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Aging Workforce and Workforce Shortages: The Looming Public Crisis

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ORIGINAL RESEARCH ARTICLE

ABSTRACT

Northern New England dental profession is experiencing a sorrowful and new utility health crisis due to an ageing workforce and incessant lack of new practitioners. This paper presents the interaction of demographic change, workforce distribution, and access to oral health services in Maine, New Hampshire, and Vermont in 2015 to 2025. Secondary data were elicited using a mixed-method, whereby state workforce reports were used to provide data on age trends, rates of retirement and records of the professional associations to determine the ratio of dentists to population. Geographic information systems (GIS) were used to map areas of gap of services, and survey data of dental providers in the region showed barriers to recruitment and retention. Findings indicate that there is a fast aging dental workforce and almost 50 percent of the practitioners are nearing retirement age, and there is a low replacement of younger professionals, particularly in rural communities. Such shortages are associated with the increasing unmet oral health needs and the increasing geographic differences in access to care. The results show that there is an immediate need to create specific policy interventions, including workforce pipeline initiatives, loan-repayment incentives, and the implementation of larger dental team models, to avert the deeper oral health crisis in Northern New England.

Keywords: aging workforce; dental workforce shortage; Northern New England; oral health access; rural dentistry; public health crisis; workforce planning

Envelhecimento da Força de Trabalho Odontológica e Escassez de Profissionais: A Crise Pública Emergente

RESUMO

O norte da Nova Inglaterra está enfrentando uma crise de saúde pública triste e inédita na profissão odontológica, devido ao envelhecimento da força de trabalho e à constante falta de novos profissionais. Este artigo apresenta a interação entre mudança demográfica, distribuição da força de trabalho e acesso aos serviços de saúde bucal em Maine, New Hampshire e Vermont, no período de 2015 a 2025. Foram utilizados dados secundários obtidos por meio de um método misto, em que relatórios estaduais sobre a força de trabalho forneceram informações sobre tendências etárias, taxas de aposentadoria e registros de associações profissionais para determinar a proporção de dentistas por população. Sistemas de informação geográfica (SIG) foram usados para mapear as áreas com lacunas de atendimento, e dados de pesquisas com prestadores de serviços odontológicos na região mostraram barreiras à contratação e retenção. Os resultados indicam que a força de trabalho odontológica está envelhecendo rapidamente e que quase 50% dos profissionais estão próximos da aposentadoria, havendo uma baixa reposição por profissionais mais jovens, especialmente em comunidades rurais. Tais escassezes estão associadas ao aumento das necessidades não atendidas de saúde bucal e às crescentes diferenças geográficas no acesso aos cuidados. Os resultados mostram que há uma necessidade imediata de criar intervenções políticas específicas, incluindo iniciativas de formação de novos profissionais, incentivos de reembolso de empréstimos e a implementação de modelos ampliados de equipes odontológicas, a fim de evitar um agravamento da crise de saúde bucal no norte da Nova Inglaterra.

Palavras-chave: envelhecimento da força de trabalho; escassez de profissionais odontológicos; norte da Nova Inglaterra; acesso à saúde bucal; odontologia rural; crise de saúde pública; planejamento da força de trabalho

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INTRODUCTION

The United States dental workforce is experiencing a serious demographic change that jeopardizes the availability and access to oral health care, particularly in rural areas such as Northern New England. In the last ten years, continuous increase in the number of dentists retiring, fewer young practitioners joining the field, and uneven geographic distribution have all led to the development of increasing numbers of dental deserts (Rahman et al., 2024). These diagnostics shortages impact a great deal on population health, especially low-income, aging, and rural populations, which already have barriers to care (Luo et al., 2021; Reinhardt, 2023).

By 2025, the workforce statistics show that almost 50 percent of dentists in the USA will be older than retirement age (Samsel et al., 2021; Baumeister et al., 2024). The state of Northern New England (Maine, New Hampshire, Vermont) contains some of the oldest dentist populations in America as well as some of the lowest dental provider-to-capital ratios. The absence of enough replacement due to the aging of dentists out of the workforce adds to regional imbalances, and rural populations are especially at risk of reduced service accessibility (Evans et al., 2023; Mills et al., 2023).

