ASDJ
AINSHAMS DENTAL JOURNAL

Print ISSN 1110-7642
Online ISSN 2735-5039

AIN SHAMS DENTAL JOURNAL
Official Publication of Ain Shams Dental School
June2025 • Vol. 38

Evaluation of the Nationalization of the Dental Profession in Saudi Arabia: An Opportunity to Support Policy Adjustments

Alla Talal Alsharif[1]

Aim: This study evaluates the nationalization of the dental profession in Saudi Arabia by examining workforce trends, sectoral distribution (Ministry of Health (MOH), other governmental and private), and the impact of Saudization policies between 2021 and 2023.

Material and methods: Data from the MOH Statistical Yearbooks for 2021 and 2023 were analyzed, including dentists' distribution by nationality in MOH dental hospitals, primary health centers (PHCs), other governmental hospitals, and private clinics.

Results: Between 2021 and 2023, dentist employment grew by 14.7%, with Saudization improving in MOH (from 86% to 89.4%) and in the private sector (from 30.3% to 33.3%). Non-Saudi dentists decreased in MOH hospitals, driving Saudization improvements. Saudization in MOH hospitals increased by 9.49%, while PHCs experienced a slight declined (-0.65%). Male dentists' Saudization rose by 3.01%, while female dentists maintained a higher rate, reaching 94% in 2023. Riyadh led Saudization in MOH (97.5%), with significant increases in Najran (+11.52%) and Aseer (+5.60%), though Northern Borders saw a decline (-0.81%). Other governmental hospitals, such as Saudi Airlines Medical Services (+33.3%) and Royal Commission Hospitals (+26.77%), showed substantial gains, while the Ministry of Education declined (-8.03%). Private sector trends were similar, with Aseer (+5.60%) leading gains, while Northern Borders (-0.81%) and Hail (-0.06%) experienced declines.

Conclusion: Significant progress has been made in Saudization, particularly in MOH hospitals and the private sector between 2021 and 2023. However, regional and sectoral disparities persist, emphasizing the need for targeted strategies to ensure balanced and sustainable nationalization efforts in the dental profession.

Keywords: Saudi Arabia; dentists; public and private dental healthcare services; trend analysis; Saudization

1. Department of Preventive Dental Sciences, Taibah University College of Dentistry, Al-Madinah Al-Munawwarah. Saudi Arabia. Corresponding author**:** Alla Alsharif, email: Dr.alla.alsharif@gmail.com

Introduction

Oral health has gained a prominent place on the global health agenda.[1] Considering the significant burden of oral disease[2,3], and the need for workforce adequacy[4,5] are essential for advancing oral health equity and supporting the Sustainable Development Goals (SDGs).[6-8] In Saudi Arabia (SA), a rapid increase in public spending combined with the continuous expansion of industries in both the public and private sectors, has driven a higher demand for a diverse workforce.[9] To address the immediate labor shortage, expatriate workers with varying skills and educational backgrounds were recruited and the number of dental institutes in SA has increased significantly, leading to a rise in dental school graduates. While this growth has led to a favorable reduction in the dentist-to-population ratio, [10-13] excessive reliance on foreign labor raises concerns about potential unemployment among dental graduates and substantial remittance outflows.

Consequently, the nationalization of the dental profession [also known as Saudization] has emerged as a key strategy to address workforce challenges and enhance the sustainability of the healthcare system.[14] The healthcare landscape in SA has witnessed significant development, with a strong government commitment to citizen well-being and to ensuring free access to healthcare for all.[15] Saudi healthcare services are a governmental responsibility, ensuring complete and free accessibility to all residents. The Saudi healthcare system, including dental care, is a combination of public (governmental) and private sectors, with the Ministry of Health (MOH) being the primary government provider and financier in the country.[16] The Saudi dental healthcare system (SDHS) is an integrated network of healthcare services involving various sectors. To oversee healthcare programs nationwide, the MOH collaborates with other government entities, including the Ministry of Interior, the Ministry of National Guard, the Ministry of Defense, the Ministry of Education, and the Ministry of Petroleum and Mineral Resources. However, other government sectors contribute approximately 9% of the available healthcare services, which particularly serve the personnel and families in those sectors.[16,17] The private sector, which contributes approximately 31.1% of healthcare services in the country, has expanded rapidly due to government support, including interest-free loans and infrastructure development.[18,19] Despite this growth, ensuring an adequate and skilled workforce across both sectors remains a critical challenge. Additionally, existing studies on the dental workforce are either outdated or lack comprehensive national-level analysis.[11,12]

