Changing dental profession in the WHO European region: analysis of the organization and education framework

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Objectives: The study examines the impact of changes on dental education and practice in Europe, including the development of new practice models such as investor-owned dental centers and practice chains. **Method and materials:** This study aimed to collect and critically examine data regarding the care environment, education, and organizational structures of the dental profession across European Regional Organization of the FDI World Dental Federation (ERO) member states and other countries in the World Health Organization European region. A questionnaire from the ERO was used. **Results:** National dental associations across 45 countries participated. An average of 1,459.79 (SD ± 800.80) inhabitants per dental practitioner was found, with independent practices being the most prevalent form of dental practice (48.65% ± 28.28%) followed by employment in private practice (24.32% ± 20.33%), and joint practices (15.27% ± 20.39%). There are statistically significantly more state universities than private universities ($P < .01$); the percentage of females attending dental schools was statistically significantly higher than males ($P < .01$). Two-thirds of the participating countries (n = 30, 66.67%) have legal frameworks allowing various stakeholders, including investors, and local communities, to establish dental health care centers. **Conclusions:** The findings highlight the evolving landscape of the dental profession in Europe and its regulatory context. There is a clear need for ongoing evaluations and adjustments in educational and practice frameworks to ensure and maintain high-quality oral health care. Future research should delve into the various professional dental practice forms and incorporate qualitative, care-related, and patient-centered considerations for a more thorough understanding of Europe's oral health care dynamics. *(Quintessence Int 2024;55:744–755; doi: 10.3290/j.qi.b5714883)*

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Over the last two decades, dental education and the practice of dentistry in Europe have changed significantly due to changes in the legal framework.[1-3] Factors influencing this change include advancing globalization, but also technological innovations, and a changing health policy agenda with an increasing trend towards digitalization and sustainability.[2] Due to the liberalization of the health care market in many European countries, both in the European Union and the World Health Organization (WHO) European Region, it has been possible for several years to work as a dental practitioner in new forms of dental practice, such as multi-dentist practices, practice networks, and dental health care centers.[3]

Opportunities and challenges of liberalization

An increase in diversified practice forms such as multi-dentist practices, dental health care centers, and investor-operated practice chains can be observed.[1,4-6] However, these developments not only offer opportunities but also pose a challenge for oral health care within the various European health care systems.[6] So far, hardly any harmonized data on health indicators or health system-related indicators are available. The liberalization of the health care market has led to a wider availability of oral health care services, but also to concerns about the quality of patient care.[6] The structural and legal framework for the practice

of dentistry varies considerably between European countries. This has a direct impact on access and quality of oral health care.

Harmonization efforts and legislative changes

Although the European Union is striving to increase the harmonization of European health and social systems in the sense of a European Health Union, a further step has been taken with the creation of the European Health Data Space.[7] However, health is organized by the nation-states themselves. Since the legislative introduction of the possibility of setting up health care centers in dentistry, originally also to counteract potential rural undersupply, and the possibility of setting up dental health care centers by non-dentists, municipalities, health insurers, and companies in various European countries, the establishment of such centers, particularly in the suburbs of large cities, and the associated possible overtreatment in urban areas, investment efforts by private equity investors and the associated progressive commercialization have been reported.[8]

Regional demands and workforce shortages

Nevertheless, there are also reports of a strong regional increase in demand for dental practitioners and a severe shortage, for example in the United Kingdom (UK), particularly in the National Health Service.[9] Despite the number of dental practitioners on the General Dental Council register being at record levels, workforce shortages are seen as one of the main reasons for the lack of access to dental services in the UK.[9,10] While there are reports of an oversupply of dental practices in various countries, such as Spain, Portugal, and Romania, there is also a shortage of specialists in Ireland, for example.[10] Although around 50% of Irish university graduates now come from the Far East or Canada, there is a shortage of around 500 dental practitioners in Ireland, which would lead to 2-year waiting lists for treatment under general anesthesia.[10] However, even in large, industrialized nations such as France or Germany, shortages in oral health care have been documented in various regions, especially in rural areas. In Europe as a whole, however, the number of dental graduates has increased over the last 20 years.[11-13] In contrast, there has been a demographic problem for years with many older dental practitioners, some of whom have retired even earlier due to the SARS-CoV-2/COVID-19 pandemic, exacerbating the crisis.[14,15] In the last two decades, the French population has grown by more than 10%, while the number of trained dental practitioners has only increased by 4%.[15] To counteract the impending shortage of dentists, the French government abolished the so-called numerus clausus, a cap on the number of medical and dental students, in 2020. However, it will still take several years for the additional students to obtain their degrees.[15] Other funding options, some of which have already been implemented in medicine, include the establishment of additional new dental faculties at some universities and monthly scholarships for students who agree to practice for at least 2 or more years in a defined undersupplied area.[15,16] Potential overtreatment or undersupply in both urban and rural areas is critical to the oral health care of people.

Study objectives

The study serves to reevaluate the general conditions of a dental practitioner's organization, forms of occupation, and dental education within the European Regional Organization of the FDI World Dental Federation (ERO)[17] and the countries of the WHO European Region[18] to analyze the care situation of the dental profession regarding the current situation in the participating countries. The present study aims to document a detailed picture of the current supply situation of the dental profession, dental education, and the structural organization of the dental profession in Europe and to critically discuss necessary measures to preserve the integrity of the profession and ensure and maintain high-quality oral health care.