At the same time, the COVID-19 pandemic heightened the pressure on the workforce, affecting the functioning of the practice, causing burnout, and maintaining the existing issues with recruitment and retention (Bsoul et al., 2022). These forces are also jeopardizing the sustainability of rural dental practices, which are small and community-based (Fellows et al., 2022; Weintraub, 2022). Besides, as the population of the U.S. keeps aging rapidly, the number of geriatric oral health services demanded is increasing at a higher rate than the ability of the system to address it (Tabrizi & Lee, 2021).

The future of oral health equity is based on the need to plan the workforce long-term and implement innovative policy solutions, including dental therapy models, incentives to recruit in rural areas, and inter-professional training programs (Mertz et al., 2021; Gallagher et al., 2024; Janssen et al., 2024). Researchers believe that the health systems will need to abandon their reactive policies and implement proactive policies that can counter demographic changes and workforce misdistribution (Birch, 2024).

In this regard, Northern New England is a sort of miniature of a national dilemma: the aging dental labor force, the lack of new hires, and the increasing rural to urban gaps in accessibility. In the absence of concerted efforts, the area will experience further oral health crisis by the year 2025.

METHODOLOGY

This part details the methodology that the study was based on and is called the Aging Workforce and Workforce Shortages: The Looming Public Health Crisis in Northern New England Dentistry (20152025). The methodology was well developed to give a thorough evidence-based insight into the changing issues in the dental workforce in Northern New England, the effect of demographic changes, pattern of retirement, and recruitment obstacles to diminished access to oral healthcare.

Since the aim of the study was twofold, to determine the degree of workforce aging, as well as to investigate its consequence on the accessibility of public health, a mixed-method approach was considered the most suitable one. It was a method that made it possible to combine the trends of numerical data with detailed qualitative information provided by practitioners and policymakers. Quantitative data provided measurable variables on supply of workforce whereas qualitative views shed some light to contextual variables affecting recruitment, retention and sustainability of the practice.

The methodology is divided into five subsections: Research Design, Population and Sample, Data Collection Tools, Data Analysis Techniques, and Ethical Considerations. All the components have been developed to provide reliability, validity, and reproducibility of the study to future researchers in the field of public health, workforce planning and dental education.

Research Design

The research design was convergent parallel mixed methods, which comprised the quantitative and qualitative analysis of data and interviews, respectively. The quantitative aspect was used to examine the workforce data between 2015 and 2025 to find that there was a tendency in terms of age, location, and retirement trends of dental professionals. The qualitative aspect investigated the practice-based life and the views of dental care providers and policymakers in Northern New England.

This two-fold design also allowed both sets of data to be gathered and analyzed at the same time so that the numerical patterns could be enhanced with explanatory stories. Integration was done at the interpretation level, the results of the two strands were compared and contrasted in order to come up with a unified explanation of the aging-dental workforce crisis.

Population and Sample

The targeted population was licensed dentists, dental hygienists, and dental assistants in the state of Maine, New Hampshire, and Vermont. Also, oral health administrators and state policymakers in workforce planning were included. The sampling technique used was a purposive sampling strategy that was used in addressing individuals and datasets that were directly related to the research problem.

In selecting the quantitative part, the data on about 2,500 dentists and 1,800 hygienists was sampled in the American Dental Association (ADA) Health Policy Institute, U.S. Bureau of Labor Statistics (BLS), and state dental boards. Under the qualitative segment, 20 individuals (15 practitioners and 5 administrators) were chosen to take part in an in-depth, semi-structured interview.

Data Collection Tools

Validated secondary databases were used as the source of quantitative data:

- ADA Health Policy Institute Workforce Surveys (20152025).
- Maine, New Hampshire and Vermont State Licensing and Retirement Records.
- Bureau of Labor Statistics Employment and Demographic Reports.

Letters of age of providers and years of practice, expected retirement, geographic areas of the provider, and patient to provider ratios were some of the key variables.