To address this gap, the Ministry of Human Resources and Social Development introduced targeted Saudization plans, mandating a 30% nationalization of specific healthcare occupations, including dentistry, in March 2021.[20] By October 2021, Saudization in private dental clinics was increased to a minimum of 60% to address unemployment among Saudi healthcare graduates and promote workforce localization.[20] This study aims to evaluate the nationalization of the dental profession in SA by examining workforce trends, sectoral distribution (MOH, other governmental and private), and the implications of Saudization policies on the dental healthcare system. By focusing on the period from 2021 (prior implementation) to 2023 (following implantation), this evaluation seeks to provide a comprehensive understanding of the progress made and the challenges faced in achieving a sustainable and nationally representative dental workforce.

Materials And Methods

Study design and area

This was a descriptive cross-sectional study examining the sectorial distribution of Saudi and non-Saudi dentists, with the change in the Saudization rate from 2021 to 2023. SA is divided into 13 administrative regions, each with its own governor and distinct characteristics.[21] Riyadh, the capital of SA, is the region's economic and political center. The Makkah and Madinah regions house holy cities with a variety of ethnic populations. While the Eastern Province is known for its oil reserves and industrial centers, the Asir Region is known for its mountains and agriculture. Regions like Qassim, Hail, Al-Jouf, Tabuk, Najran, Jazan, and Al-Bahah are also unique in terms of historical sites, coastal areas, and agricultural activities, contributing to the diverse landscape and culture of SA.

Data sources

Data concerning dentists and dental healthcare facilities were derived from MOH's Statistical Yearbooks for 2021 and 2023. This publicly available information provides details regarding the dentists' demographic, sectorial and regional distribution were also obtained from the MOH's annual Statistical Yearbook.

To calculate the Saudization rate (%) of the dental profession, the following formula was used:

$$= \frac{Number\ of\ Saudi\ Dentists\ in\ the\ year\ concerned}{total\ number\ of\ dentists\ in\ the\ year\ concerned}\ X\ 100$$

To assess the changes in the dynamics of the SDHS, the rate of Saudization in the healthcare services in SA between the period from 2021 (prior implementation) to 2023 (following implantation) was analyzed. The change in Saudization rate was determined using the following formula:

$$= Saudization\ rate\ in\ 2023 - Saudization\ rate\ in\ 2021\ value$$

The "+" sign indicates a positive upward trend in Saudization rate, while the "- "sign signify a negative downward trend.

To assess change in Saudi employability (%) between 2021 and 2023, the following formula was used:

$$= \left(\frac{Saudi\ Employment\ at\ 2023 - Saudi\ Employment\ at\ 2021}{Saudi\ Employment\ at\ 2021}\right)\ X\ 100$$

Results

The over all employment of registered dentists has increased by 14.7%% from 2021 to 2023, with significant growth observed in the employment of dentists within the MOH and private sector. **Table 1** highlights the changing landscape of Saudi and non-Saudi dentists in SA by sector. The percentage of Saudi dentists in MOH increased between 2021 and 2023 from 86.3% to 89.4%, indicating a notable Saudization increase of 3.1%. In contrast, other governmental dental services experienced 0.12% reduction in the number of Saudi Dentists in 2023, representing (~ 84%) of the total number of dentists. The private sector demonstrated steady growth, with the number of Saudi dentists increasing from 4,221 to 5,554. While employment opportunities for Saudi dentists have improved across various sectors, the private sector experienced a 31.6% increase in Saudi dentist employment in 2023.