Method and materials

Study design and data collection

A questionnaire in English was planned as a cross-sectional evaluation in 2015 and was developed by the ERO Working Group "Liberal Dental Practice."[3] To reexamine the supply situation of the dental profession and dental education after 8 years, the previously validated questionnaire was sent to the contact persons of the participating countries in the WHO European Region in December 2022, who had until April 2023 to collect all the information and return the questionnaire. In total, these were dental associations in 34 ERO member countries and 11 non-ERO member countries within the WHO European Region (see Fig 1). The questionnaire could be completed online using the Lime Survey website for a period of 5 months from December 2022 to April 2023. The Lime Survey website was used to collect the data and store the results. The addressed contact persons of the national dental associations were reminded to complete the questionnaire by two emails from the ERO Secretariat.

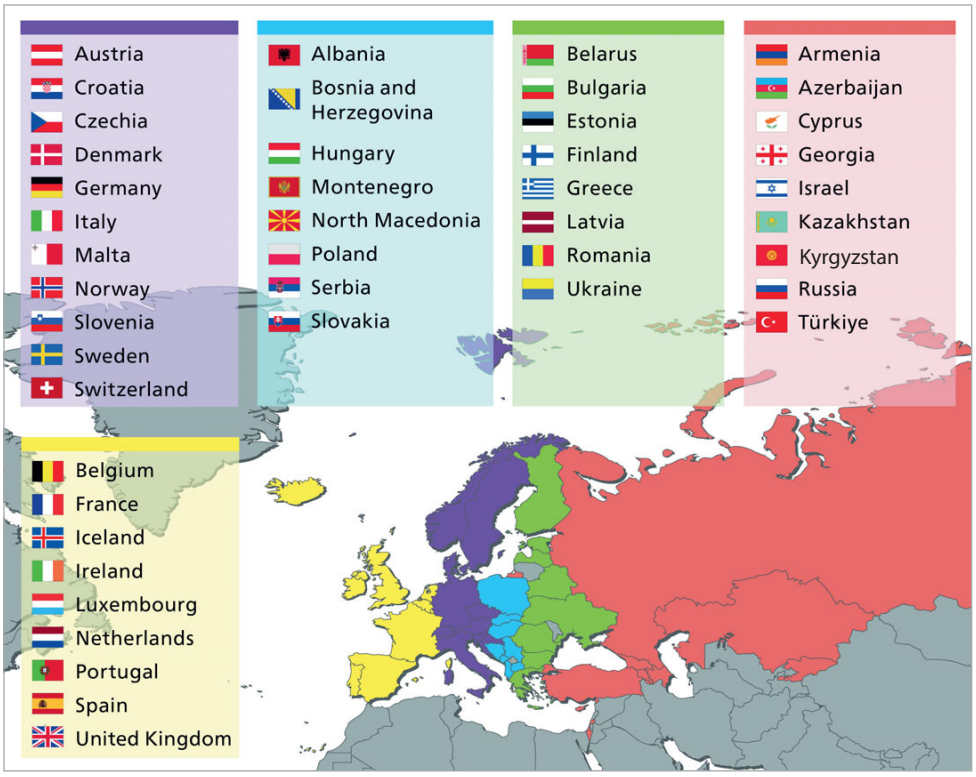

Fig 1 Map of participating countries sorted by color from west to east (yellow, purple, blue, green, and red).

Composition of the questionnaire

The survey consisted of various items on the organization and framework conditions of the dental profession and dental education and a total of three parts:

- Part 1: Questions on education with information on the number of graduates, duration of study, types, and number of dental faculties (state and private), sex distribution of dental students.
- Part 2: Questions on the organization of dental practitioners, regulations for dental practices and dental health care centers as well as on dental care in urban and rural areas, whereby information was collected such as the number of dental practitioners in the country, proportion of clinicians who are members of a dental organization, self-employed dental practice immediately after graduation, place of residence, legal requirements for setting up a dental care center, number of dental practitioners allowed to work in a dental care center, over- or under-supply of dental practitioners, and changes in the ratio of the number of practices in urban and rural areas over the last 10 years.
- Part 3: Questions about legal regulations for the establishment of a dental health care center.

Dental care rate and working environment of dental practitioners

The dental care rate of the participating countries was determined using data from the World Data Bank from 2021 as a basis for the population size of the respective countries (see Fig 2).[19] In addition, the working environment of the dental practitioners was determined and divided into private practice (self-employed), employed in a private practice or group practice, dental health care center, municipal/state clinic, university clinic, public health system, industry, or other locations (see Fig 3).

Data analysis

Data were coded and imputed into an Excel 2021 spreadsheet (Microsoft) for Macintosh (Apple) and checked to verify the accuracy. Descriptive and analytic statistical analysis were performed using parametric (two-tailed *t* test) or nonparametric (chi-square test) when appropriate.