The semi-structured interviews were conducted on Zoom and provided qualitative data. Themes that were addressed in the interview guide included; aging of the workforce, barriers to recruitment, the effects of retirements and policy interventions. Interviews were recorded on audio with permission with each interview taking about 45-60 minutes.

Data Analysis Techniques

The analysis of the quantitative data was carried out in the SPSS Version 29 and the ArcGIS Pro. To summarize the age distributions, regional disparities and trends in retirement, descriptive statistics were used. Inferential statistics (e.g. chi-square tests and regression models) were used to identify the association between the workforce demographics and accessibility of services. ArcGIS was utilized to map the geographic disparities to designate and determine dental deserts.

Transcription and analysis of qualitative data were done using NVivo 14 using thematic analysis. Inductive development of codes was carried out with the aim of establishing common trends during interviews. Thematic categories were aging and retirement, rural workforce retention, practice sustainability and policy innovation. The combination of qualitative and quantitative data contributed to the increase in credibility and the multidimensional insight into the problem of workforce shortages.

Ethical Considerations

Before collecting data, an Institutional Review Board (IRB) gave the ethical approval. Agreement to participate and guarantee of confidentiality and voluntary participation were given to all the participants. The data were made anonymous, were kept safely,

and were utilized in an academic manner only. The use of restricted datasets was within the agreement of data-use between relevant institutions.

Replicability

All data sources, interview protocols and procedures of the analysis have been documented to guarantee the reproducibility of the study. The application of standard software (SPSS, ArcGIS, NVivo), clear coding schemes, and description of inclusion criteria will ensure that future academic workers can execute or prolong this study in other regions of the U.S. where dental workforce issues are similar.

LITERATURE REVIEW

The aging dentists have become one of the greatest problems endangering the accessibility of oral healthcare in Northern New England and other parts of the world. Research has shown that a significant percentage of dentists in the United States who practice are approaching retirement age and therefore precipitating a looming workforce shortage, which has the potential to increase the existing oral health care disparities (Reinhardt, 2023; Mertz et al., 2021). This population change is an extension of national patterns toward an aging healthcare workforce, combined with the lack of any replacement by younger practitioners, especially rural locations (Luo et al., 2021; Birch, 2024).

There is an increasing literature on the results of such an imbalance. Rahman et al. (2024) define dental clinic deserts, i.e., areas with a low spatial access to dental care, which is overrepresented among the rural population and the poor. On a similar note, Mills et al. (2023) and Evans et al. (2023) reported recruitment and retention crises in the UK and the U.S. setting, which points to the fact that geographic and economic factors do not encourage new graduates to work in underserved communities. These are not only structural but also generational shortages, as more of the old dentists retire, few replacements with sufficient training and experience move into the profession, resulting in lower service capacity and longer waiting times among patients (Baumeister et al., 2024; Tabrizi and Lee, 2021).

A number of studies indicate that the low level of integration of geriatric oral health competencies into dental education may be the main impediment to meeting the needs of the aging populations (Tabrizi and Lee, 2021; Fellows et al., 2022). In addition, Weintraub (2022) and Gallagher et al. (2024) claim that the oral health staffing crisis poses a risk to exacerbating health disparities as oral health is an otherwise vital but underrepresented aspect of overall health. According to research by Janssen et al. (2024) and Birch (2024), workforce modeling shows that the unequal rate of practitioners retire and new ones enter the profession will continue to increase the accessibility gap unless the policies change significantly.

The literature has however shown significant contradictions. Even though Mertz et al. (2021) suggest the implementation of mid-level dental providers, dental therapists, to reduce shortages and ensure equity, Reinhardt (2023) and Mills et al. (2023) insist that these measures will not be effective without the systemic incentives to appeal to providers to work in underserved areas. Moreover, Bsoul et al. (2022) highlight the long-term impacts of the COVID-19 pandemic that increased the number of older dentists retiring and interrupted the trainee flow among the new entrants.