Table 1: Sectorial distribution of Saudi and non-Saudi dentists in 2021 and 2023, including the change in the Saudization rate by 2023

Sector	Year 2021 (n)			% of Saudi Dentists	Year 2023 (n)			% of Saudi Dentists	Saudization rate in 2023	Saudi employment change (%)
	Total	Saudi	Non-Saudi		Total	Saudi	Non-Saudi			
Ministry of Health	4184	3610	574	86.3	4666	4170	496	89.4	13.43	15.5
Other governmental	1998	1679	319	84	2238	1878	360	83.9	10.60	11.9
Private	13931	4221	9710	30.3	16676	5554	11122	33.3	24.00	31.6
Total	20113	9510	10603	47.28	23580	11602	11978	49.2	18.03	22

Table 2 presents the distribution of MOH Saudi and non-Saud dentists by healthcare facilities, gender, and administrative region. Saudi dentists constitute the majority of MOH dentists with an overall Saudization rate improved by 3.1%, increasing from 86.3% in 2021 to 89.4% in 2023. The number of non-Saudi dentists varied across healthcare facilities, demonstrating a general downward trend. Hospital had significantly higher number of non-Saudi dentists (464) compared to only 32 in primary healthcare centers (PHCs). In hospitals, the Saudization rate increased by 9.49% in 2023. In contrast, the Saudization rate in PHCs experienced a slight decline of 0.65%, dropping from 99.5% in 2021 to 98,8% in 2023. The number of male dentists was higher than female dentists, with the Saudization rate among males increasing by 3.01% to 86.4% in 2023, while female dentists maintained a higher Saudization rate, improving by 2.56% to reach 94%. The regions of Najran (+11.52%), Northern Borders (+5.59%), and Aseer (+5.36%) showed the most significant increases in Saudization rates, while Al-Jouf (-10.02%) and Tabouk (-6.17%) experienced declines. Riyadh retained the highest Saudization rate at 97.5% in 2023, reflecting an improvement of 2.11% from 2021.

The distribution of Saudi and non-Saudi dentists in other governmental sectors from 2021 to 2023 showed an overall stable Saudization rate, declining slightly by 0.12% (Table 3). Female dentists saw a slight increase in Saudization (+0.72%), while males experienced a slight decline (-0.82%). By 2023, most sectors showed positive trends, with significant Saudization improvements in Saudi Airlines Medical Services (+33.3%), where Saudi dentists accounted for 66.7%, and Royal Commission Hospitals (+26.77%), reaching 67.3% Saudi dentists, However, the Ministry of Education experienced a notable decline (-8.03%), reducing its Saudization rate to 73%.

Table 2: Gender and regional distribution of Saudi and non-Saudi dentists in the Ministry of Health in 2021 and 2023, with the change in the Saudization rate by 2023

Variables		Distribution of Dentists in the Ministry of Health								Saudization rate in 2023
		Year 2021 (n)			% of Saudi Dentists	Year 2023 (n)			% of Saudi Dentists	
		Total	Saudi	Non-Saudi		Total	Saudi	Non-Saudi		
Total		4184	3610	574	86.3	4666	4170	496	89.4	3.09
Sector	Hospitals	1661	1100	561	66.2	1911	1447	464	75.7	9.49
	Primary Healthcare	2523	2510	13	99.5	2755	2723	32	98.8	-0.65
Gender	Males	2697	2250	447	83.4	2860	2472	388	86.4	3.01
	Females	1487	1360	127	91.5	1806	1698	108	94.0	2.56
Region	Riyadh	1194	1139	55	95.4	1443	1407	36	97.5	2.11
	Makkah	786	703	83	89.4	830	761	69	91.7	2.25
	Eastern	483	444	39	91.9	643	613	30	95.3	3.41
	Madinah	206	175	31	85.0	220	195	25	88.6	3.68
	Aseer	321	272	49	84.7	424	382	42	90.1	5.36
	Jazan	141	124	17	87.9	155	140	15	90.3	2.38
	Qaseem	284	183	101	64.4	300	197	103	65.7	1.23
	Tabouk	160	142	18	88.8	132	109	23	82.6	-6.17
	Hail	130	98	32	75.4	125	96	29	76.8	1.42
	Al-Jouf	153	98	55	64.1	124	67	57	54.0	-10.02
	Najran	134	105	29	78.4	79	71	8	89.9	11.52
	Northern borders	109	71	38	65.1	123	87	36	70.7	5.59
	Al-Bahah	83	56	27	67.5	68	45	23	66.2	-1.29

