

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

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## Research

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## Abstract

**Background** Understanding the importance of educational accreditation standards for health workforce policymaking is needed more than ever, given the growth of physicians' shortage, circulation, cross-border care. The World Health Organization National Health Workforce Accounts (WHO-NHWA) for education and training could support medical education accreditation goals.

**Objective** The aim of the study was to show the compliance of the Serbian national accreditation standards for undergraduate medical education with the WHO-NHWA indicators for accreditation of education and training of the health workforce. The study highlights the relevance of education accreditation to health workforce development.

**Methods** Based on a review of the official documents, laws, and regulations for national accreditation of medical studies in Serbia, we described the current accreditation standards of the most prominent faculty of medicine in Serbia, the Faculty of Medicine University of Belgrade (FMUB), and compared them with the WHO-NHWA indicators on education and training.

**Results** The national accreditation standards partly match the WHO-NHWA indicators for accreditation of education and training. National standards concentrate on education quality while overlooking social determinants of health and social accountability. Over the last nine years, the freshmen enrollment has a downward trend, and the average duration of a six-year undergraduate study of medicine was  $7.2 \pm 0.4$  years.

**Conclusion** Social accountability and social determinants must be priority standards in future accreditation. Health workforce organizations, civil society, and the community should participate in regulatory bodies for accreditation to establish the appropriate basis for socially accountable and interprofessional education. If applied at the institutional, local, and national levels, the WHO-NHWA indicator system can support medical studies' alignment with the strategy/plan of the health care and health workforce development.

## Background

Accreditation of medical institutions, education, and training is an essential mechanism for evaluating the quality of studies and adjusting health workforce development to the potential global and local health needs. By guaranteeing that an accredited medical institution and studies provide conditions for the production of competent medical workers, accreditation standards can assist in ensuring the quality of health care services and a strategic transformation towards sustainable development of health equity in a society<sup>1-3</sup>. These standards must strengthen in crisis times to halt or reverse negative trends and avoid deepening inequities in education and development. The pandemic COVID-19 is having an adverse impact on more than 90 percent of the world's student population<sup>4</sup>. It also brings 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 and the maintenance of study programs under equal reach for all students in urban and remote areas.

In a broader sense, the accreditation is a particular 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<sup>5</sup>. Accreditation of medical studies and educational institutions function in exceptional management and regulatory context, which holds the main actors in health care and health workforce development responsible for its alignment with society's needs. The accreditation and regulation data and indicators for health workforce education of the World Health Organization (WHO) - National Health Workforce Accounts (NHWA) lay the foundation for establishing, monitoring, evaluating, and leading the production of medical workers fit for purpose and practice at a country level.

In this respect, the translation of accreditation standards into the expected quality of health care and health is a strategic challenge<sup>6,7</sup>. The current conceptualization of the quality of health and health care refers to the milestones of the health-related Sustainable Development Goals (SDG)<sup>8</sup> and the Universal Health Coverage (UHC)<sup>9</sup>. The WHO has developed NHWA to support health policy performance towards achieving the quality of health care through health workforce strategies with indicators for tracking human resources for health<sup>10,11</sup>. The WHO-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 accreditation<sup>10,11</sup>. The WHO-NHWA indicators for regulation and accreditation of health workforce education<sup>10,11</sup> enable monitoring education policies, setting priorities, objectives, and actions regarding the community's health workforce needs. This study follows the idea that WHO-NHWA indicators are valuable lenses for reviewing accreditation and policymaking in undergraduate medical education.

Over the decades, the accreditation of education and training research's focus was to clarify conceptualizations and definitions to allow the accreditation mechanism to follow health care standards and the public and patients' interests in medical education and training<sup>12-14</sup>. A few systematic reviews highlighted the importance of measuring competencies within the accreditation of medical education<sup>15-18</sup>. Scholars recognize that achieving excellence in medical education requires continuous improvement of the accreditation standards of social

responsibility and communication with society<sup>19-23</sup>. Additionally, the accreditation has expanded to cover health care facilities conditions, work processes, management, including employee training and learning outcomes<sup>24-29</sup>. Better coordination of the accredited education with other health workforce development dimensions for expected improvement of health outcomes remained the challenge<sup>6,7,15,17,23,25,29,30</sup>. Understanding the importance of educational accreditation standards for health workforce policymaking is needed more than ever, given the growth of physicians' shortage, circulation, and cross-border care<sup>3,11,31</sup>. Raising stakeholder awareness of the importance of education regulations and accreditation standards for health workforce policy and planning and the gradual alignment of national standards with the WHO-NHWA can be central incentives. To be able to heighten the stakeholder and professional sensitivity in that direction, we analyzed national standards through the lens of the WHO-NHWA indicators specific to medical studies' accreditation and regulation.