Results

A total of 45 countries took part in the study (Fig 1), of which 34 are currently members of the ERO and 11 non-ERO member

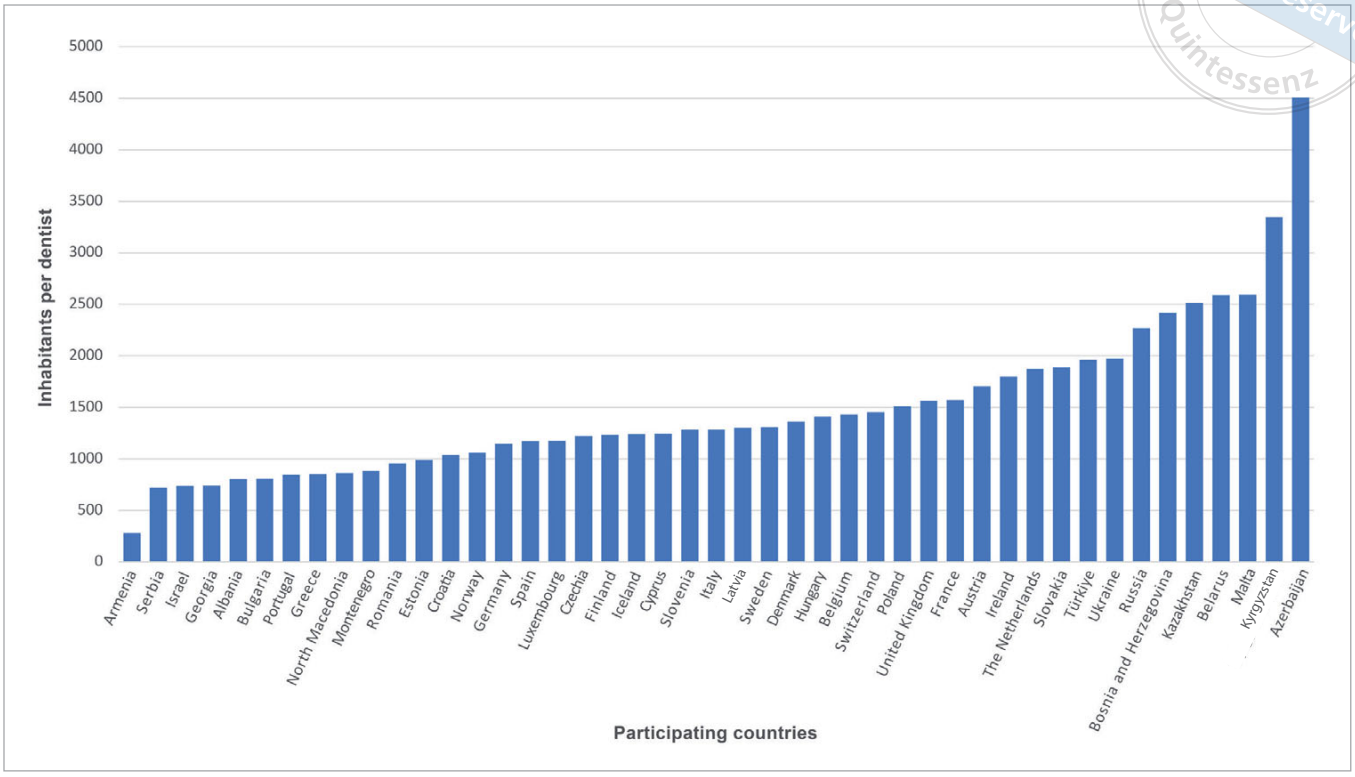

Fig 2 Dental care rate of the participating countries.

countries. The participating countries were Albania, Armenia, Austria, Azerbaijan, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Kazakhstan, Kyrgyzstan, Latvia, Luxembourg, Malta, Montenegro, Netherlands, North Macedonia, Norway, Poland, Portugal, Romania, Russia, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye, Ukraine, and the United Kingdom.

Figure 2 illustrates the dental practitioner density, ie, how many inhabitants there are per practitioner in each country. On average (mean ± standard deviation [SD]), the dental practitioner density was 1459.79 ± 800.80.

Figure 3 shows information on the various forms of dental practice. The breakdown is as follows: Self-employed in a private dental practice (48.54% ± 28.28%), employed in a private dental practice (24.32% ± 20.33%), employed in a group/joint practice (15.27% ± 20.39%), regional, state or municipal clinic (8.98% ± 17.86%), university hospital (4.90% ± 6.82%), part of a dental health care center (6.61% ± 14.19%), public health system (13.76% ± 20.17%), industry (0.36% ± 0.78%), or other locations (2.78% ± 5.63%).

Within the ERO countries, independent dental practice is the most common form of dental practice. In eight countries, including Albania, Armenia, Bosnia and Herzegovina, Denmark, Georgia, Montenegro, Norway, and Portugal, most dental practitioners are employed in a private practice (> 38%). In the Netherlands and Serbia, dental practitioners are mainly organized in group practices (> 45%). In Kazakhstan, most dental practitioners are employed in a dental health care center (50%). Regional and community clinics are common in the ERO countries in only two nations, ie, Kyrgyzstan (65%), Sweden (52%), and Russia (50%). In all countries surveyed, the average was less than 5% of dentists working at a university clinic, except for Austria, Bosnia & Herzegovina, North Macedonia, Russia, Türkiye, and Serbia. In the public health sector, Belarus has the highest employment rate (62%), followed by Slovenia (62%), Ukraine (58%), Finland (56%), Norway (29%), Türkiye (27%), and Azerbaijan (27%), and Bosnia and Herzegovina (23%). In the remaining countries, the employment rate is below 10%. The rarest working environment within the countries surveyed is the industrial environment (eg, pharmaceuticals or consultants for manufacturers of dental products) (0% to 3%). The category "Other" includes all other