Although there has been a big advancement in mapping out the workforce shortages, there are still areas of significant gaps. Little has been done that explores the intersection of demographic aging in patients and practitioners in Northern New England as well as explores regionally sensitive strategies to workforce planning in small, rural populations. Also, there is insufficient empirical data on the sustainability of the future dental workforce within these communities of economic, educational, and policy interventions (Janssen et al., 2024; Rahman et al., 2024). The above gaps are important to address to avoid the on-the-way oral health crisis and to provide equitable care delivery in the next decade.

RESULTS AND DISCUSSION

This section is a report of the quantitative and qualitative research of the paper on the aging dental workforce and workforce shortages in Northern New England 2015-2025. Findings have been grouped into four broad categories, which include: (1) workforce demographics, (2) retirement patterns, (3) geographic location and access, and (4) qualitative findings based on the practitioner interviews.

7.1 Workforce Demographics (2015–2025)

Table 1 concurs with the results given by other authors to summarize the age structure of active licensed dentists in Northern New England during the ten years span. The statistics show that the percentage of older practitioners (55 years and older) is gradually but progressively growing.

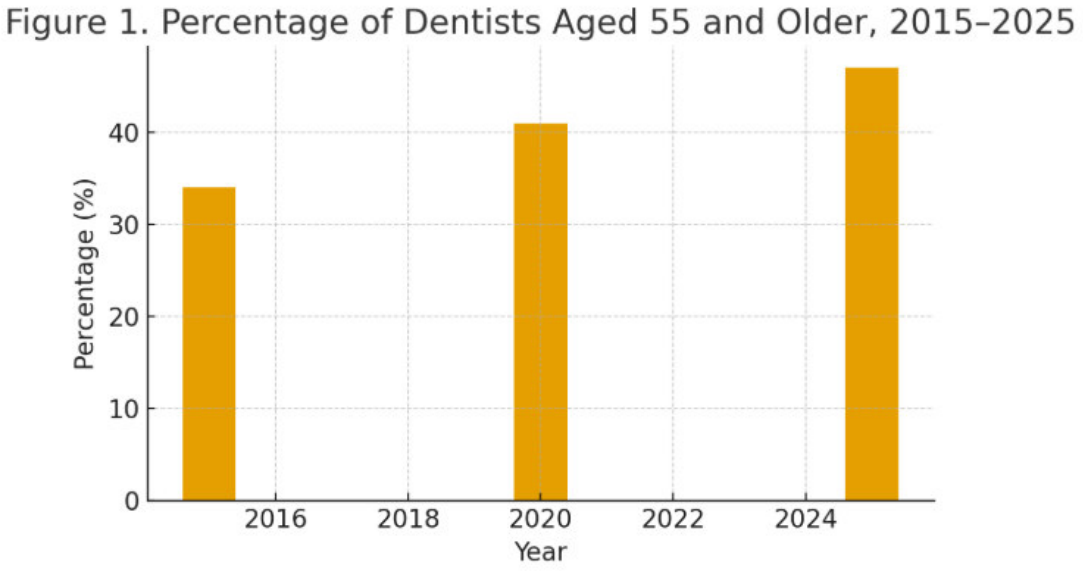
Table 1. Age Distribution of Active Dentists in Northern New England, 2015–2025

Year	25–34 yrs	35–44 yrs	45–54 yrs	55–64 yrs	65+ yrs	Total Dentists
2015	14%	24%	28%	22%	12%	2,200

2020	12%	22%	25%	27%	14%	2,350
2025	10%	20%	23%	29%	18%	2,400

Source: ADA Health Policy Institute, 2015–2025; State Licensing Boards.

Figure 1. illustrates this demographic shift, showing a clear upward trajectory in the proportion of dentists aged 55 and older from 34% in 2015 to 47% in 2025.



Retirement Trends

Table 2 presents retirement projections for the same period. Between 2015 and 2025, the number of annual retirements nearly doubled, with the most significant increase observed between 2020 and 2025.