The aim of the study was to show the compliance of the Serbian national accreditation standards for undergraduate medical education with the WHO-NHWA indicators for accreditation of education and training of the health workforce. The study highlights the relevance of education accreditation to health workforce development.

## Methods

The study is conducted at the most prominent medical faculty in Serbia, a middle-income country of the Western Balkan<sup>32</sup>, the Faculty of Medicine University of Belgrade (FMUB). The study unit is the 2019 set of national accreditation standards for undergraduate medical studies. Based on a review of the official documents, laws, and regulations for national accreditation of medical studies in Serbia, we described the current accreditation standards of FMUB and compared them with the WHO-NHWA indicators on education and training<sup>10,11</sup>. To supplement the study findings, we undertook the descriptive analysis of the production of medical doctors at FMUB for the school year period 2010/11-2018/9.

The inclusion criteria in the review were the general or specific correspondence of the official and business documentation to the accreditation process of integrated academic studies of medicine at FMUB. Finally, we reviewed the eight documents of the regulatory bodies and agencies that proscribe conditions of accreditation processes directly at higher education institutions in Serbia from 2005 to 2020, including the Law on Higher Education<sup>33</sup> (articles 10-25), the Law on Adult Education<sup>34</sup>, the Law on Health Care<sup>35</sup>, brought by the National Parliament of the Republic of Serbia, the Rulebook on Accreditation Standards for Study Programs<sup>36</sup> brought by the National Council for Higher Education, the Statute of FMUB<sup>37</sup>, the Rulebook on the organization and conduct of integrated academic studies for obtaining the title of doctor of medicine at FMUB<sup>38</sup>, the Rulebook on the continuous medical education of the Ministry of Health<sup>39</sup> and the internal document reporting the evaluation of standards implementation in 2019<sup>40</sup>.

This study has three sets of variables that were observed and described: national accreditation standards, WHO-NHWA indicators, and variables of the production of medical doctors included in the 2010/11-2018/9 analysis.

The first set of variables includes 14 national accreditation standards proscribed by the Rulebook on Accreditation Standards for Study Programs<sup>36</sup>. Each standard consists of a descriptive part that provides information on the particular focal point and documents that prove the fulfillment of requirements. The standards are the following: 1. Structure of the study program; 2. Purpose of the study the program; 3. Goals of the study program; 4. Competencies of graduated students; 5. The curriculum of the study program, 6. Quality and harmonization with other international programs; 7. Conditions of enrollment; 8. Grade policy and students' advancement through the program; 9. Teaching staff; 10. Technical Resources; 11. Quality control; 12. Study program in a foreign language; 13. Joint study program (e.g., postgraduate program); and 14. Interdisciplinary, multidisciplinary, and transdisciplinary study program (e.g., postgraduate program, or Continuing Professional Development - CPD).

The second set of variables included nine WHO-NHWA indicators from Module 3 Education and training regulation and accreditation<sup>11</sup>. These indicators are the following: the standards for the duration of medical studies, accreditation mechanisms for FMUB and medical studies, criteria 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.

The third set of variables were the WHO-NHWA indicators Module 2 on education and training<sup>10</sup> applied in a descriptive analysis (absolute and relative numbers, mean and standard deviation) to show the enrollment, duration of studies, and graduation from FMUB over the school years 2010/11 to 2018/2019. The following seven variables are the average duration of medical studies, applications, admissions, e.g., enrollments, exit/dropout, graduation, and graduation rate (the ratio of the number of graduates to the number of students enrolled in the first year of the same program) and success rate (% of students graduating on time) at FMUB.

