

# Characteristics of the Current Dental Hygienist Workforce in Washington State

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## KEY FINDINGS

Demand for dental hygienists (DHs) in Washington is high and is limiting access to dental services in the state. Using data from state licensure records and a survey of DHs in the state, along with a variety of other sources, this report provides insights into who selects dental hygiene as a career and their pathways into this important oral health occupation, descriptions of the types and locations of their work, as well as DHs' views of their jobs and careers.

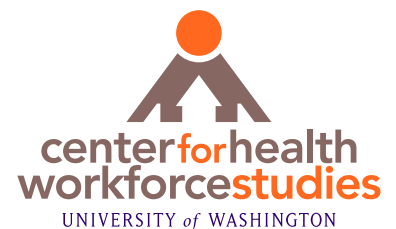
Survey findings suggest that about 84% of DHs with Washington licenses were practicing as a DH in the state. Analyses focused on these respondents, and key findings include:

- Nearly 98% of DH respondents working in Washington were female and 78% were white.
- Half of the DH respondents completed an associate degree and 45% completed a bachelor's degree in dental hygiene, and a quarter completed their dental hygiene education in a state other than Washington.
- Washington DHs working in public and non-profit settings, such as public health departments and community health centers, reported they worked more weekly hours on average (30.2 hours) and earned lower average hourly wages (\$55.32) compared with DHs in private practices where most DHs in the state were employed (26.8 hours and \$60.35).
- DHs in public and non-profit settings as well as DHs overall who worked more weekly hours (35 or more) reported receiving more employment benefits (including medical insurance, retirement, and paid time off) than DHs working in private settings or DHs overall who worked fewer (fewer than 35) weekly hours.

*Key Findings continued on next page*

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## KEY FINDINGS *continued*

- When asked their views of their jobs and careers, DH respondents were generally positive, but some indicated dissatisfaction with opportunities for growth and leadership development and opportunities for promotion in their jobs.
- Slightly more than half (55%) strongly agreed or agreed that they would recommend a career as a DH to a friend or relative.
- DHs reported recording health histories, performing subgingival planing, oral inspection, and applying topical fluorides and varnishes nearly every day. Just over half of DHs reported having ever applied silver diamine fluoride and about one quarter reported having ever placed and finished restorations.
- Most (89%) DH respondents reported experiencing pain or discomfort in the hands, wrists, arms, shoulders, or neck in the past 12 months, with 93% of those with pain attributing it to dental hygiene work. These findings are comparable to a similar Washington survey of DHs conducted in 2004.
- Despite some job dissatisfaction and high rates of musculoskeletal disorders (MSDs) attributed to their work, nearly three quarters of DH respondents planned to continue working as a DH in clinical practice over the next few years.

Conclusions from these findings include:

- Strategies to address the conditions and DH practices that contribute to MSDs could help to encourage DHs to work more weekly hours, reduce DH job vacancies, and help improve access to patient care.
- Extending the DH career pathway with more opportunities for advancing dental hygiene careers, including but not exclusively into dentistry, could make DH a career that attracts more, and more diverse, entrants.
- Ongoing tracking of the size, distribution, and characteristics of Washington's dental workforce is important to determine if and where progress is achieved to address oral health workforce issues in the state.

# Characteristics of the Current Dental Hygienist Workforce in Washington State

## INTRODUCTION

**Dental hygienists (DHs)** are an in-demand occupation in Washington State. DHs play an integral part in the oral health workforce and demand for DHs is expected to grow in the next ten years, which may continue to be a challenge to meet with current labor shortages for these positions.<sup>1-3</sup> Data obtained by the Washington Health Workforce Sentinel Network from oral health workforce employers has shown consistently high demand and long vacancies for open DH positions in the state.<sup>4</sup> The American Dental Association reports that 29% of dental practices are currently recruiting for DHs as well as other dental occupations, resulting in an 11% reduction in dental practice capacity.<sup>5</sup> This report uses a variety of data sources, including a new survey conducted by the University of Washington Center for Health Workforce Studies (UW CHWS) Washington Oral Health Workforce (WOHW) Tracking Program, to describe the supply, distribution, and characteristics of DHs in Washington.

Education routes to becoming a DH in Washington including completing an accredited associate or bachelor's degree program. Incumbent DHs can also pursue master's degrees in dental hygiene to advance their careers in leadership, health care, and education. Data from the U.S.

Department of Education's national database, Integrated Postsecondary Education Data System (IPEDS) provide insight into DH education trends in Washington. IPEDS data show that over the past 20 years completions have increased slightly, apart from fluctuations from 2020-2022 due to the Covid-19 pandemic (**Figure 1**). Following DH education, Washington state licensure requires a DH to successfully complete the Dental Hygiene National Board Exam and an approved clinical examination. From 2009 to 2023, the number of licensed DHs in Washington rose from 4,793 to 6,821, an increase of 42.3%.<sup>7</sup> A list of dental hygiene programs in the state and further details about these programs can be found on the UW CHWS WOHW dashboard.<sup>8</sup>