Table 4 provides insights into the distribution of dentists practicing in the private sector within various administrative regions of SA, in addition to the percentage change between 2021 and 2023. In 2021, there were 13,931 dentists working in the private sector across all health regions, and this number increased to 16,676 in 2023, with an overall increase in the Saudization rate by 3.01%, rising from 30.3% to 33.3%. Among male dentists, the Saudization rate improved by 3.78%, increasing from 27.0% in 2021 to 30.8% in 2023. Similar trend was observed in the Saudization of female dentists, with a 2.13% increase from 34.6% in 2021 to 36.7% in 2023. In addition, the regions with the

highest Saudization rate in 2023 were Jazan (37.4%), Riyadh (37.3%), and Makkah (34.9%). The most significant increase occurred in Aseer, where the Saudization rate rose by 5.60%, from 24.4% in 2021 to 30.0% in 2023. Other regions, such as Madinah (3.47%) and Najran (2.91%), showed moderate increases, while Northern Borders (-0.81%) and Hail (-0.06%) experienced slight declines in Saudization rates.

Table 3: Gender and sectorial distribution of Saudi and non-Saudi dentists in the other governmental sector in 2021 and 2023, with the change in the Saudization rate by 2023

Variables		Distribution of Dentists in Other Governmental Sectors								Saudization rate in 2023
		Year 2021 (n)			% of Saudi Dentists	Year 2023 (n)			% of Saudi Dentists	
		Total	Saudi	Non-Saudi		Total	Saudi	Non-Saudi		
Total		1998	1679	319	84.0	2238	1878	360	83.9	-0.12
Gender	Males	1106	886	220	80.1	1236	980	256	79.3	-0.82
	Females	892	793	99	88.9	1002	898	104	89.6	0.72
Sector	Armed Forces Medical Services	824	709	115	86.0	887	783	104	88.3	2.23
	National Guard Medical Services	313	297	16	94.9	288	280	8	97.2	2.33
	Ministry of Interior Medical Services	96	66	30	68.8	163	136	27	83.4	14.69
	King Faisal Specialist Hospital	41	37	4	90.2	79	74	5	93.7	3.43
	Royal Commission Hospitals	37	15	22	40.5	52	35	17	67.3	26.77
	ARAMCO Hospitals	46	36	10	78.3	48	41	7	85.4	7.16
	Ministry of Sports	2	2	0	100.0	2	2	0	100	0
	Ministry of Human Resources and Social Development	0	0	0	0.0	1	1	0	100	100
	Saudi Red Crescent Authority	0	0	0	0.0	0	0	0	0	0
	Saline Water Conversion Corporation	6	5	1	83.3	7	7	0	100.0	16.67
	Saudi Airlines Medical Services	3	1	2	33.3	9	6	3	66.7	33.33
	Ministry of Education	630	511	119	81.1	702	513	189	73.1	-8.03

Table 4: Gender and regional distribution of Saudi and non-Saudi dentists in the private sector in 2021 and 2023, with the change in the Saudization rate by 2023