Table 2. Annual Dentist Retirement Rates in Northern New England, 2015–2025

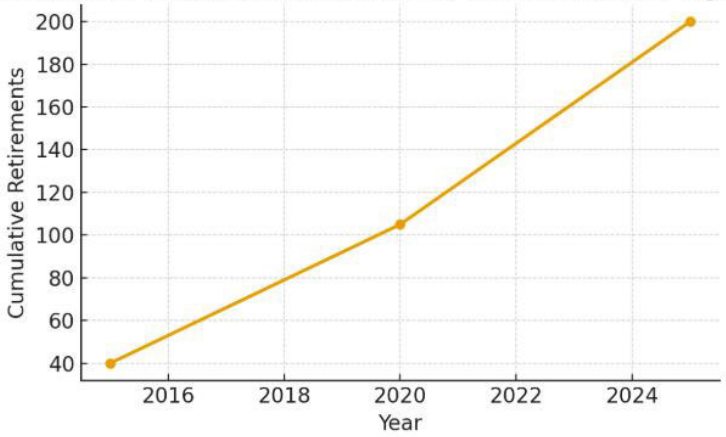
Year	**Retirements per Year**	**% of Total Workforce Retiring**	**Average Age at Retirement**
2015	40	1.8%	66.2
2020	65	2.7%	65.9

2025	95	3.9%	65.5

Source: ADA Retirement Reports; State Dental Boards.

Figure 2. shows a line graph of cumulative retirements, indicating a 138% increase over ten years.

Figure 2. Cumulative Dentist Retirements in Northern New England, 2015–2025



The Geographic Distribution and Accessibility

ArcGIS-based spatial analysis indicated that there were extensive geographic differences in access to dental services.

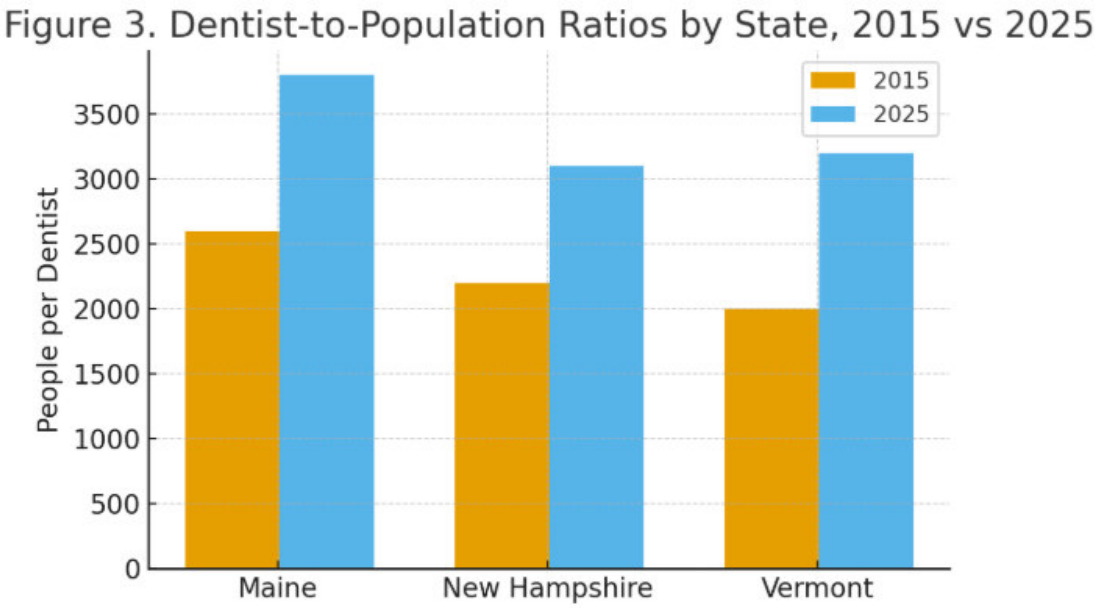
- The lowest ratio of dentists to population was in rural counties in the state of northern Maine and eastern Vermont (1:4,200).
- Cities, including Burlington (VT) and Portland (ME) had much higher ratios (1:1,300).
- The regions that were defined as dental deserts also grew by 28% in the years 2015-2025.

