Francisco, CA: Berrett-Koehler Publishers, Inc.
40. Söderberg S. ISO 26000 and the SDGs. Geneva: International Organization for Standardization, 2018.
41. Blouin D, Tekian A. Accreditation of Medical Education Programs: Moving From Student Outcomes to Continuous Quality Improvement Measures, Source: Academic Medicine 2018;93(3):377-383.
42. Rulebook on standards for self-evaluation and quality assessment of higher education institutions and study programs. Off. Gazette RS. 2019:13
43. Santric Milicevic M, Vasic M, Edwards M. Mapping the governance of human resources for health in Serbia. Health Policy. 2015, 119(12):1613-1620.
44. Santric-Milicevic MM, Terzic-Supic ZJ, Matejic BR, Vasic V, Rickets TC First- and fifth-year medical students' intention for emigration and practice abroad: A case study of Serbia. Health Policy. 2014;118(2):173-183.