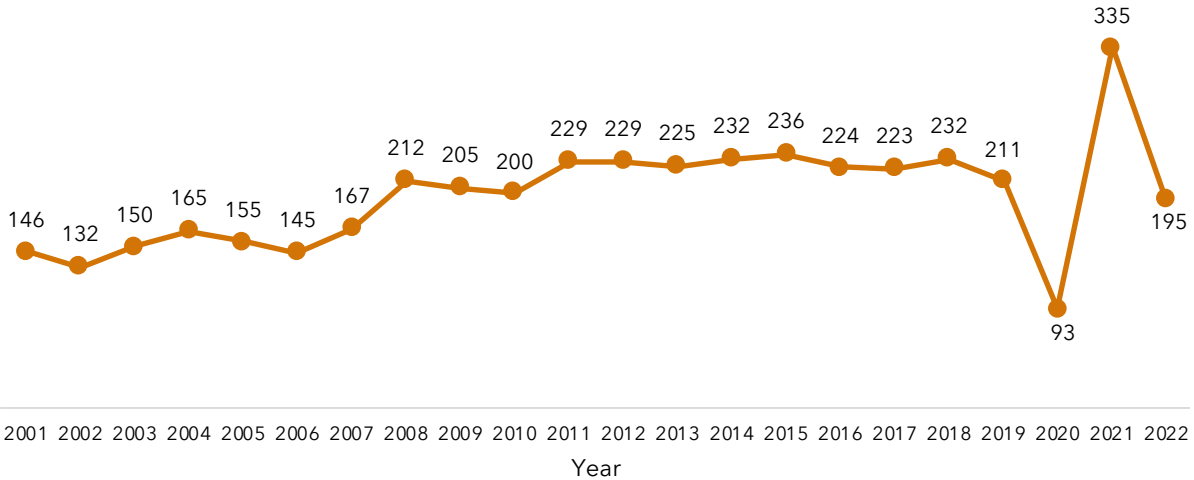
To better understand the state's DH workforce, we analyzed state licensure data from the Washington State Department of Health (which includes mailing address, age, and sex). In Washington, DHs are licensed by the Washington State Department of Health and must renew their license annually. **Figure 2** shows the distribution of licensed DHs by county in Washington. To understand DH workforce characteristics that are not collected as part of state licensing and are not available from other sources, we developed and conducted a statewide survey to inform education, recruitment, and retention of these important members of the oral health workforce.

### Dental Hygienists

Dental hygienists (DHs) work closely with dentists and dental assistants in dental offices providing patient care. DHs provide a range of services to promote oral health, including, but not limited to, oral health screening, preventive care, and oral health education to patients. DHs primarily work in dental offices and clinics, with smaller percentages working in other health care settings.<sup>1</sup> A licensed DH may remove deposits and stains from the surfaces of the teeth, place, polish, and smooth restorations, apply topical preventive or prophylactic agents, administer local anesthetics, administer nitrous oxide, and perform root planing and soft-tissue curettage (as authorized by RCW 18.29.050, WAC 246-817-550, WAC 246-817-560 and WAC 246-817-570).

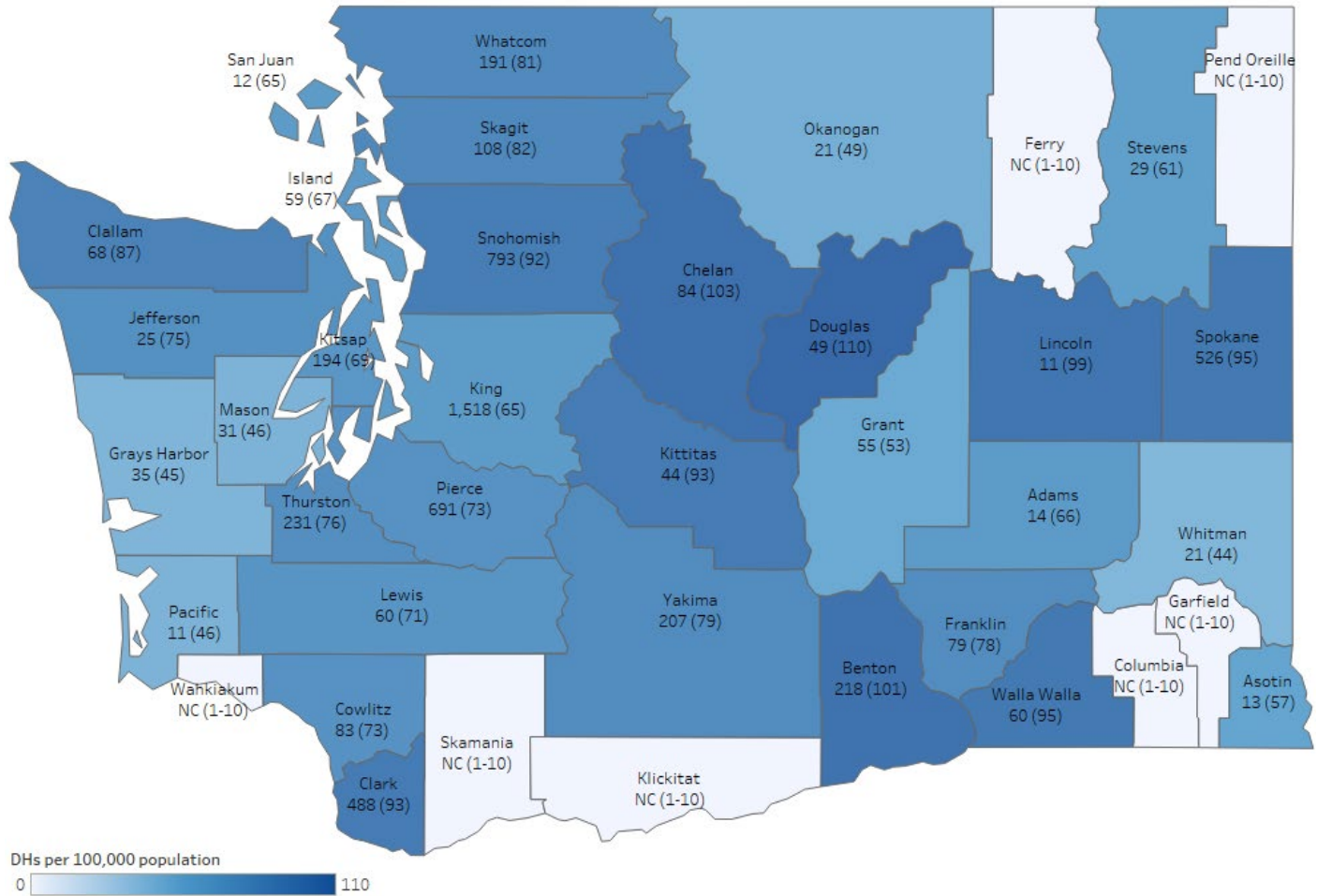
A subset of DHs, Direct Access Hygienists (DAHs), are able to treat patients without a licensed dentist's supervision if they have two years of clinical experience in the last five years in Washington, as authorized by RCW 18.29.056. DAHs may provide preventive services, but not perform injections, administer nitrous oxide, or diagnose for dental treatment. DAHs work in a variety of settings including schools, nursing homes or skilled nursing facilities, and correctional facilities, among others.<sup>6</sup>

**Figure 1. Dental Hygiene Program Completions in Washington State, 2001-2022**



Data source: The U.S. Department of Education's national database, Integrated Postsecondary Education Data System (IPEDS). IPEDS may not capture completions from programs that don't receive federal funding, or individuals who may have entered the profession through on-the-job training or apprenticeship arrangements.