Variables		Distribution of Dentists in Private Sectors								Saudization rate in 2023
		Year 2021 (n)			% of Saudi Dentists	Year 2023 (n)			% of Saudi Dentists	
		Total	Saudi	Non-Saudi		Total	Saudi	Non-Saudi		
Total		13931	4221	9710	30.3	16676	5554	11122	33.3	3.01
Gender	**Males**	7897	2134	5763	27.0	9611	2960	6651	30.8	3.78
	Females	6034	2087	3947	34.6	7065	2594	4471	36.7	2.13
Region	**Riyadh**	4279	1432	2847	33.5	5136	1915	3221	37.3	3.82
	Makkah	3602	1129	2473	31.3	4118	1438	2680	34.9	3.58
	Eastern	2187	699	1488	32.0	2604	875	1729	33.6	1.64
	Madinah	914	240	674	26.3	1046	311	735	29.7	3.47
	Aseer	816	199	617	24.4	1144	343	801	30.0	5.60
	Jazan	378	139	239	36.8	409	153	256	37.4	0.64
	Qaseem	595	155	440	26.1	730	207	523	28.4	2.31
	Tabouk	294	53	241	18.0	376	72	304	19.1	1.12
	Hail	263	65	198	24.7	357	88	269	24.6	-0.06
	Al-Jouf	168	44	124	26.2	212	56	156	26.4	0.22
	Najran	183	31	152	16.9	272	54	218	19.9	2.91
	Northern borders	145	18	127	12.4	112	13	99	11.6	-0.81
	Al-Bahah	107	17	90	15.9	160	29	131	18.1	2.24

Discussion

This study conducted a nationwide analysis of dentist distribution across SA, focusing on Saudization policies' impact between 2021 (pre-implementation) and 2023 (post-implementation). The findings highlight significant progress in Saudization across various sectors, particularly in the private sector, which contributed the most to workforce growth. These results align with the previous literature[17,22] and the Saudi Arabia's Vision 2030 objectives to reduce reliance on foreign professionals and reinforce local workforce participation in healthcare.

As in other countries, gender distribution among the dental workforce in SA is an imperative factor. Regardless Saudi

healthcare sector, the number of male dentists exceeds that of female dentists. This lower proportion of working female dentists than working male dentists is also observed in other countries.[23] Evidence suggests that understanding the feminization of the dental workforce requires also understanding how gender interacts with other social identities, such as race and ethnicity, to influence the opportunities and barriers female dentists face in their careers.[24] Across sectors, female dentists have shown a consistently higher Saudization rate compared to their male counterparts. Moreover, the proportion of female dentists in the MOH and other governmental healthcare facilities showing an increasing trend compared to that in 2016 (38.9%) and 2020 (45.14%).[17,22] These disparities might be due to policies promoting Saudi female participation in the workforce or in many setting female patients might prefer female dentists due to cultural norms.[24,25]

The MOH reported an increase in Saudization, likely guided by targeted recruitment and retention strategies designed to attract Saudi dentists, particularly residents, to PHCs. These efforts have contributed to reducing unemployment among graduate dentists. This finding is consistent with a previous study that reports combined data from 2015 and 2020.[26] Notably, following the 2019 First Future Workforce Conference in SA, solutions for unemployment include updating the National Employment Platform, incentivizing remote work for graduates, supporting employers that hire Saudi dentists, establishing training programs, and conducting annual surveys on specialty needs.[27,28] The increase in Saudi residency and scholarship programs is also believed to play a significant role in the presence of Saudi dentists in specialist positions compared to previous years.[29]

Despite the high Saudization rate in PHCs, there has been a slight decline in the number of Saudi dentists between 2021 and 2023. This decline may be related to a reduction in the number of PHC facilities across SA, a trend that is inconsistent with the 21st century SDGs of the World Health Organization and the United Nations International Children's Emergency Fund for primary healthcare (Goal 3; Target 3.8).[1-6] Additionally, this reduction may reflect a growing demand for specialized care, especially after the COVID-19 pandemic, which significantly impacted the distribution and accessibility of dental healthcare. Conversely, a higher proportion of non-Saudi was observed working in hospitals compared to PHCs, since many of them serve as consultants, reflecting specialized expertise required in hospital settings. Similar trends have been observed in other healthcare fields, where larger, more specialized facilities tend to attract and retain consultants at higher rates.[17, 30]