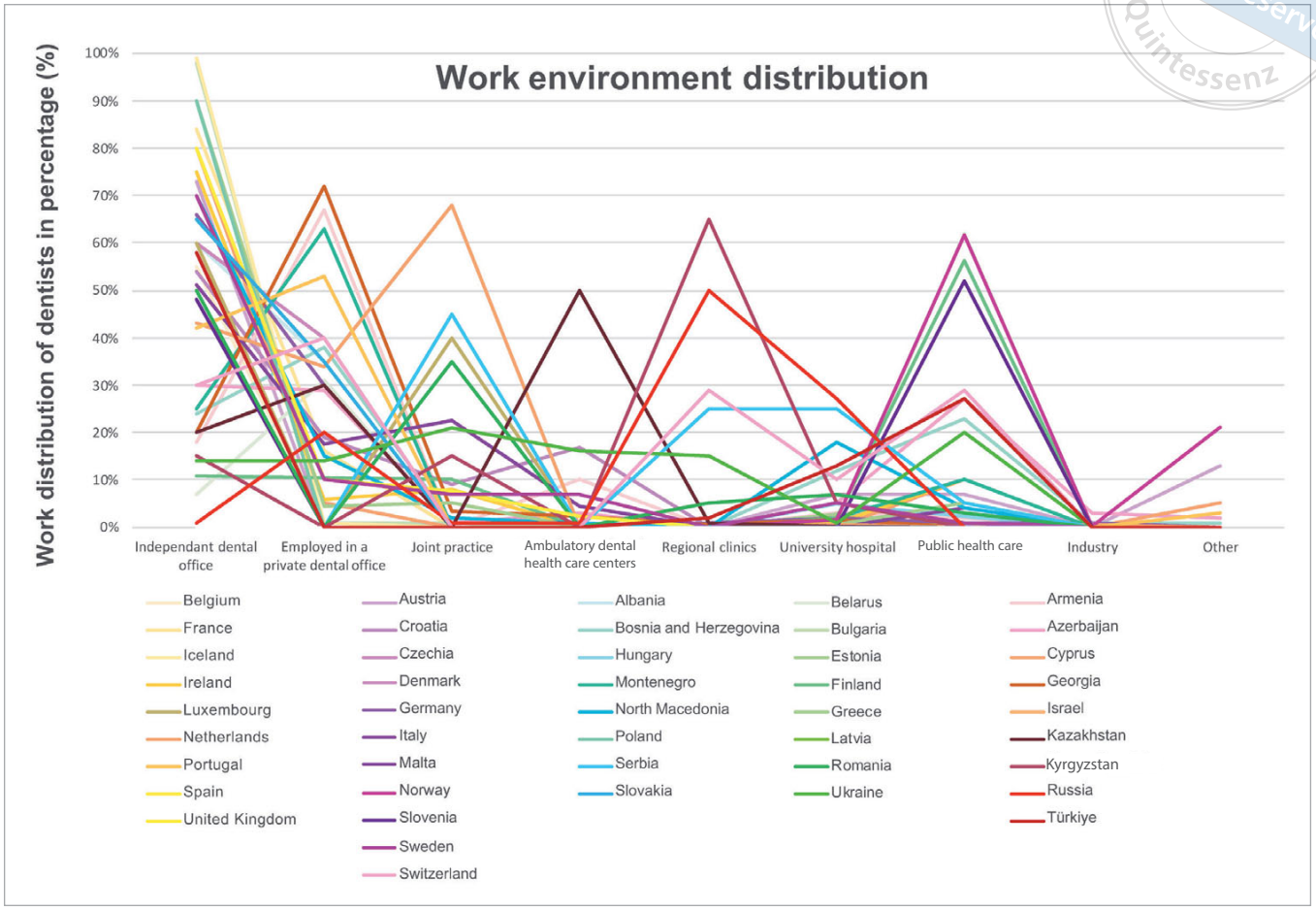

Fig 3 Working environment of dental practitioners in private practice (self-employed), employed in a private practice or group practice (joint practice), (ambulatory) dental health care center, regional (community/state) clinic, university hospital, public health system, industry, or other locations. The participating countries are sorted by color from west to east (yellow, purple, blue, green, and red) in accordance with Fig 1.

possibilities for dental work, eg, as an assessor for insurance companies, and other areas. "Other" was mainly given by Slovenia (21%) and Austria (13%) and the remaining ERO member states with less than 5% of dental practitioners.

The data presented in Table 1 show how long it takes to study dentistry, how many dental graduates there are, the sex distribution of students, and the distribution between private and public universities within a state. Within all participating countries, most dental faculties are public (n = 375, 79.96%), 20.04% are private (n = 94). In almost all countries surveyed, there were statistically significantly more state universities than private universities ($P < .01$); the ratio was balanced only in Slovenia and Spain. Private dental universities were more strongly represented than state universities in Albania, Armenia, Georgia, Kyrgyzstan, Portugal, and Cyprus. There were more female than male dental students across all countries (63.63%). A balanced ratio was found in Armenia, Belarus, Cyprus, Kazakhstan, and Kyrgyzstan. There were slightly more male than female students (> 54%) in Italy, Montenegro, and Türkiye. The percentage of females attending dental schools was statistically significantly higher than males ($P < .01$).

