A National Study of the Practice Characteristics of Women in Dentistry and Potential Impacts on Access to Care for Underserved Communities

**Description and Policy Relevance:** Demographic changes within the dental profession including aging and gender distribution are affecting dental practice characteristics and practice locations. The OHWRC will collaborate with the American Dental Association (ADA) to conduct secondary data analyses to assess the impact of demographic changes in dentistry on access to oral health services, particularly in rural areas and for underserved populations.

Departures from the dental workforce in rural areas have more profound effects on the local population than departures in more populated areas; finding replacement dentists is particularly problematic in rural geographies. Dentists practicing in rural areas of the US are generally older and more often male than their urban and suburban counterparts. However, female dentists appear to be more likely to choose practice in the safety net to meet the needs of the underserved. The younger overall age of female dentists may account for their absence in rural areas in the past. The rural dental workforce is retiring or nearing retirement age at the same time that more racially and gender diverse dental school graduates are exhibiting preferences for urbanized practice locations. In 2015, female dentists represented 28.9% of the dental workforce and 48.6% of students enrolled in dental schools in the US in the academic year 2015-2016.

While there is discussion that the increasing gender diversity in dentistry will affect practice models, work hours, and the availability of specialty dentists or dentists in less populated areas, there is little research to describe variation in practice settings, work hours, and location. Understanding differences in practice characteristics by gender is important to anticipate changes in the professional workforce that might affect the availability of dental services in underserved areas. Workforce strategies to encourage dentists to choose rural practice are needed. In the absence of dental workforce, providers may need to increase the number of mobile dental services available in rural areas and policymakers may need to encourage further development of mid-level dental therapy workforce models to address the oral health needs of rural populations.

**Study Questions:** The proposed study questions are as follows:

1) How have age and gender differences in practice locations in 2005 changed in 2015?

2) Is there a difference in practice geography based on dentists’ characteristics, including demographics and practice-related factors?

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3) What strategies might be used to attract dentists to rural areas? What alternative workforce strategies might assure a sufficient supply of dental/oral health workforce in rural areas in the future?

**Design:** This study will use data from the ADA Masterfile for 2005 and 2015 and from its annual Survey of Dental Practice for 2015. The Masterfile is a database of all practicing and non-practicing dentists, in the US including individual level information about gender, age, specialty, and location of practice (zip codes). In 2015, the Masterfile listed 195,722 professionally active dentists in the 50 states and District of Columbia.

The Survey of Dental Practice data will be used to examine differences in practice location by dentists’ age, gender, type or class of employment, work hours, and patients served. These data are collected via a questionnaire mailed annually to a national random sample of all active dentists in private practice. The 2015 sample included 9,000 general practitioners and 6,000 specialists. The final data set consisted of 2,011 respondent dentists. The study protocol will also include a literature review to examine the impact of gender diversification among dentists and strategies to assure adequate workforce supply in rural areas.

**Analysis:** The data analyses will estimate differences in practice location and characteristics between male and female dentists by age cohorts. The estimates will be weighted to account for oversampling of specialists. All analyses will be conducted using SAS v.9.4 as follows:

- Gender differences in practice location (rural vs urban) by age cohorts in 2005 and 2015 will be described using frequencies and cross tabulations and will be quantified and tested for significance using Chi-square tests and Poisson regression models.
- Univariate and multivariable Poisson regression models with robust variance estimation (prevalence proportion ratios and 95% confidence intervals) will be used to assess the association of dentists’ practice location (rural vs urban) with demographics and practice characteristics, including age, gender, specialty, practice type, employment status, work hours, and patient insurance coverage. Effect modification will be evaluated by including two-way interactions among age, gender, and other predictor variables in the full regression model.
- An extensive literature review will be conducted to evaluate the impact of gender diversification in dentistry on dental services delivery and identify potential strategies (e.g., loan forgiveness, tax incentives, etc.) and alternative workforce models to assure an adequate supply of dentists, especially female dentists, in rural areas.

**Limitations:** Study limitations may result from the accuracy of self-reported information in the Survey of Dental Practice. The survey sample is weighted to be representative of the US dentist population by state, however a survey response bias by dentist characteristics is possible. This potential bias will be compensated for by weighting the data on dentists’ age and other variables.

**Data Sources:** The ADA has agreed to provide de-identified individual level data from the Association’s Masterfile for 2005 and 2015 and from the annual Survey of Dental Practice for 2015. A data use agreement will be executed with the ADA.

**Human Subjects Research:** The study involves human subjects. Since this project uses only secondary de-identified data, the work is expected to qualify as exempt research from Institutional Review Board approval.