**Figure 2. 2023 Licensed Washington Dental Hygienists with Washington Mailing Addresses per 100,000 Population (Count) by County, N=6,051**



Note: Number of active licenses (Number of active licenses per 100,000 population). Data source: 2023 licensure records. NC (1-10) indicates that the data are not calculated because fewer than 11 dental hygienists had a mailing address in these counties.

## SURVEY METHODS

### Sampling Frame

We identified 6,821 individuals licensed as DHs from Washington State Department of Health’s health professions license records as of December 2023. Of these, 6,316 DHs had email addresses associated with their licenses enabling us to send emails inviting them to participate in the online survey that was conducted between February and April 2024. Four percent (258) of email addresses had responses indicating that they were not functioning, resulting in a total of 6,058 remaining email addresses. To increase the response rate, individuals were sent up to eight reminder emails to participate. The online survey was administered using REDCap (grant number: UL1 TR002319), a secure web-based application.<sup>9-10</sup> Survey responses were linked to licensure data by UW CHWS based on email address, and each respondent was then assigned a random number to keep responses anonymous.

### Questionnaire

The DH survey questionnaire was developed specifically for this study, building upon previous surveys conducted by UW CHWS for dental assistants (DAs) and expanded function dental auxiliaries (EFDAs),<sup>11</sup> and using questions adapted, when possible, from other state and national surveys of the dental workforce and other health care occupations. Stakeholders involved in DH practice were consulted to refine the questionnaire for clarity, accuracy, and relevance. Questions addressed aspects of current employment such as current duties, wages, work characteristics (setting, location, hours worked, supervision), work history (years as a DH, additional occupation credentials), education and training history, job satisfaction, benefits, and demographic characteristics (**Appendix A**).

### Data Cleaning and Analysis

We produced descriptive statistics of survey responses including counts and percentages of responses, means, standard deviations, and ranges on select variables. All statistical analyses were performed using STATA/MP 16.1 (StatCorp, College Station, Texas 2020) and maps were created using Tableau Desktop 2022.4 (Tableau Software, LLC, Seattle, WA, 2022).

By linking to licensure data, we were able to assign any respondent’s missing age and gender based on their birth year from their license record. This decreased the number of respondents with missing age and gender data to less than 1%.

### Human Subjects

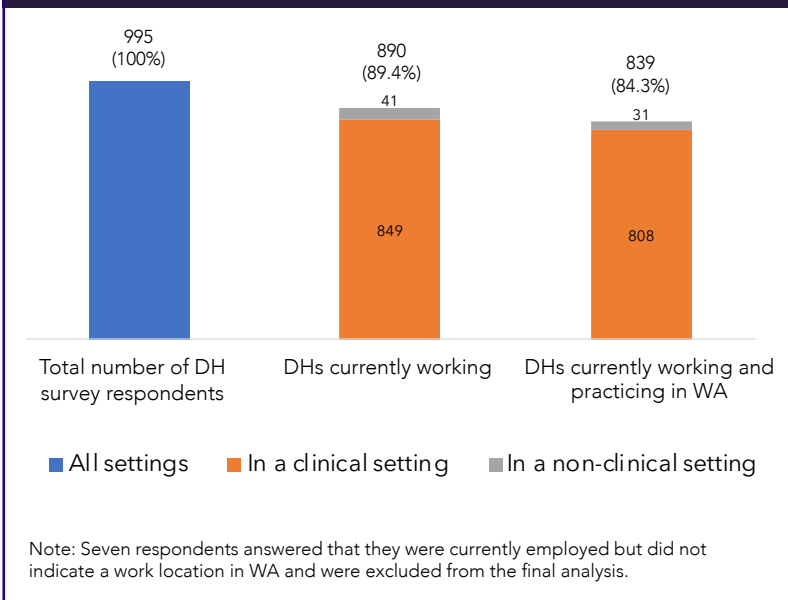
This study was determined to meet the federal “exempt” criteria for human subject review by the Washington State Institutional Review Board.

### Response Rate and Potential Response Bias

The overall DH response rate was 16.4% (995 responses out of 6,058 initial email contacts). The response rate likely appears lower than if we had been able to determine the disposition of all emails because the survey software was unable to identify email addresses that were not functional beyond those that bounced with an “undeliverable” message. This low number of responses was expected given comparable experiences reported with online surveys of health care workers.<sup>12-13</sup>

Of the 995 survey respondents, 890 (89.4%) reported currently working as a DH, and 84.3% were working in Washington (determined by respondent’s primary work location ZIP Code) (**Figure 3**). Currently working respondents were also asked if they worked in a clinical or non-clinical (e.g., education, research, or administrative) setting. Oregon, Idaho, and Arizona were the three other most frequently listed states where Washington-licensed DHs were currently working. Subsequent analyses in this report focus on the 839 DHs who responded to the survey as currently working as a DH in Washington state, unless otherwise noted.