Table 2 shows the organization of dental practitioners in each country, as well as their regulations for practicing the profession. Compulsory membership of a chamber exists in 14 of the 45 countries (31.11%) and mandatory membership of a national dental association exists in 5 of the 45 countries that took part in the study (11.11%). Table 2 also shows the percentage of dental practitioners who were members of a chamber or professional dental association. The mean value across all countries was 80.85%. The number of national dental associations varied greatly from country to country. This is an important factor because dental organizations play an important role as stakehold-

Table 1 Number of graduates, duration of studies, forms and quantities of dental schools, and sex distribution

Country	Number of graduates	Duration of study (y)	Forms and quantity of dental faculties		Sex distribution of dental students	
			State	Private	Female (%)	Male (%)
Albania	350	5	1	5	60.00	40.00
Armenia	800	5	1	5	50.00	50.00
Austria	230	6	3	0	53.00	47.00
Azerbaijan	200	5	1	0	60.00	40.00
Belarus	290	5	2	0	50.00	50.00
Belgium	280	5	5	0	70.00	30.00
Bosnia and Herzegovina	260	6	8	4	60.00	40.00
Bulgaria	400	5.5	3	NA	66.00	34.00
Croatia	175	6	4	1	82.00	18.00
Cyprus	45	5	0	1	50.00	50.00
Czechia	250	5	5	0	90.00	10.00
Denmark	125	5	2	0	75.00	25.00
Estonia	34	5	1	0	80.00	20.00
Finland	175	5.5	4	0	72.00	28.00
France	1,332	6	16	0	60.00	40.00
Georgia	1,200	5	4	11	65.00	35.00
Germany	1,800	5.5	29	1	67.00	33.00
Greece	220	5	2	0	52.00	48.00
Hungary	210	5	4	0	64.00	36.00
Iceland	8	6	1	0	88.00	12.00
Ireland	70	5	2	0	60.00	40.00
Israel	107	6	2	0	58.00	42.00
Italy	1,000	6	32	2	34.00	66.00
Kazakhstan	600	6	8	0	50.00	50.00
Kyrgyzstan	525	5	3	4	50.00	50.00
Latvia	60	5	2	0	80.00	20.00
Luxembourg	NA	NA	0	0	NA	NA
Malta	20	5	1	0	NA	NA
Montenegro	21	6	1	0	46.00	54.00
Netherlands	220	6	3	NA	68.00	32.00
North Macedonia	120	5	3	2	65.00	35.00
Norway	116	5	3	0	67.00	23.00
Poland	900	5	10	0	80.00	20.00
Portugal	3,840	5	3	4	NA	NA
Romania	1,600	6	11	2	70.00	30.00
Russia	1,850	5	64	1	64.00	36.00
Serbia	181	6	2	1	70.00	30.00
Slovakia	113	6	4	0	66.40	33.60
Slovenia	50	6	1	1	71.50	28.50
Spain	1,950	5	12	12	64.00	36.00
Sweden	267	5	4	0	60.00	40.00
Switzerland	130	5	4	0	68.00	32.00
Türkiye	4,171	5	75	29	44.00	56.00
Ukraine	960	5	13	8	65.00	35.00
United Kingdom	1,000	5	16	0	57.50	42.50

NA, not available/not applicable

ers and service providers in dental care. In almost all countries surveyed, except Azerbaijan and Finland, there was no restriction on how many dental practitioners could work in a dental health care center. In most countries, practitioners were allowed to work independently directly after graduation (57.78%), in 15 countries this was not permitted (33.33%). In addition, in

Table 2 Organization of dental practitioners, regulations for dental practice and dental health care centers, and oral health care in urban and rural areas