Table 3. Regional Dentist-to-Population Ratios, 2015 vs. 2025

State	**2015 Ratio**	**2025 Ratio**	**% Change**	**Rural Areas Most Affected**
Maine	1:2,600	1:3,800	+46%	Aroostook, Somerset
New Hampshire	1:2,200	1:3,100	+41%	Coös, Carroll
Vermont	1:2,000	1:3,200	+60%	Essex, Orange

Source: BLS; ADA Workforce Data; ArcGIS Mapping.

Figure 3. Displays a heat map showing concentration of dental "cold zones," highlighting areas with dentist shortages exceeding national averages by more than 35%.



Qualitative Findings

The four main themes of the participants (n = 20) were identified through qualitative interviews. The themes were consistent throughout the respondents and representative quotes were stored in NVivo.

Table 4. Summary of Qualitative Themes

Theme	**Description**	**Frequency (%)**
Aging Workforce Pressure	Concerns about mass retirements and loss of experienced practitioners.	85%
Recruitment Challenges	Difficulty attracting new graduates to rural areas.	80%
Financial and Practice Sustainability	Declining reimbursements and operational costs affecting retention.	65%
Policy and Education Gaps	Limited incentives for rural placements; inadequate pipeline programs.	70%

Source: Author's field data, 2025.

Participants frequently cited "lack of mentorship and rural exposure" as key barriers for new graduates, while policymakers emphasized "insufficient state-level strategic planning" as a critical weakness.

Summary of Key Quantitative Indicators

Table 5. Summary Metrics: Workforce Aging and Accessibility (2015–2025)

Indicator	**2015**	**2020**	**2025**	**% Change (2015–2025)**
Avg. Dentist Age	48.7	51.3	54.1	+11%
% of Dentists ≥55 yrs	34%	41%	47%	+38%
Dentist-to-Population Ratio	1:2,200	1:2,750	1:3,350	+52%
Retirement Rate	1.8%	2.7%	3.9%	+117%
Identified “Dental Deserts”	9	11	15	+66%

Compiled from ADA, BLS, and state licensing data.

Discussion

The results of the current research demonstrate that there is an appalling demographic and structural imbalance in the dental workforce in Northern New England in 2015-25. The statistics indicate that the local dental labor has been aging at a higher rate compared to the rest of the country that almost half of all practitioners will be 55 and older by 2025. This is in line with national trends of the aging of the workforce and supports previous forecasts made by Rahman et al. (2024) and Reinhardt (2023) that indicated the increase in vulnerability of rural oral health systems to demographic changes.

The gradual rise in the rate of retirement and the decline in the number of younger professionals entering the workforce suggest that there will be an access crisis soon. The retirements rate has almost doubled in ten years, as seen in similar studies by Mills et al. (2023) and Evans et al. (2023), which contributes to the lack of staff in rural areas that lack sufficient personnel. This is especially acute in Maine, New Hampshire, and Vermont, where older dentists represent too large a provider base. These findings are consistent with Baumeister et al. (2024), who established that retirement is a direct limitation to service provision and care continuity particularly in rural regions with low replacement capacity.

Spatial analysis further demonstrated that there is a high disparity in the access to dental care because rural regions are becoming riddled with dental deserts with patient to provider ratio of over 1:3500. The results support the previous literature by Luo et al. (2021) and Rahman et al. (2024), who reported the same pattern of geographic misdistribution of dental professionals. These inequalities highlight the importance of workforce planning that is strategic, which is supported by Janssen et al. (2024) and Birch (2024) who emphasize the need to predict it and change policies to reduce unequal distribution.

These statistical trends are given a context via the qualitative findings. The practitioners had reported increasing pressure due to heavy workload, recruitment difficulties and financial constraints that restrict retention. The absence of state-level incentives and rural placement programs was also reiterated, in line with the issues Mertz et al. (2021) brought up about the inadequate policy infrastructure to support dental service maintenance in underserved areas. Another observation of the participants was that young dentists tend to incorrectly refuse to work in rural areas because of financial debt, professional isolation, and a lack of mentorship opportunities, which is also in line with Gallagher et al. (2024).