**Figure 3. Practice Status of Washington (WA) Dental Hygienist (DH) Survey Respondents**



We estimated response bias by comparing age, sex, and geographic location of respondents to all licensed DHs in Washington. We were unable to assess the representativeness of the sample based on race/ethnicity as this information is not included in state licensing data. Survey respondents skew slightly older than the state age distribution of DH license holders. Based on state licensure data, in 2023 the average age of licensed DHs in Washington State was 44.6 years: 63.9% of all licensed DHs were between the ages of 30 and 54, less than 10% of DHs were ages 25-29 (**Appendix B**). A two-sample t-test of means showed that the mean age of all survey respondents (46.4 years) was statistically significantly older than the state average of 44.6 years ( $p < 0.001$ ). The survey responses contain a higher proportion of respondents 45-49 years old compared to all DH license holders (13.3% vs 10.4%) and a lower proportion of those 25-29 years old (6.7% vs. 9.0%) and 35-39 years old (12.0% vs. 15.0%).

Almost all (96.0%) of DHs in Washington were female in 2023 according to licensure data and our sample of DH survey respondents currently working in Washington is 97.5% female. A Pearson chi-squared test confirmed that the gender distribution of the respondents is the same as DHs licensed in the state ( $p > 0.05$ ), indicating that survey respondents are representative of all DH license holders in Washington in terms of gender (**Appendix B**).

We estimated geographic representativeness of respondents at two levels: eastern Washington compared with western Washington, and by Accountable Community of Health (ACH) designation (**Appendix B**). There are nine ACHs in Washington, each composed of one or more counties and representing a unique region of the state.<sup>14</sup> We compared the relative distribution of survey respondents based on survey-collected primary work location to the distribution of license mailing address, using county assignments made via a ZIP Code-to-county crosswalk. We conducted Pearson chi-squared tests of independence between the ACH distribution of the survey respondents and licensed DHs in the state, and between the regional distribution of eastern and western Washington. We found no significant difference between respondents and licensed DHs at the eastern vs. western region levels ( $p > 0.05$ ), nor did we find significant differences between the survey respondents and all licensed DHs at the ACH level ( $p > 0.05$ ).

## SURVEY FINDINGS

### Practice Status

Most (89.5%) DH respondents indicated that they were currently working as a DH, and almost all were working in a clinical setting (85.3%), while 10.6% of respondents indicated that they were not currently working as a DH (**Table 1**).

**Table 1. Practice Status of all Washington Dental Hygienist (DH) Survey Respondents, N=995**

|  | All Responding DHs |
|--|--------------------|
| Currently working as a dental hygienist                      | 89.5%              |
| In a clinical setting  | 85.3%              |
| In a non-clinical setting (e.g., education, research, admin) | 4.1%               |
| Not currently working as a dental hygienist                  | 10.6%              |
| Retired or didn't specify a reason                           | 3.5%               |
| Have a disability that prevents me from working              | 2.0%               |
| Caring for children  | 1.5%               |
| Working in another position, not in health care              | 1.4%               |
| Working in another position in health care                   | 1.3%               |
| Unemployed, not seeking work as a dental hygienist           | 0.8%               |
| Unemployed, seeking work as a dental hygienist               | 0.0%               |

### Demographic Characteristics

Nearly all respondents (97.5%) identified as female (**Table 2**). Two-thirds of respondents lived in a two-adult household and 43.5% had at least one child in their household. Of respondents residing in Washington, 21.4% (n=161) reported a residence in a Washington state-designated rural county as defined by the State of Washington Office of Financial Management: “a county with a population density less than 100 persons per square mile.”<sup>15</sup> The mean age of DH respondents working in Washington was 45.2 years and over two-thirds were over age 50 (36.8%).

**Table 2. Gender and Household Characteristics of Dental Hygienist (DH) Survey Respondents Currently Working as Dental Hygienist in Washington, N=839**

|  | DHs in WA           |
|--|---------------------|
| <b>Gender</b>                            |                     |
| Female                                   | 97.5%               |
| Male                                     | 2.3%                |
| Non-binary/other term                    | 0.2%                |
| <b>Age, years</b>                        |                     |
| Mean (SD) [range]                        | 45.5 (12.3) [22-80] |
| Under 25                                 | 1.2%                |
| 25-29                                    | 7.7%                |
| 30-39                                    | 26.8%               |
| 40-49                                    | 27.6%               |
| 50-59                                    | 21.4%               |
| 60+                                      | 15.4%               |
| <b>Estimated Annual Household Income</b> |                     |
| Less than \$20,000                       | 0.3%                |
| \$20,000 – 34,999                        | 0.3%                |
| \$35,000 – 49,999                        | 1.0%                |
| \$50,000 – 74,999                        | 5.8%                |
| \$75,000 – 99,999                        | 14.5%               |
| \$100,000 – 149,999                      | 30.4%               |
| \$150,000 - \$199,999                    | 25.6%               |
| \$200,000 or more                        | 22.2%               |
| <b>Household Type</b>                    |                     |
| Single adult household, with children    | 4.2%                |
| Single adult household, without children | 11.2%               |
| Two adult household, with children       | 31.3%               |
| Two adult household, without children    | 35.5%               |
| 3+ adult household, with children        | 8.0%                |
| 3+ adult household, without children     | 9.9%                |
| <b>Geographic Location of Residence</b>  |                     |
| Washington                               | 97.3%               |
| Rural                                    | 21.4%               |
| Urban                                    | 78.6%               |
| Other state or unknown                   | 2.7%                |

Note: Geographic location based on respondent's home ZIP code. Rural designation based on Washington state rural county definition. Percent calculations do not include missing data. Missing values: age (2, 0.2%), gender (1, 0.1%), annual income (128, 15.3%), household type (78, 8.1%), residence location (67, 8.0%).