Country	Chamber	National dental association	No. of dental practitioners in the country	Percentage of dental practitioners who are members of a dental organization (%)	Legal requirements for the foundation of an ambulatory health center	No. of dental practitioners allowed to work in a dental health care center	Self-reliant dental work possible immediately after graduation	Residency		Over- or undersupply of dental practitioners		Changes in the ratio of the no. of practices in urban and rural areas in the last 10 years
								Mandatory	Duration (mos)	In urban region	In rural regions	
Albania	Yes, mandatory	Yes	3,500	100.00	Yes	NA	No	Yes	12	Yes	Yes	Yes
Armenia	No	Yes	10,000	100.00	Yes	NA	No	NA	NA	No	No	Yes
Austria	Yes, mandatory	NA	5,256	100.00	Yes	NA	Yes	NA	NA	No	No	Yes
Azerbaijan	Yes	Yes	2,250	26.20	Yes	3–8	Yes	NA	NA	Yes	Yes	NA
Belarus	NA	Yes	3,605	41.10	Yes	NA	No	Yes	36	Yes	Yes	No
Belgium	No	NA	8,100	0.00	No	NA	NA	NA	NA	Yes	Yes	No
Bosnia and Herzegovina	Yes	No	1,354	100.00	No	NA	No	Yes	6	No	Yes	No
Bulgaria	NA	Yes, mandatory	8,540	100.00	Yes	NA	Yes	No	0	Yes	No	No
Croatia	Yes, mandatory	Yes	3,754	100.00	Yes	NA	Yes	No	0	No	NA	NA
Cyprus	NA	Yes, mandatory	1,000	100.00	Yes	NA	Yes	No	0	Yes	Yes	No
Czechia	NA	Yes	8,600	100.00	NA	NA	NA	NA	NA	NA	NA	NA
Denmark	No	Yes	4,300	85.00	No	NA	No	Yes	12	Yes	Yes	Yes
Estonia	No	Yes	1,346	83.20	Yes	NA	No	No	0	No	Yes	Yes
Finland	NA	Yes	4,500	95.60	Yes	5	No	No	0	Yes	No	Yes
France	Yes, mandatory	Yes	43,134	100.00	Yes	NA	No	No	0	Yes	No	No
Georgia	NA	NA	5,000	73.00	NA	NA	NA	NA	NA	NA	NA	NA
Germany	Yes, mandatory	Yes, mandatory	72,468	100.00	Yes	NA	No	Yes	24	Yes	Yes	NA
Greece	No	Yes, mandatory	12,500	100.00	No	NA	Yes	No	0	Yes	Yes	No
Hungary	Yes, mandatory	Yes	6,894	100.00	Yes	NA	Yes	No	0	Yes	Yes	No
Iceland	No	Yes	300	98.30	Yes	NA	Yes	No	0	Yes	Yes	NA
Ireland	Yes	Yes	2,800	64.30	NA	NA	Yes	No	0	Yes	Yes	NA
Israel	NA	Yes	12,690	59.10	Yes	NA	Yes	No	0	No	No	Yes
Italy	Yes, mandatory	Yes	46,000	67.40	Yes	NA	Yes	No	0	Yes	Yes	No
Kazakhstan	NA	Yes	7,560	35.90	Yes	NA	Yes	NA	NA	Yes	No	Yes
Kyrgyzstan	Yes	Yes	2,000	9.30	Yes	NA	No	Yes	NA	Yes	Yes	Yes
Latvia	No	Yes, mandatory	1,450	100.00	Yes	NA	Yes	No	0	Yes	Yes	Yes
Luxembourg	Yes, mandatory	Yes	545	61.80	NA	NA	Yes	No	0	Yes	Yes	Yes
Malta	Yes, mandatory	Yes	200	85.00	NA	NA	Yes	No	0	NA	NA	NA
Montenegro	Yes, mandatory	No	699	99.60	Yes	NA	No	Yes	6	No	Yes	Yes
Netherlands	No	Yes	9,360	87.80	Yes	Unlimited	Yes	No	0	Yes	Yes	NA
North Macedonia	Yes, mandatory	NA	2,400	100.00	NA	NA	Yes	No	0	Yes	Yes	No
Norway	No	Yes	5,100	100.00	No	NA	Yes	No	0	Yes	Yes	NA
Poland	Yes, mandatory	Yes	25,000	100.00	Yes	NA	No	Yes	12	NA	Yes	NA
Portugal	NA	Yes	12,235	100.00	Yes	NA	Yes	NA	NA	Yes	Yes	Yes
Romania	Yes	Yes	20,000	100.00	No	NA	Yes	No	0	Yes	Yes	No
Russia	NA	Yes	63,200	46.30	NA	NA	NA	NA	NA	NA	NA	NA
Serbia	Yes	Yes	9,500	99.53	Yes	NA	No	Yes	6	Yes	Yes	No
Slovakia	Yes	NA	2,887	100.00	Yes	NA	Yes	No	0	Yes	Yes	Yes
Slovenia	Yes, mandatory	Yes	1,643	130.31	Yes	NA	No	Yes	12	Yes	No	NA
Spain	Yes	NA	40,462	100.00	Yes	NA	Yes	No	0	Yes	Yes	Yes
Sweden	NA	Yes	7,973	63.21	NA	NA	Yes	No	0	Yes	Yes	NA
Switzerland	No	Yes	6,000	70.00	No	NA	No	Yes	24	Yes	No	No
Türkiye	Yes	Yes	43,199	79.52	Yes	NA	Yes	No	0	NA	Yes	Yes
Ukraine	No	Yes	22,180	40.58	Yes	NA	Yes	Yes	36	Yes	Yes	Yes
United Kingdom	Yes, mandatory	Yes	43,000	36.05	Unknown	NA	Yes	Yes	12	Yes	Yes	NA

NA, not available/not applicable.

Albania, Belarus, Bosnia and Herzegovina, Denmark, Germany, Kyrgyzstan, Montenegro, Poland, Serbia, Slovenia, Switzerland, Ukraine, and the UK, there is a mandatory residency period in dental practice. The duration of this residency varies between 6 and 36 months. This is required to be allowed to set up the own dental practice or to practice the profession under their own professional responsibility. The information on oversupply and undersupply in urban and rural areas was heterogenous in all participating countries, as was the information on changes over the last 10 years.