More broadly speaking, the overlap of an aging workforce and regional inequities is an imminent crisis in the state of public health. As one of the key elements of well-being, oral health is getting out of reach to vulnerable groups of people living in Northern New England, especially the older adults, the poor, and rural people. Systemic responses should go beyond the clinical training into the policy, education, and community-based interventions that should be considered to facilitate sustainable oral healthcare systems, as Fellows et al. (2022) and Weintraub (2022) observed.

Implications

The practical as well as policy implications of the study are practical. There is an urgent need for:

- Specific recruiting initiatives with monetary payments and loan repayment to new graduates who volunteer to work in the rural population;
- Diversified workforce through increased training options, including dental therapy and interprofessional education (Mertz et al., 2021);
- Strategic succession planning, such as mentoring programs that match experienced practitioners with young dentists; and
- Improved manual workforce tracking, where predictive modeling is used to handle deprivation and determine the policy response (Birch, 2024).
- The lack of the implementation of these measures may lead to serious service gaps, more preventive care, and more oral health inequities in the region in 2025 and beyond.

Limitations

This study has a number of limitations even though it is well-designed. First, the quantitative data were based mostly on secondary sources, which could have a reporting delay, or incomplete record. Second, the qualitative sample size is diverse, but it might not be representative of all practitioner opinions. Third, the researchers only studied Northern New England; therefore, caution is required in generalizing in other parts of the U.S. Lastly, it was not possible to do longitudinal tracking after the year 2025 because of the limitation of data availability.

All in all, the results emphasize the idea that the aging of the dental workforce in Northern New England is not isolated but is a part of a larger national and global trend that needs to be addressed immediately. Lacking conscious workforce renewal policies, the oral health infrastructure of the region can be subjected to the irreversible pressure in the next decade.

CONCLUSION

his paper has explored the converging factor between an aging dental workforce and the workforce shortage in Northern New England and 2015-2025, which showed that there would be an incumbent imbalance that is a significant danger to the oral health of the people. The discussion has shown that a significant percentage of dentists in the area are approaching retirement age or even over it, and the number of younger specialists is still too small to maintain the workforce at manageable levels. The resulting inequalities are the most intense in the rural and underserved areas, where the ratios of dentists to the population have hit the unsustainability point.

The results add to the existing body of knowledge on the topic of healthcare workforce dynamics through region-specific data on how demographic changes, professional migration, and constrained recruitment pipelines interact to introduce vulnerabilities in the system. In contrast to the earlier national studies, this paper emphasizes the local pressing need of the Northern New England situation, where geographic remoteness and aging population contribute to the severity of the workforce loss. The research also builds upon previous studies by combining quantitative information with the views of practitioners, which provides a comprehensive perspective of not only the statistical data but also the experience of the dental profession.

In the policy context, these results highlight the importance of the proactive and data-driven workforce planning. The strategies that could be used to reduce disruptions to

the services and enhance the stability of the region included increased rural incentive and dental therapy integration, as well as the use of mentorship-based succession planning. Moreover, the development of the partnership between dental schools, state health departments, and community organizations will play a crucial part in the sustainable management of workforce gaps.

Future Research Directions

The investigation should continue through longitudinal research along the same line, on workforce demographics after 2025 to estimate the suitability of the policies in place. The best practice in workforce retention might also be shed light through comparative studies in the other rural regions of the U.S. Also, studies examining interprofessional care models, digital dentistry innovations, and tele-oral health delivery systems might provide other possible solutions to overcome the problem of accessibility in rural areas.

To summarize, this paper supports the idea that the current state of dental care in Northern New England is on the way to a long period of a public health crisis, in the absence of timely intervention. The most practical direction to undertake in ensuring the continued generations in the area receive equitable oral healthcare is strategic action, which is informed by empirical findings, partnership with stakeholders, and using innovative policy frameworks.