**Table 3. Race or Ethnicity of Dental Hygienist (DH) Survey Respondents Currently Working in Washington, N=839**

| Race/Ethnicity                            | Race or ethnicity of DHs in WA (categories not mutually exclusive)* | Race or ethnicity of DHs in WA by single vs. multiple race/ethnicity (mutually exclusive categorization) |
|---|---|--|
| American Indian or Alaskan Native         | 2.5%  | 0.3%   |
| Asian                                     | 8.8%  | 6.1%   |
| Black or African American                 | 1.8%  | 1.3%   |
| Hispanic or Latino                        | 7.5%  | 5.5%   |
| Arab, Middle Eastern, or North African    | 0.5%  | 0.3%   |
| Native Hawaiian or Other Pacific Islander | 0.5%  | 0.1%   |
| White                                     | 84.8%   | 78.2%  |
| Other race                                | 1.4%  | 1.0%   |
| Selected multiple race/ethnicity          | N/A   | 7.3%   |

\*Percentages exceed 100% because respondents were allowed to check all that apply. Note: Percent calculations do not include missing data (68, 8.1%).

Among DH survey respondents, 15.2% identified as belonging to underrepresented racial or ethnic minority groups (American Indian or Alaska Native; Black or African American; Hispanic or Latino; Native Hawaiian or other Pacific Islander)<sup>16</sup> when selecting one or more race or ethnicity categories, 7.3% of respondents identified as two or more races (**Table 3**).

**Table 4. Educational Background of Dental Hygienist (DH) Survey Respondents Currently Working in Washington, N=839**

|  | DHs in WA |
|--|-----------|
| Location of initial dental hygienist education/training        |           |
| Washington state   | 75.6%     |
| Another US state or territory                                  | 23.7%     |
| Outside the US   | 0.6%      |
| Type of dental hygiene educational/training programs completed |           |
| Associate degree   | 49.9%     |
| Bachelor's degree  | 45.4%     |
| Post-baccalaureate/graduate (Master's or Doctoral)             | 3.5%      |
| Other  | 0.5%      |
| Years since completion of initial dental hygiene training*     |           |
| 5 years or fewer (2019 – 2024)                                 | 15.6%     |
| 6 – 10 years (2014 – 2018)                                     | 16.7%     |
| 10+ years (2013 or earlier)                                    | 67.7%     |
| Licensed as a dental hygienist in a state in addition to WA    |           |
| Yes  | 22.4%     |
| Other academic degrees completed (not in dental hygiene)       |           |
| N/A – have not completed any other degree programs             | 29.1%     |
| Associate degree   | 33.5%     |
| Bachelor's degree  | 22.8%     |
| Post-baccalaureate/graduate degree                             | 6.6%      |
| Other  | 2.9%      |

\*As of survey completion, 2024. Note: Percent calculations do not include missing data. Missing values: location of DH training (51, 6.1%); year of DH training (71, 8.5%); registration/license in another state (57, 6.8%). Other includes dental assisting programs of unspecified training types, and additional programs of unspecified degree types.

### Education and Training

Three-quarters (75.6%) of DH survey respondents currently working in Washington received their initial DH education or training in Washington state (**Table 4**). About half of respondents completed an associate degree in dental hygiene (49.9%) and 45.4% completed a bachelor's degree in dental hygiene. Over two-thirds (67.7%) of respondents completed their initial DH training more than ten years ago (2013 or earlier), with 16.7% having completed their education six to ten years ago (between 2014-2018), and 15.6% having completed their education within the past five years. The mean age of respondents who received an associate degree in dental hygiene was about five years older than respondents who only received a bachelor's degree in dental hygiene (47.4 years vs. 42.6 years,  $p < 0.001$ ).



## Work History

On average, DH survey respondents had been practicing in Washington for 16 years and practicing as a DH (both in Washington and elsewhere) for 17.7 years (**Table 5**). Half of respondents indicated that they worked in another dental position prior to becoming a DH (50.6%). Among those with previous dental experience, 83.2% had worked as a dental assistant and 25.6% worked in an administrative position.

**Table 5. Work History of Dental Hygienist (DH) Survey Respondents Currently Working in Washington (WA), N=839**

|  | DHs in WA          |
|--|--------------------|
| Total years as a practicing dental hygienist in WA   |                    |
| Mean (SD) [Range]  | 16.0 (12.0) [0-54] |
| Total years as a practicing dental hygienist (both in WA and elsewhere)                                      |                    |
| Mean (SD) [Range]  | 17.7 (12.5) [0-62] |
| Worked in other dental position prior to becoming a DH   | 50.6%              |
| <b>Previous dental position held among DHs who worked in another dental position prior to becoming a DH*</b> | <b>n=411</b>       |
| Dental assistant   | 83.2%              |
| Expanded function dental auxiliary   | 5.1%               |
| Administration (e.g., front office, billing)   | 25.6%              |
| Sterilization  | 7.5%               |
| Dental lab technician  | 0.7%               |
| Other  | 2.7%               |

\*Participants could select more than one option; percent calculations may not add up to 100%.

Note: Percent calculations do not include missing data. Missing values: years of experience in WA (18, 2.2%); total years of experience (25, 3.0%); and previous dental experience (26, 3.1%). Other includes dentist in a foreign country, volunteer work, dental supply work, x-ray technician, and orthodontic assistant.

## Current Work Environment & Current Job Characteristics

Among currently working DH survey respondents in Washington, 90.1% were permanent employees at their primary work locations (**Table 6**). Most DHs currently working in Washington also reside in the state (89.5%). Of DH survey respondents that both live and work in Washington, a majority (82.8%) live and work within the same county (**Figure 4**). However, only 27.3% and 42.9% of respondents from Franklin or Lewis County both live and work in Franklin County and Lewis County, respectively. Direct access hygienists (DAHs) make up 1.1% of the sample of DH survey respondents currently working in Washington.