## Results

In Serbia, mandatory accreditation for higher education was introduced in 2005 by the Law on Higher Education<sup>33</sup>. This law has established the Commission for Accreditation and Quality Assurance (CAQA) as an independent body of the National Council for Higher Education, the only official body responsible for implementing quality control procedures in Serbia. CAQA has developed accreditation standards mainly using the European higher education area experiences and directives and in collaboration with European Association for Quality Assurance in Higher Education<sup>41,42</sup>. The standards for accreditation of study programs and higher education institutions are uniform for all, regardless of the educational field or institution type. In 2017, the Law on Higher education had enacted significant accreditation regulation changes in the higher education area by introducing the new accreditation agency, so-called the National entity for certification and quality control in higher education (NEAQC)<sup>43</sup>, as the legal successor of CAQA. This body has undertaken several activities to change accreditation rules and standards to meet the European standards and guidelines<sup>41,42</sup>. The changes were especially in strengthening independence and the role of review commissions by including representatives of students and the economy in their work, involvement of foreign experts in the evaluation process, the realization of visits of review commissions, etc. In that way, a new methodology for conducting the accreditation procedure and external verification in higher education has been created<sup>44</sup>. Since 2005, FMUB has passed two accreditation cycles in 2009 and 2014 and has started a new one in 2019.

The mapping between national accreditation standards, including national and institutional regulation and legislation, and the WHO-NHWA indicators for accreditation and regulation of education (Module 3) is presented in Table 1 and shows incomplete compliance (i.e., yes, standards exist; partial, some standards exist; no, no standards).

In full compliance are standards for the duration and content of education and training, agreement on accreditation standards, interprofessional and in-service training. The National Entity for Accreditation and Quality Assurance in Higher Education of Serbia (NEAQA)<sup>43</sup> has accredited undergraduate medical studies as a six-year integrated study program in medicine with 360 *European Credit Transfer and Accumulation System* (total 5500 hours per Directive 2005/36/EC<sup>41,42</sup>). It also accredited the set of knowledge, skills, and competencies a student should acquire upon completing each module curriculum, including that in the CPD linked to the re-licensure<sup>39</sup>. In-service training is integrated into larger national education-wide sector policy, strategies, and plans such as the Law on Adult Education<sup>34</sup>. Also, professional networking, participation in CPD, research, and project cooperation are well encouraged<sup>38</sup>.

We found partial compliance with standards for social determinants of health and lifelong learning. Also, the CPD and the agreement on national standards are not integrated into the national education plan for doctors, according to indicator 09\_04. The WHO-NHWA indicator 09\_04 talks about harmonizing the national education plan with the national health plan and the national health workforce strategy/plan. The harmonization ensures matching the competencies of doctors with the population, health systems, and health market needs, scaling up transformative education and training, and strategic consideration of market needs labor and absorption capacity<sup>45</sup>. These health workforce policy dimensions are lacking because Serbia has no strategy for health workforce development.<sup>32</sup>

Social determinants of health such as gender, ethnicity, and disabilities are partially included in national and/or sub-national standards (Table 1). Since 2016, there is an enrolment quota for students from vulnerable populations such as Roma students<sup>46</sup> or students from third world countries<sup>47</sup>.

Undergraduate medical studies in Serbia lack standards similar to the WHO-NHWA regarding social accountability. The National Council for High Education (NCHE), the NEAQA, and the Accreditation Commission with Sub-commissions should report on the implementation of national standards on social accountability<sup>48</sup>. A coordinating body to agree on accreditation standards, NEAQA negotiates with relevant ministries, government agencies, and various stakeholders at the national and institutional level involved in the coordination process. The Government elects the NCHE<sup>36</sup>, the Steering Committee, and the Accreditation Commission of the NEAQA<sup>32</sup>. Since the structural changes in 2019, mandatory members of these bodies are policymakers, professors from various academic disciplines, experts in different education fields, representatives of the Chamber of Commerce, while the students' participation is discretionary<sup>36,38,41</sup>. The improvement in students' participation has been made by establishing the University Students' Conference and Students' Conference of Academies of Vocational Studies and Colleges for the purpose of realization of their interests as partners in the higher education area. However, their role is limited to a certain extent in the accreditation process<sup>33</sup>.