The data presented in Table 3 show that there are legal regulations governing who may establish a dental health care center. In two-thirds of the participating countries (66.67%), there is legal regulation for the establishment of dental health care centers (66.67%). Dental practitioners (73.33%), investors without medical or dental training (64.44%), medical doctors (64.44%), local municipalities (62.22%), business companies (48.89%), health insurance (46.67%), or others (13.33%) are allowed to establish a dental health care center.

Discussion

The present study aimed to collect information on the dental care situation in European countries. It was intended to close the information gap, as little data are currently available on this subject, and to serve as a basis for further research and the development of measures to identify problems and improve dental care. The effects of the various changes on the dental profession should be better understood so that political decision-makers can respond appropriately in terms of needs and care policy. The study provides data on the specific duration and type of dental education, the sex distribution among students, the types and number of dental schools, the organization of dental practitioners, and regulations for dental practice in ERO-member countries and other countries in the WHO European Region. The findings from the extensive survey of 45 countries provide valuable insights into the different models of dental practice and their regulatory environment. These insights are crucial in responding to educational and professional policy issues arising from the rapidly changing dental sector.

Regarding the study of dentistry, it is evident that most dental schools in ERO member states are state-run, which also reflects the dominance of state universities. In most countries, there are more state universities than private universities, apart from Slovenia and Spain. The duration of studies is homogenous across Europe, with 5 to 6 years of study, but the structure of the curricula is also of central importance as it directly influences the quality of education and thus the employability of graduates.[20,21] The autonomy of academic educational institutions, whether public or private, and also the available financial and infrastructural resources of dental faculties, strategies, or even formal mentoring programs present additional challenges and opportunities for the educational system.[22] A comprehensive analysis of these aspects is crucial to understanding and optimizing the effectiveness and efficiency of dental education and practice assessment. Female dental students predominate at 61.67% across all countries, with a sex balance found in some countries. The data confirm the general trend of increasing feminization of the dental profession.[23] The increasing number of women in dentistry requires measures to promote sex diversity, more flexible working conditions for a better work–life balance, sex-sensitive training, and targeted promotion of women in leadership positions.[23]

A variety of working environments in the dental profession exists in the European countries surveyed. However, independent practices are still the most common form of practice, followed by employment in private practices and group practices. Dental health care centers are particularly popular in Kazakhstan. University clinics and industrial environments are less common. Employment rates in the public health care sector are high in some countries. The diversity reflects different needs and structural differences. Comparative analyses between individual countries are useful to better understand differences in dental practice and their impact on health care systems and to optimize patient care.

The analysis of the data presented shows that in most of the participating countries, there is legal regulation for the establishment of dental health care centers. Interestingly, the right to establish such centers is not exclusively limited to dental practitioners, but also other actors such as investors without medical or dental training, physicians, local communities, health care companies, and health insurance companies can establish such centers in some countries. These findings raise questions about the influence of different actors on the structure and quality of dental care in dental health care centers and the impact on patient care and competition in the health care system.[6] Further research in this area could help evaluate the effectiveness of current regulatory practices and develop recommendations for the optimal design of the regulatory framework for dental health care centers. Greater harmonization of these regulations could potentially help to improve the quality and accessibility of oral health care across Europe. In the future, EU-wide standardization of regulations could lead to a guarantee of quality of care regardless of location.

Table 3 Legal regulations for the establishment of a dental health care center

Country	Who may establish a dental health care center?							Legal regulation for establishment of dental health care centers
	Investors without a dental or medical education	Dental practitioners	Medical doctors	Local municipalities	Health insurances	Business companies	Others	
Albania	Yes	Yes	Yes	Yes	Yes	Yes	NA	Yes
Armenia	Yes	Yes	Yes	Yes	No	Yes	NA	Yes
Austria	NA	NA	NA	NA	NA	NA	NA	Yes
Azerbaijan	Yes	Yes	Yes	NA	Yes	NA	NA	Yes
Belarus	Yes	Yes	Yes	Yes	No	NA	NA	Yes
Belgium	Yes	Yes	Yes	Yes	Yes	Yes	NA	No
Bosnia and Herzegovina	No	Yes	Yes	No	No	No	NA	No
Bulgaria	No	Yes	No	No	No	No	NA	Yes
Croatia	Yes	Yes	NA	Yes	Yes	Yes	NA	Yes
Cyprus	NA	NA	NA	NA	NA	NA	NA	Yes
Czechia	NA	NA	NA	NA	NA	NA	NA	NA
Denmark	Yes	Yes	NA	Yes	NA	NA	NA	Yes
Estonia	Yes	Yes	Yes	Yes	Yes	Yes	NA	Yes
Finland	No	Yes	Yes	Yes	Yes	No	Yes	Yes
France	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
Georgia	NA	NA	NA	NA	NA	NA	NA	NA
Germany	No	Yes	Yes	Yes	No	No	Yes	Yes
Greece	NA	NA	NA	NA	NA	NA	NA	No
Hungary	Yes	Yes	Yes	Yes	Yes	Yes	NA	Yes
Iceland	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ireland	NA	NA	NA	NA	NA	NA	NA	NA
Israel	Yes	NA	NA	NA	NA	NA	NA	Yes
Italy	No	Yes	Yes	Yes	No	No	No	Yes
Kazakhstan	Yes	Yes	Yes	Yes	Yes	Yes	NA	Yes
Kyrgyzstan	Yes	Yes	Yes	Yes	NA	NA	NA	Yes
Latvia	Yes	Yes	Yes	Yes	Yes	Yes	NA	Yes
Luxembourg	No	No	No	No	No	No	No	NA
Malta	Yes	Yes	Yes	Yes	Yes	Yes	NA	NA
Montenegro	Yes	Yes	Yes	No	No	Yes	NA	Yes
Netherlands	Yes	Yes	Yes	Yes	Yes	Yes	NA	Yes
North Macedonia	Yes	Yes	No	No	No	Yes	No	NA
Norway	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Poland	Yes	Yes	Yes	Yes	Yes	Yes	NA	Yes
Portugal	Yes	Yes	Yes	Yes	Yes	Yes	NA	Yes
Romania	Yes	Yes	Yes	Yes	Yes	Yes	NA	No
Russia	NA	NA	NA	NA	NA	NA	NA	NA
Serbia	NA	NA	NA	NA	Yes	NA	NA	Yes
Slovakia	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Slovenia	Yes	Yes	Yes	Yes	Yes	Yes	NA	Yes
Spain	Yes	Yes	Yes	Yes	Yes	Yes	NA	Yes
Sweden	NA	NA	NA	NA	NA	NA	NA	NA
Switzerland	Yes	Yes	Yes	Yes	No	Yes	NA	No
Türkiye	Yes	Yes	Yes	Yes	NA	NA	NA	Yes
Ukraine	Yes	Yes	Yes	Yes	No	Yes	No	Yes
United Kingdom	NA	NA	NA	NA	NA	NA	NA	NA