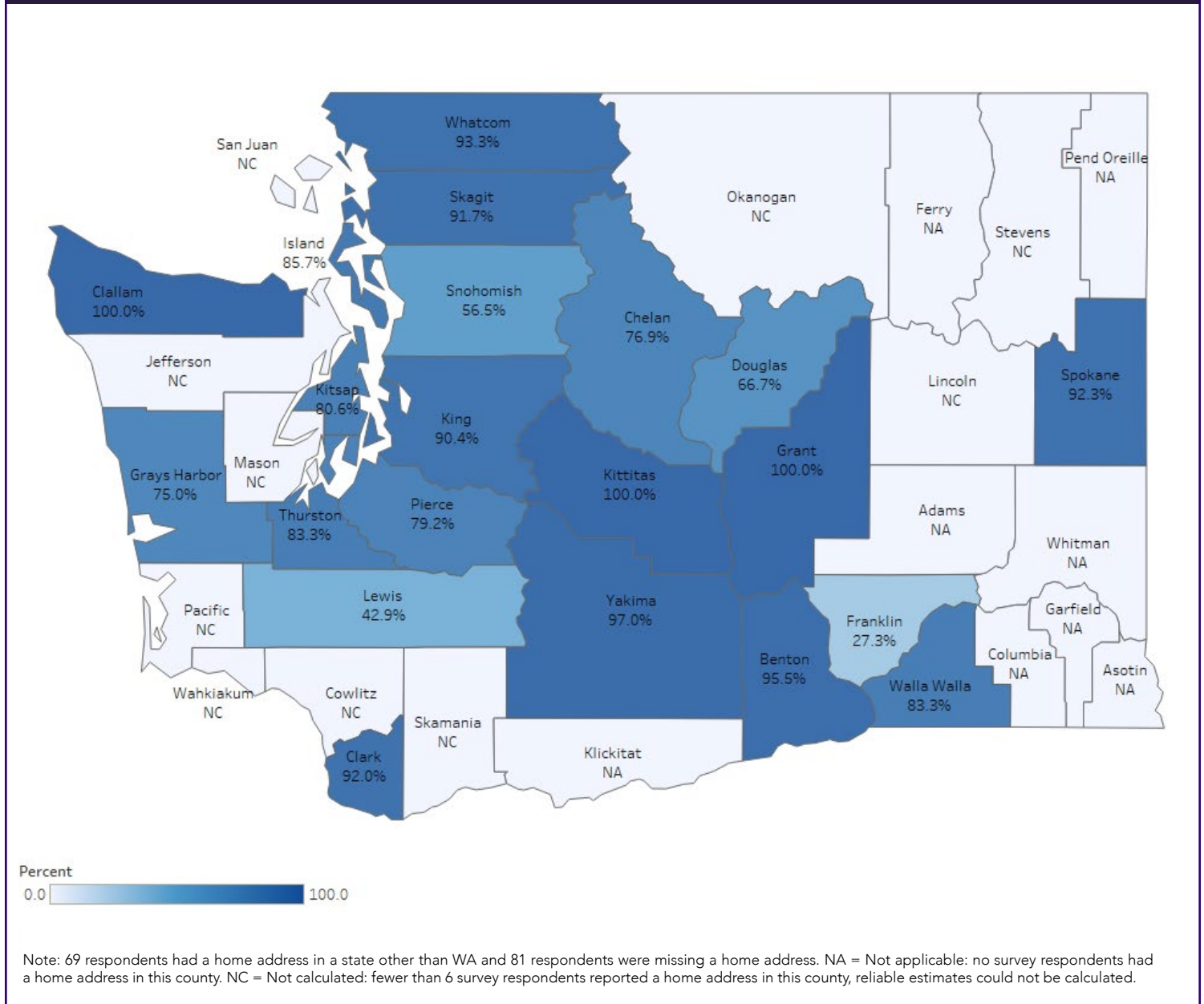
**Table 6. Employment Status of Dental Hygienist (DH) Survey Respondents Currently Working in Washington, N =839**

|   | DHs in WA |
|---|-----------|
| Currently working as a dental hygienist           |           |
| Permanent employee                                | 90.1%     |
| Temporary: not employed through a staffing agency | 6.2%      |
| Temporary: employed through a staffing agency     | 2.2%      |
| Direct access hygienist*                          | 1.1%      |
| Other   | 0.5%      |

Note: Percent calculations do not include missing data. Missing values: 4, 0.5%.

\*Direct access hygienists are authorized by RCW 18.29.056.

**Figure 4. Percentage of Dental Hygienist (DH) Survey Respondents Currently Working in Washington Living and Working in the Same County, N=751**



**Table 7. Primary Work Location Characteristics of Dental Hygienist (DH) Survey Respondents Currently Working in Washington, N=839**