The analysis of the WHO-NHWA indicators on education and training showed that over the ten years, the total number of students enrolled in all study years varied barely from the average (by 3.7%) but has an increasing trend with an overall increase of 7.3% (Table 2). 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 by 5% from the average number, but overall, it decreased by 4.7%. It was always below the maximum of accredited places and above the available budgeted places (450), implying some self-financing students (Table 2). The average number of students per study year was declining, resulting in a 68.6% of graduation rate (or 89.8% compared to freshmen only). During the observed period, the average duration of medical studies is prolonged by 1.2 years, leading to an increased average number of students who graduated on time - the average success rate was 26.6% (Table 2).

## Discussion

The study found partial compliance between the Serbian national accreditation standards and the WHO-NHWA indicators for health workers' education and training. Highlighted are the shortcomings that national accreditation in Serbia needs to overcome to foster the alignment of the medical doctors' education and the community's sustainable health development. This study emphasizes the importance of standards for socially accountable higher education, for which the participation of civil society, community, and stakeholders such as health care providers and students in regulatory bodies is necessary. While engaging the civic societies can advance academic quality and demonstrate public accountability, no particular article of the national regulations encourages greater collaboration among stakeholders and community and cultures where students will typically work after graduation. Students optionally participate in regulatory making and take part in accreditation surveys. The issue of community involvement in the accreditation process is also very problematic in the United States and Canada, where higher education accreditation and regulation have a long history compared to Serbia. For instance, most 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 the promotion and tenure guidelines<sup>49</sup>. The six major accreditation systems in these countries (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<sup>50</sup> 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 health<sup>49</sup>.

Following the idea that the accreditation process can significantly contribute to building a competent health workforce and subsequently lead to better health care and meet society' needs<sup>3,50,51</sup>, the current accreditation mechanism of medical studies at FMUB and in Serbia must pursue innovation, effectiveness, and accountability through getting a more extensive input from different categories of interested parties. Health care providers and students are interested in providing input to building professional competency and acquiring the right to access an international medical license<sup>40</sup>, while the voice of civic society is needed to enhance equitable access to quality services.

The findings show that the accreditation mechanism at FMUB does not have standards that support the alignment of education and health workforce policy and planning. The Health Care Law (Articles 19, 161, and 163)<sup>35</sup> stipulates that personnel plans must be harmonized with health care coverage plans' standards and norms. The same law (Article 173)<sup>35</sup> stipulates that the plan for the development of personnel in health care is adopted by the Minister of Health, with the consent of the ministry responsible for education and based on funds provided for those purposes, since that plan contains goals and objectives of education and professional development. However, Serbia does not have an official strategy and plan for health workforce development.

It is also a legislative lever for the health workforce development to discuss upgrading the system of indicators for accreditation of medical studies. In previous years, standards for quality of education and training are mainly updated and revised, while social responsibility and social determinants are partly. The 2019 national accreditation standards for health workers' education in Serbia and evaluation reports are general, concentrating on teaching quality, technical elements, and conditions<sup>36,40</sup>. Neither the accreditation body nor the standards have a voice from the community. Though mandatory, the quota for students from Roma and other vulnerable populations was not mentioned in accreditation. We believe that standards specific to medical education, such as the WHO-NHWA indicators, should be used to upgrade national accreditation standards. Social accountability and social determinants should be priority standards in future regulatory accreditation. 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, health organizations, students' groups, and the local community, might be a success factor contributing to a primary goal of accreditation, resulting in positive patient outcomes<sup>51</sup>.

This study was conducted to provide recommendations for the new accreditation cycle and highlight its importance for health workers' strategic development. The analysis of WHO-NHWA quantitative indicators for education and training at FMUB has shown a reduced interest in medical studies. Over the ten-year, there is an overall decline in freshmen enrollment. A significant share of re-enrollments and a success rate of less than 30% have induced a prolonged duration of medical studies. Given the emigration tendencies and a high unemployment rate of health workers<sup>52,53</sup>, these indicators are essential because they justify the required budget for the study program and students' number. FMUB is the

largest of five universities in Serbia and annually produces a third of all medical students in the country<sup>32</sup>, i.e., about 2.5% of active medical doctors in the public sector. The exact and complete data on students' applications and exits/dropouts were not available in the FMUB databases, indicating the study findings' limitation. The study has not assessed the quality of learning outcomes and health care of the accredited medical studies at FMUB.