Despite the increasing number of dentists, substantial disparities in distribution, growth, and composition persist, with distinct regional inequality. Retaining a qualified health workforce in secondary regions and rural and underserved areas remain challenging for health systems worldwide, including oral health systems, regardless of region and country income status.[31,32] This inequitable distribution can be influenced by various individual, organizational, political, economic, and social factors.[33] The free-market business model of oral healthcare, which focuses on demand and supply, rather than workforce regulation and fair distribution based on population needs and universal health coverage principles, contributes to this issue.[9,33] The regions of Najran, Northern Borders, and Aseer showed the most significant increases in MOH Saudization rates, while Al-Jouf and Tabouk experienced declines. This increasing trend can be linked to targeted government initiatives,

investments in healthcare infrastructure, especially in underserved and rural regions, and preferences for local professionals. While the decline in Saudization rates in certain regions can be attributed to the outmigration of Saudi dentists for better opportunities, challenges in retaining local professionals due to limited resources, and reliance on non-Saudi experts for specialized roles.[27] On the other hand, Riyadh's (the capital city) high Saudization rate is driven by its advanced healthcare facilities, superior career opportunities, prominent educational institutions, and government policies prioritizing it as a model for national employment strategies.

The rising Saudization in other government hospitals may be attributed to the growing number of employed dental consultants. The Saudi workforce stands to benefit as the Ministry of Human Resources, the Ministry of Social Development, and the MOH have begun implementing a 35% nationalization of dental professions in the private sector.[26] These government initiatives have led to a steady increase in the number of dentists in the private sector, an increased proportion of Saudi dentists, and a higher employment rate in nationwide, not just in the major cities. Additionally, many of these hospitals are specialized and well-equipped, making them attractive to skilled professionals and enhancing their capacity to deliver advanced dental care. Also, the increasing presence of Saudi dentists in Saudi Airlines Medical Services could be linked to its operation under a well-recognized private sector, which offers incentives that encourage Saudi dentists to join its workforce.

The private sector across all administrative regions experienced an increase in the number of dentists, especially consultants, indicating a gradual shift toward privatization of the dental profession. This growth reflects changes in private sector regulations and the establishment of many reputable dental centers, especially in major regions. With the expansion of insurance coverage and a growing number of insured individuals, the private sector is attracting a higher percentage of prosthodontics and dental implantology consultants.[29] Additionally, Saudi citizens have increasingly embraced the private healthcare sector due to its advanced services, even though they are eligible for free healthcare services provided by the MOH and other providers in the governmental health sector. While this trend has further diversified and enriched the healthcare landscape in SA, it raises concerns about a potential recruitment and retention crisis in the government sector's dental workforce in the future.

Despite providing a comprehensive analysis of Saudization trends in the dental workforce, this study has several limitations. First, the study relies on MOH Statistical Yearbooks, which may not capture real-time workforce changes, employment transitions, or the full scope of private sector employment dynamics. Second, while regional disparities were analyzed, factors influencing workforce distribution, such as living cost, job satisfaction, and working conditions, were not explored in depth. Finally, the findings focus on quantitative workforce trends, with limited qualitative insights from dentists regarding challenges, motivations, and barriers to employment. Future research should assess the long-term impact of Saudization policies on dental workforce retention, career progression, or patient care quality.

Conclusion

The study highlights significant progress in the Saudization of the dental workforce across various sectors, with notable improvements in MOH hospitals and the private sector between 2021 and 2023. However, regional and sectoral disparities persist, emphasizing the need for targeted

strategies to ensure balanced and sustainable nationalization efforts in the dental profession. To ensure sustainable Saudization of the dental workforce, key strategies include enhancing retention in the government sector through financial incentives, career growth opportunities, and specialized training, particularly in PHCs and underserved regions. Addressing regional disparities requires targeted policies and infrastructure investments to attract Saudi dentists to low-employment areas. Strengthening the private sector's role through university collaborations and regulated insurance policies will support workforce development without overburdening private healthcare. Lastly, promoting workforce equity by supporting gender advancement, work-life balance policies, and a national dental workforce database will ensure long-term sustainability and policy-driven improvements.

Funding

The author has no relevant financial and non-financial interests to disclose.

Ethics Statement

The researcher used openly accessible, nonidentifiable data and information. Therefore, ethics approval was not required.