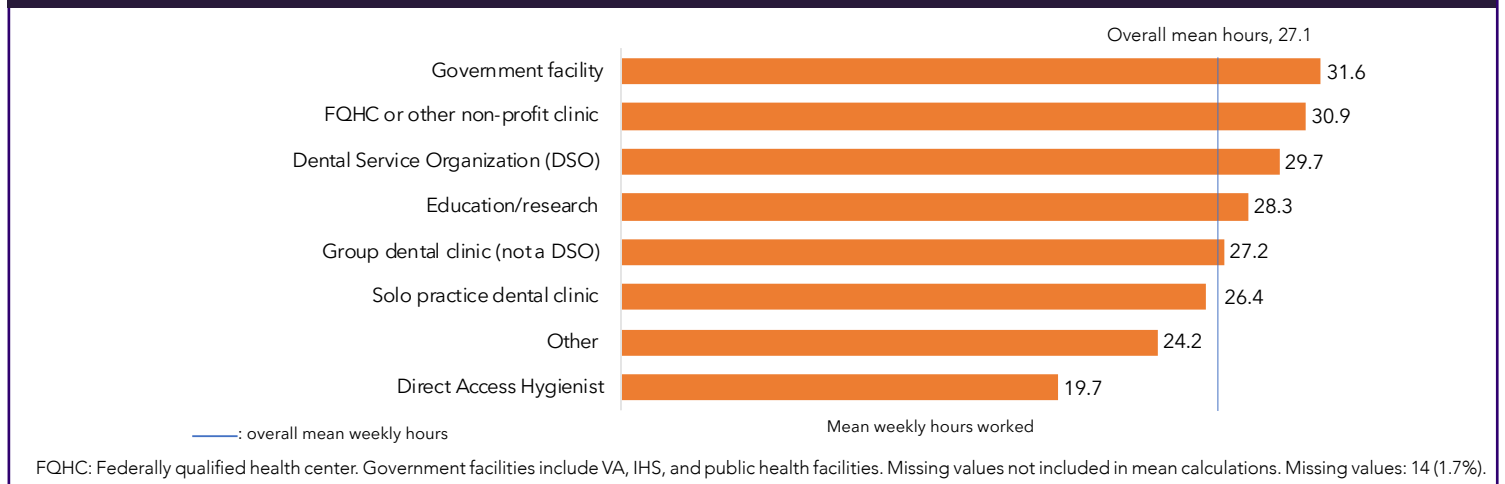
| DHS in WA  |       |
|--|-------|
| Primary work location  |       |
| Solo practice dental clinic                                  | 68.5% |
| Group dental clinic (not a DSO)                              | 12.4% |
| Dental Service Organization (DSO)                            | 7.1%  |
| FQHC or other non-profit community clinic                    | 5.6%  |
| Education/research   | 3.1%  |
| Government facility (VA, IHS, Public Health)                 | 1.3%  |
| Direct Access Hygienist (DAH)                                | 0.8%  |
| Other  | 1.1%  |
| Number of dentists practicing at primary work location       |       |
| 0  | 1.0%  |
| 1  | 47.1% |
| 2-5  | 48.8% |
| 6-10   | 2.8%  |
| 10+  | 0.4%  |
| Main dental focus of primary work location                   |       |
| General practice   | 86.6% |
| Specialty or referral (e.g., perio, restorative, pediatrics) | 4.8%  |
| Both (general and specialty/referral)                        | 7.9%  |
| Other  | 0.8%  |

Note: Direct access hygienists are authorized by RCW 18.29.056. VA: Veterans Affairs; IHS: Indian Health Services. Percent calculations do not include missing data. Missing values: office type (5, 0.6%); number of dentists (42, 5.0%); and dental focus (41, 4.9%).

DHs reported primarily worked at solo practice dental clinics (68.5%), followed by group dental clinics that were not part of a dental service organization (12.4%) and Dental Service Organizations (DSOs) (7.1%) (Table 7). DAHs (n=7) reported primarily working in school-based settings (71.4% of those who said they were a DAH, not tabled). DHs' 'Other' primary work locations mentioned included testing agencies, cancer centers, and consulting. DHs most commonly reported the number of dentists practicing at these locations as either one (47.1%) or 2-5 (48.8%). Most respondents reported the dental focus of their primary work locations as general practice (86.8%).

Of the DH respondents currently working in Washington, 77.2% worked in a single, primary location and less than one-fifth of respondents (17.6%) worked in a second location in addition to their primary work location (Table 8). The majority of these second locations were also in Washington (94.7%, not tabled). DH respondents reported they made an hourly wage that averaged \$59.80 per hour and worked an average of 27.1 hours per week. DHs working at government facilities (including Indian Health Service, Veterans Affairs, and public health clinics) and federally qualified and other non-profit clinics worked the most weekly hours, on average (31.6 and 30.9 hours per week, respectively), while DAHs worked the least (19.7 hours per week) (Figure 5). When asked "are you compensated for working overtime (past set hours)

**Figure 5. Mean Weekly Work Hours by Primary Work Location of Dental Hygienist (DH) Survey Respondents Currently Working in Washington, N=839**



at your primary work location?”, less than one-third of respondents (30.1%) answered “yes”, but overtime compensation for working past set work hours was not applicable to 41.5% of respondents. Two-thirds of DH respondents (66.5%) were satisfied with the number of hours they were working per week, just under one-third of respondents (31.1%) indicated that they would like to work fewer hours per week, and only 2.4% indicated that they would like more hours (**Table 8**).

**Table 8. Hours and Pay of Dental Hygienist (DH) Survey Respondents Currently Working in Washington (WA), N=839**

| DHs in WA   |                         |
|---|-------------------------|
| Number of work locations                                |                         |
| One location  | 77.2%                   |
| Two locations   | 17.6%                   |
| Three or more locations                                 | 4.9%                    |
| Average estimated hourly wage                           |                         |
| Mean (SD) [Range]                                       | \$59.80 (10.9) [10-200] |
| Compensation for overtime (when working past set hours) |                         |
| Yes   | 30.1%                   |
| No  | 28.4%                   |
| Not applicable  | 41.5%                   |
| Average hours/week at primary work location             |                         |
| Mean (SD) [Range]                                       | 27.1 (10.1) [0-90]      |
| Currently working as many hours as would like as a DH   |                         |
| Yes – number of hours worked per week is about right    | 66.5%                   |
| Would like to work fewer hours per week                 | 31.1%                   |
| Would like to work more hours per week                  | 2.4%                    |

Note: Percent calculations do not include missing data. Missing values: working in two locations (7, 0.8%), working in three or more locations (3, 1.6% of those who indicated working in two locations); hourly wage (27, 3.2%); overtime compensation (12, 1.4%); work hours (10, 1.2%); and satisfaction with work hours (13, 1.6%).

**Table 9** shows employment benefits received by DH survey respondents currently working in Washington by primary work location setting. We compared benefits received, average weekly work hours, and hourly pay by office setting type. We further grouped the primary work locations into three setting types (**Table 7**): private practice (solo practice dental clinic, group dental clinic [not a DSO], and Dental Service Organization [DSO]); public/non-profit setting (FQHC or other non-profit community clinic, education/research, government facility); and other (DAH or other setting type, including testing agencies, cancer centers, and consulting). Most respondents (88.0%) work in a private office setting, 10.1% work in a public/non-profit office, and just under 2% of respondents work in another setting type or are DAHs. When examining if respondents were “currently working as many hours as [they] would like as a DH,” there were no significant differences between those working in public or private settings (**Table 8**, analysis not shown).