Based on the notion that accreditation standards and criteria speak of the institution's ability to produce health workers who are ready to respond to the needs of society<sup>50</sup>, study results added to the understanding of the necessary advancement of the national accreditation system. Establishing clear and well-designed standards in the accreditation process creates an opportunity to impact the policy and planning of health workforce development for better community health. A true impact of accreditation may well rest in the ability to promote continuous quality improvement within medical education institutions<sup>44</sup> through integration with health care and health workforce strategies/plans<sup>3</sup>.

This study shows a novel approach for assessing medical studies' national accreditation standards by examining their compliance with the WHO-NHWA indicators. In future studies, interviews with key stakeholders and exploration of best practices could help resolve missing indicators and standards. The study showed that aligning accreditation standards for medical doctors' education with national health care and health workforce strategy is required. That alignment can help coordinate health workers' production toward achieving the United Nations SDG 3 - health-related goals and SDG 4 - Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all<sup>8</sup>. The WHO-NHWA indicators can inform evidence-based policy decisions according to country needs through identifying significant improvements in transformation and scale-up of health workforce education and training in support of UHC. It also can enable intersectoral policy dialogue among the relevant ministries of education, health, labour, employment, and finance<sup>10,11</sup>. A prerequisite is a continuous collection, validation, and documentation of WHO-NHWA data and indicators in national accreditation standards for education and the national workforce information system.

## Conclusion

The national accreditation standards of medical studies partly comply with the WHO-NHWA indicators. Study findings indicate that upgrading standards for social accountability and social determinants of medical studies must be the priority of FMUB. The participation of students, the health workforce, health organizations, civil society, and the local community in the accreditation is necessary to confirm an accredited institution is committed to improving the quality of medical education in Serbia. The study emphasizes that full implementation of the WHO-NHWA indicators at the national level could support the development of accredited medical studies' social accountability and alignment of the higher education with the strategy/plan of national health care and health workforce.

## Declarations

**Ethics approval and consent to participate:** Not applicable.

**Consent to publication:** Not applicable.

**Data availability:** All data generated or analysed during this study are included in this published article.

**Competing interests:** The authors declare that they have no competing interests

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**Authors' contributions:** MSM conceptualised and designed the study. BB designed the study and conducted data collection and data analysis, carried out a literature review, and wrote the initial draft of the study report. MSM carried out data analysis, a literature review, and provided overall technical guidance in the conceptualization and design of the study and report writing. Both authors read and approved the final manuscript. Both authors are the first authors