NA, not available/not applicable.

The organization of dental practitioners and their regulation in the participating countries can be seen in the existing practice structures and laws, ordinances, and other regulations, and is heterogenous. This can be seen as an indicator of the diversity of national health care systems, as the nation-states differ culturally, economically, and socially.[24] While national dental associations exist in most countries, compulsory membership of dental associations varies greatly. These organizations play an important role as stakeholders and service providers in the (oral) health care system; in many countries, they are the direct point of contact for politicians and thus play an important role through participation in legislation. A coordinated European Union (EU)-wide approach to strengthen these organizations could contribute to professionalization and improved advocacy, with this task already being undertaken by international associations expressing their interests to the EU institutions or their national governments and working with global institutions.[17,25]

The heterogenous data on overtreatment and undersupply in urban and rural areas and changes over the last 10 years suggest that further research is needed to better understand the needs of the population and develop appropriate interventions to improve oral health care. The creation of the European Health Data Space[16] within the 27 countries of the European Union will simplify the comparison of international data in the future and pave the way for the promotion of pan-European measures.[26]

This critical evaluation and forward-looking discussion highlights ways in which a combination of regulatory, educational, and technological measures could achieve a comprehensive improvement in oral health care in Europe. To meet these challenges, dental practitioners must be guided by ethical principles that ensure both the well-being of patients and the reputation of the profession. The Charter of the Liberal Dental Profession[27] provides valuable guidance in this regard by articulating the fundamental values and rights of dental practitioners, such as autonomy, accountability, competence, integrity, and solidarity. These values should not only be taught in training but should also be lived in practice.

Several limitations should be considered when interpreting the results. First, the accuracy and reliability of the data should be mentioned, as the study is based on a survey of national dental organizations, whose information may not always be up to date and complete, may be erroneous, or even represent a desired distortion of the actual situation. Secondly, the study only covers quantitative aspects of dental education and practice, without considering qualitative factors such as clinicians' satisfaction or motivation, as well as direct care policy aspects such as coverage, access, or quality of oral health care. These additional insights could provide a more comprehensive understanding of the care situation. In addition, the study relates to a specific point in time and may not reflect current developments or changes. Continuous collection and updating of data would be desirable to better understand the dynamics of the dental sector. It would also be useful for future research to examine these aspects in more detail and to include the perspective of patients and their care.

Conclusions

Within the limitations of the present study, the different forms of professional practice within the 45 countries of the WHO European Region examined were presented. Independent dental practice is the most common form of practice in the participating countries in Europe (48.65% ± 28.28%). There are statistically significantly more female than male students in dental schools within all participating countries ($P < .01$), and there are statistically significantly more state universities than private universities ($P < .01$). The average ratio of inhabitants per dental practitioners across all countries that participated within the WHO European Region is 1,459.79 ± 800.80. The establishment of dental health care centers is legally regulated in 66.67% of the participating countries. The current modern opportunities for dental practice are diverse within the European nation-states and internationally heterogenous, reflecting the cultural, social, and economic differences of the respective health care systems. The results serve as a basis for further research and the development of measures to improve oral health care. The analysis of dental education shows the dominance of state universities and the increasing number of female dental students, so measures such as promoting sex diversity and making working conditions more flexible may be necessary. The diversity of the dental profession and the legal regulation of dental health care centers raise questions about the quality and accessibility of care. A continuous collection and updating of the data collected in this study from the national dental organizations of the European countries and the inclusion of qualitative aspects, oral health care, and the patient's perspective should take place to ensure a more comprehensive understanding of the situation.

Disclosure

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