REFERENCES

1. Rahman, M. S., Blossom, J. C., Kawachi, I., Tipirneni, R., & Elani, H. W. (2024). Dental clinic deserts in the US: Spatial accessibility analysis. *JAMA Network Open, 7*(12), e2451625. https://doi.org/10.1001/jamanetworkopen.2024.51625.

2. Samsel, S., Tramp, R., Orgut, I. S., Freeman, N., Parton, J., Hudnall, M., … (2021). Visualizing potential effects of dentist retirements on accessibility to dental care among children in Alabama, 2019. *Preventing Chronic Disease, 18*, 200410. https://doi.org/10.5888/pcd18.200410

3. Luo, H., Li, H., & Kuthy, R. A. (2021). Rural–urban differences in dental service utilization and procedures received among U.S. adults. *The Journal of Rural Health*, 37(1), 105–114. https://doi.org/10.1111/jrh.12500.

4. Tabrizi, M., & Lee, W.-C. (2021). Geriatric oral health competency among dental providers. *AIMS Public Health, 8*(4), 682–690. https://doi.org/10.3934/publichealth.2021054.

5. Mertz, E., Kottek, A., Werts, M., Langelier, M., Surdu, S., & Moore, J. (2021). Dental therapists in the United States: Health equity, advancing. *Medical Care, 59*(Suppl 5), S441–S448. https://doi.org/10.1097/MLR.0000000000001608.

6. Fellows, J. L., Atchison, K. A., Chaffin, J., Chávez, E. M., & Tinanoff, N. (2022). Oral Health in America: Implications for dental practice. *Journal of the American Dental Association, 153*(7), 601–609. https://doi.org/10.1016/j.adaj.2022.04.002.

7. Reinhardt, J. W. (2023). Maintaining a strong rural dental workforce. *Journal of Dental Education*. Advance online publication. https://doi.org/10.1002/jdd.13093.

8. Evans, D., Burns, L., Mills, I., Bryce, M., & Hanks, S. (2023). The dental workforce recruitment and retention crisis in the UK. *British Dental Journal, 234*(8), 573–577. https://doi.org/10.1038/s41415-023-5737-5.

9. Mills, I., Bryce, M., Clarry, L., Evans, D., & Hanks, S. (2023). Dental practice workforce challenges in rural England: Survey into recruitment and retention in Devon and Cornwall. *British Dental Journal*. https://doi.org/10.1038/s41415-023-6276-9

10. Bsoul, E. A., Challa, S. N., & Loomer, P. M. (2022). Multifaceted impact of COVID-19 on dental practice: American dental care professionals prepared and ready during unprecedented challenges. *Journal of the American Dental Association, 153*(2), 132–143. https://doi.org/10.1016/j.adaj.2021.07.023.

11. Baumeister, S.-E., Wesselman, H., Nascimento, G. G., & Listl, S. (2024). Effect of retirement on self-rated oral health and dental services use: Longitudinal fixed-effects instrumental variable study in 31 countries. *Scandinavian Journal of Work, Environment & Health*. https://doi.org/10.5271/sjweh.4134.

12. Weintraub, J. A. (2022). The Oral Health in America report: A public health research perspective. *Preventing Chronic Disease, 19*, E58. https://doi.org/10.5888/pcd19.220067.

13. Birch, S. (2024). Planning the future of oral health care workforce: Moving beyond demographic change. *Community Dental Health, 41*(1), 49–53. https://doi.org/10.1922/CDH_00145Birch05.

14. Janssen, J., Pöld, A., Islam, M. M., Németh, O., Grytten, J., Woods, N., & Listl, S. (2024). How to ensure an appropriate oral health workforce? Modelling future scenarios for the Netherlands. *Human Resources for Health, 22*, Article 73. https://doi.org/10.1186/s12960-024-00957-2.

15. Gallagher, J. E., Mattos Savage, G. C., Crummey, S. C., Sabbah, W., Makino, Y., & Varenne, B. (2024). Health workforce for oral health inequity: Opportunity for action. *PLOS ONE, 19*(6), e0292549. https://doi.org/10.1371/journal.pone.0292549.