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## Tables

**Table 1 Mapping the WHO-NHWA indicators in the accreditation standards of undergraduate medical studies, 2019**

<b>NHWA indicators Module 3<sup>10</sup> Education and Training Regulation and Accreditation</b>	<b>Yes / Partial / No compliance - standards (reference)</b>
<b>3-01 Standards for the duration and content of education and training</b>	<b>Yes</b>
<i>Indicator: Existence of national and/or subnational standard on the duration and content of medical studies</i>	
· Are entry requirements to medical studies established concerning age, previous studies, previously acquired competence by study and past professional experience?	Yes - Standard 7 <sup>36</sup>
· Are the total number of hours to be spent on health workforce education and training established?	Yes - Standard 1 <sup>36</sup>
· Is there a list of knowledge, skills and competencies to be acquired during integrated medical studies?	Yes - Standard 1 <sup>36</sup>
<b>3-02 Agreement on accreditation standards</b>	<b>Partial</b>
<i>Indicator: Existence of national and/or subnational mechanisms for accreditation of health workforce education and training institutions and their programs</i>	
· Have national and/or subnational mechanisms for accreditation of health workforce education and training institutions and their programs been established?	Yes - the Rulebook on accreditation of study programs of the National Council for Higher Education <sup>36</sup>
· Are national and/or subnational mechanisms for accreditation of health workforce education and training institutions and their programs compulsory?	Yes - the Law on Higher Education <sup>33</sup>
· Are there national and/or subnational mechanisms for accreditation of health workforce education and training institutions and their programs that are not compulsory?	No - no standards
· 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 - no standards
<b>3_03 Standards for social accountability</b>	<b>No</b>
<i>Indicator: Existence of national and/or subnational standards for social accountability in accreditation mechanisms</i>	
· Is social accountability included or reflected within national and/or subnational standards?	No - no standards
· Is there an involvement of civil society, other social stakeholders and communities in accreditation mechanisms?	No - no standards
<b>3_04 Standards for social accountability effectively implemented</b>	<b>Partial</b>
<i>Indicator: National and/or subnational standards for social accountability in accreditation mechanisms are effectively implemented.</i>	
· 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 standards
· Do the communities served by the health workforce education and training institutions participate in the decision-making of these institutions?	No standards
· Do students learn and train in the communities that the health workforce education and training institution serves (community placements)?	Yes - Standard 4 <sup>36</sup>
· Do health workforce education and training institutions measure their impact on the health system and populations they serve?	No standards
<b>3_05 Standards for social determinants of health</b>	<b>Partial</b>
<i>Indicator: Existence of national and/or subnational standards for the social determinants of health in accreditation mechanisms.</i>	
· Are the social determinants of health included or reflected within national and/or subnational standards?	Partial - FMUB policies <sup>37,38</sup>
· Do health workforce education and training institutions measure social determinants of health in the populations they serve?	No standards
· Do health workforce education and training institutions adapt curricula according to social determinants of health in their communities?	No standards
<b>3_06 Standards for interprofessional education</b>	<b>Yes</b>

<i>Indicator: Existence of national and/or subnational standards for interprofessional education in accreditation mechanisms</i>	
· Is interprofessional education included or reflected within national and/or subnational standards?	Yes - Standard 14 <sup>36</sup>
<b>3_07 Agreement on accreditation standards</b>	<b>Yes</b>
<i>Indicator: Existence of cooperation between health workforce education and training institutions and regulatory bodies to agree on accreditation standards.</i>	
· Is there a coordinating mechanism or body in place for this task?	Yes - Standard 11 <sup>36</sup>
· Are various stakeholders at national and institutional level involved in the coordination process?	Yes - Standard 11 <sup>36</sup>
· Are there institutional mechanisms in place to coordinate accreditation systems, including negotiations with relevant ministries, government agencies, and stakeholders?	Yes - Standard 11 <sup>36</sup>
<b>3_08 Continuous professional development</b>	<b>Partial</b>
<i>Indicator: Existence of national systems for continuing professional development.</i>	
· Are there existing national and/or subnational systems for continuing professional development (CPD)?	Yes - the Rulebook on continuous education of the Ministry of Health <sup>39</sup>
· If national and/or subnational systems for CPD exist, are they compulsory?	Yes - the Rulebook on continuous education of the Ministry of Health <sup>39</sup>
· If compulsory, are they linked to re-licensure?	Yes - the Rulebook on continuous education of the Ministry of Health <sup>39</sup>
· 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 standards
<b>3_09 In-service training</b>	<b>Yes</b>
<i>Indicator: Existence of in-service training as an element of national education plans for the health workforce</i>	
· Is in-service training integrated into larger national education-wide sector policies, strategies, and plans?	Yes - the Law on Health Care <sup>35</sup>
· Does in-service training consider and take into account national policies, strategies, and plans for transforming professional, technical, and vocational education and training?	Yes - the Law on Health Care <sup>35</sup>
· Does in-service training consider and take into account national policies, strategies, and plans for adult learning and higher education?	Yes - the Law on Health Care <sup>35</sup> , Law on Higher Education <sup>33</sup> and Law on Adult Education <sup>34</sup>

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

*\*\* Indicator 09\_04. Existence of national education plans for the health workforce, aligned with the national health plan and the national health workforce strategy/plan.<sup>45</sup>*

**Table 2. WHO -NHWA indicators (Module 2) of undergraduate medical studies in Serbia, FMUB, 2010/11-2018/19**

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