References

1. World Health Organization. Landmark Global Strategy on Oral Health Adopted at World Health Assembly 75. Geneva: World Health Organization; 2022. Available online: https://www.who.int/newsroom/feature-stories/detail/landmark-global-strategy-on-oral-health-adopted-at-world-health-assembly-75 (cited on 7 August 2024).
2. Peres MA, Macpherson LMD, Weyant RJ, et al. Oral Diseases: A Global Public Health Challenge. Lancet. 2019; 394:249–260.
3. Jevdjevic M, Trescher AL, Rovers M, Listl S. The Caries-Related Cost and Effects of a Tax on Sugar-Sweetened Beverages. Public Health. 2019; 169:125–132.
4. World Health Organization. 75th World Health Assembly, Resolution WHA75/10. Geneva: World Health Organization; 2022. Updated May 27, 2022. Available online: https://apps.who.int/gb/Journal/e/WHA75/JRN-A75-3_en.html (cited on 7 August 2024).
5. United Nations Department of Economic and Social Affairs, Population Division. "Political Declaration of the High-level Meeting on Universal Health Coverage: Universal Health Coverage: Moving Together to Build a Healthier World." United Nations; 2019. Updated December 7, 2021. Available online: https://www.un.org/pga/73/wpcontent/uploads/sites/53/2019/07/FINAL-draft-UHC-Political-Declaration.pdf (cited on 7 August 2024).
6. World Health Organization. Targets of Sustainable Development Goal 3. Geneva: World Health Organization; 2023. Available online: https://www.who.int/europe/about-us/our-work/sustainable-development-goals/targets-of-sustainable-development-goal-3 (cited on 10 August 2024).
7. United Nations Department of Economic and Social Affairs, Population Division. Transforming Our World: The 2030 Agenda for Sustainable Development. United Nations; 2015. Available online: https://sdgs.un.org/2030agenda (cited on 10 August 2024).
8. Gupta A, Feldman S, Perkins RB, et al. Predictors of Dental Care Use, Unmet Dental Care Need, and Barriers to Unmet Need Among Women: Results from NHANES, 2011 to 2016. J Public Health Dent. 2019; 79:324–333.
9. Albassam BA. Economic diversification in Saudi Arabia: Myth or reality? Resources Policy. 2015; 44:112-117.
10. Shubayr M, Kruger E, Tennant M. Assessment of Dental Healthcare Services and Workforce in the Jazan Region, Saudi Arabia. Saudi J Oral Dent Res. 2021; 6:81–87.
11. Alkhamis A, Alsalem MM, Alsaad AH, Alsalleeh FM. Workforce Analysis of Dentists in Private Clinics in Al-Ahsa Governorate, Saudi Arabia. Saudi J Oral Dent Res. 2020; 5:413–416.
12. AlBaker M, Al-Ruthia YSH, AlShehri M, Alshuwairikh S. The Characteristics and Distribution of Dentist Workforce in Saudi Arabia: A Descriptive Cross-Sectional Study. Saudi Pharm J. 2017; 25:1208–1216.
13. Farhan B, Brevetti M, Laditan D. Unemployment in Saudi Arabia: The ethical and economic impact of foreign workers on the Middle East market. Middle East Journal of Business. 2016; 11:21–38.

14. Shalhoub SY, Badr AA. Professional Dental Education in the Kingdom of Saudi Arabia—An Overview. Odontostomatol Trop. 1987; 10:205–212.
15. Mani ZA, Goniewicz K. Transforming Healthcare in Saudi Arabia: A Comprehensive Evaluation of Vision 2030's Impact. Sustainability. 2024; 16:3277.
16. Almalki M, Fitzgerald G, Clark M. Health Care System in Saudi Arabia: An Overview. East Mediterr Health J. 2011; 17:784–793.
17. Walston S, Al-Harbi Y, Al-Omar B. The Changing Face of Healthcare in Saudi Arabia. Ann Saudi Med. 2008; 28:243–250.
18. National Transformation Program. Saudi Arabia's Vision 2030. National Transformation Program 2020. Available online: https://www.vision2030.gov.sa/en/vision-2030/vrp/health-sector-transformation-program/ (cited on 11 August 2024).
19. Al-Hanawi MK, Qattan AM. An Analysis of Public-Private Partnerships and Sustainable Health Care Provision in the Kingdom of Saudi Arabia. Health Serv Insights. 2019; 12:1178632919859008.
20. The Ministry of Human Resources and Social Development. Ministry of Human Resources and Social Development Launches Labor Reforms. MHRSD. 2021. Available at: https://www.hrsd.gov.sa/en/media-center/news/770957
21. General Authority of Statistics. General Information About the Kingdom of Saudi Arabia. Available online: https://portal.saudicensus.sa/portal (cited on 4 Sep 2024).
22. Almalki O, Fathelrahman A, Alfayez O, Bawazeer G, Current situation and barriers to women's leadership in health care education in Saudi Arabia: A cross-sectional study, Saudi Pharm J. 2024;32:102000, https://doi.org/10.1016/j.jsps.2024.102000.
23. Tiwari T, Randall CL, Cohen L, Holtzmann J, Webster-Cyriaque J, Ajiboye S, Schou L, Wandera M, Ikeda K, Fidela de Lima Navarro M, Feres M, Abdellatif H, Al-Madi E, Tubert-Jeannin S, Fox CH, Ioannidou E, D'Souza RN. Gender Inequalities in the Dental Workforce: Global Perspectives. Advances in dental research. 2019; 30(3):60–68. https://doi.org/10.1177/0022034519877398
24. Alsaeed S, Alghurairi N, Almutairi L, Alossimi A, Bin Fadhl A, Abahussain S. Factors That Affect Saudi Population Preferences Toward Their Dentist. Patient Prefer Adherence. 2021; 15:2693-2701. Published 2021 Dec 2. doi:10.2147/PPA.S333994
25. Alqahtani AS, Alqhtani NR, Gufran K, et al. Analysis of Trends in Demographic Distribution of Dental Workforce in the Kingdom of Saudi Arabia. J Healthc Eng. 2022; 2022:5321628.
26. The Ministry of Human Resources and Social Development (MHRSD). The Ministry of Human Resources and Social Development in Partnership with the Ministry of Health Announces the Beginning of Implementation of the Decision to Nationalize the Dental Professions. MHRSD; 2024. Available online: https://www.hrsd.gov.sa/en/media-center/news/100320241 (cited on 10 July 2024).
27. Alqahtani AS, Alqhtani NR, Gufran K, et al. Analysis of Trends in Demographic Distribution of Dental Workforce in the Kingdom of Saudi Arabia. J Healthc Eng. 2022; 2022:5321628.
28. Cometto G, Buchan J, Dussault G. Developing the Health Workforce for Universal Health Coverage. Bull World Health Organ. 2020; 98:109–116.
29. Alqahtani HM, Alqahtani LZ, Almutairi NH. Saudi dental postgraduate education (2013–2023): demographic shifts and potential employment challenges. BMC Med Educ. 2025;25: 45 https://doi.org/10.1186/s12909-025-06663-4
30. Al-Hanawi MK, Khan SA, Al-Borie HM. Healthcare human resource development in Saudi Arabia: emerging challenges and opportunities—a critical review. Public Health Rev. 2019;40: 1 https://doi.org/10.1186/s40985-019-0112-4
31. Watt RG, Daly B, Allison P, et al. Ending the Neglect of Global Oral Health: Time for Radical Action. Lancet. 2019; 394:261–272.
32. Almulhim AI, Cobbinah P. Can Rapid Urbanization be Sustainable? The Case of Saudi Arabian Cities. Habitat Int. 2023; 139:102884.
33. Gallagher JE, Mattos Savage GC, Crummey SC, Sabbah W, Makino Y, et al. Health workforce for oral health inequity: Opportunity for action. PLOS ONE. 2024; 19(6): e0292549. https://doi.org/10.1371/journal.pone.0292549