On average, DHs working in public/non-profit settings worked more hours per week compared to DHs working in private settings and ‘other’ settings (30.2 hours per week compared to 26.8 and 21.9 hours per week, respectively) (**Table 9**). Despite working more weekly hours, these public/non-profit employees made about \$5 per hour lower average hourly wage than their privately employed DH counterparts (\$55.32 per hour vs. \$60.35,  $p < 0.001$ ). DHs employed in public/non-profit setting received more employment benefits than DHs working in other settings. For example, 76.2% of public/non-profit employed DHs reported receiving medical benefits with employer contribution (e.g., health insurance), compared to 42.0% of private DHs and 31.3% of ‘other’ DHs ( $p < 0.001$ ). Among all DH respondents, the other most common employment benefits included paid time off (82.0%), retirement benefits with employer contribution (61.6%), supplies (50.2%), paid continuing education (47.2%), and dental benefits with employer contribution (46.6%, in all settings). Higher percentages of DHs employed in public or non-profit settings reported receiving these benefits than DHs working in private settings (all statistically significant at  $p = 0.001$ ), except for receiving benefits for supplies such as scrubs and personal protective equipment (PPE). There were no statistically significant differences between the DHs employed in private, public/non-profit, and other/DAH workers who received medical, dental, or retirement benefits without employer contribution, as well as supplies, bonuses, and travel and transportation (mileage, public transportation, office trips). Public/non-profit employed DHs received more ‘other’ insurance benefits (i.e., disability insurance, life insurance, vision insurance) compared to DHs in other work settings ( $p < 0.001$ ), as well as wellness benefits (monthly wellness stipend, gym

memberships; 0.3% of private DHs vs. 6.0 and 6.3% of public/non-profit DHs and DAHs, respectively,  $p < 0.001$ ). 'Other' benefits DH respondents reported receiving included reimbursement or coverage of license fees, childcare, team lunches, and Costco memberships.

**Table 9. Hours Worked, Hourly Wage, and Employment Benefits of Dental Hygienist (DH) Survey Respondents Currently Working in Washington (WA) by Primary Work Location Setting, N=839**

|  | DHs by Work Setting |                      |                                    |                    | p-value          |
|--|---------------------|----------------------|------------------------------------|--------------------|------------------|
|  | All DHs in WA       | Private <sup>1</sup> | Public/<br>Non-profit <sup>2</sup> | Other <sup>3</sup> |                  |
|  | N = 839             | n=734                | n=84                               | n=16               |                  |
| Average hours/week at primary work location      |                     |                      |                                    |                    |                  |
| Mean (SD)  | 27.1 (10.1)         | 26.8 (9.7)           | 30.2 (12.3)                        | 21.9 (14.5)        | <b>0.003</b>     |
| Average estimated hourly wage                    |                     |                      |                                    |                    |                  |
| Mean (SD)  | \$59.75 (10.9)      | \$60.35 (10.4)       | \$55.32 (12.1)                     | \$54.98 (19.5)     | <b>&lt;0.001</b> |
| Employment benefit                               |                     |                      |                                    |                    |                  |
| Paid time off (e.g., sick leave and/or vacation) | 82.0%               | 81.9%                | 89.3%                              | 50.0%              | <b>0.001</b>     |
| Medical benefits (e.g., health insurance)        |                     |                      |                                    |                    |                  |
| No employer contribution                         | 9.5%                | 9.7%                 | 9.5%                               | 0.0%               | 0.426            |
| With employer contribution                       | 45.2%               | 42.0%                | 76.2%                              | 31.3%              | <b>&lt;0.001</b> |
| Dental benefits                                  |                     |                      |                                    |                    |                  |
| No employer contribution                         | 21.1%               | 21.8%                | 16.7%                              | 12.5%              | 0.383            |
| With employer contribution                       | 46.6%               | 44.6%                | 66.7%                              | 37.5%              | <b>&lt;0.001</b> |
| Retirement benefits                              |                     |                      |                                    |                    |                  |
| No employer contribution                         | 7.2%                | 7.2%                 | 7.1%                               | 6.3%               | 0.989            |
| With employer contribution                       | 61.6%               | 59.9%                | 79.8%                              | 43.8%              | <b>0.001</b>     |
| Supplies (e.g., scrubs, PPE)                     | 50.2%               | 51.1%                | 45.2%                              | 37.5%              | 0.351            |
| Paid continuing education                        | 47.2%               | 45.4%                | 67.9%                              | 25.0%              | <b>&lt;0.001</b> |
| Bonuses  | 41.4%               | 42.2%                | 32.1%                              | 43.8%              | 0.193            |
| Other insurance                                  | 1.7%                | 1.1%                 | 7.1%                               | 0.0%               | <b>&lt;0.001</b> |
| Transportation                                   | 1.1%                | 1.1%                 | 1.2%                               | 0.0%               | 0.912            |
| Wellness   | 1.0%                | 0.3%                 | 6.0%                               | 6.3%               | <b>&lt;0.001</b> |
| Other  | 3.1%                | 2.7%                 | 6.0%                               | 6.3%               | 0.209            |
| No response to any                               | 7.6%                | 7.1%                 | 6.0%                               | 37.5%              | <b>&lt;0.001</b> |

<sup>1</sup>Private setting includes solo dental practice, Dental Service Organization (DSO), group dental practice (not a DSO).

<sup>2</sup>Public setting includes government, FQHCs, education/research.

<sup>3</sup>Other setting includes direct access hygienists (n=7) and other setting types, such as testing centers and cancer centers.

Note: percentages do not add up to 100 because respondents were allowed to check all that apply. Missing values are not included in mean calculations or percentages. Missing values: primary work setting, overall: 5. In addition: work hours, private setting: 4; work hours, public setting: 1; work hours, DAH: 4; hourly wage, private setting: 21; hourly wage, public setting: 4; hourly wage, DAH: 1.

P-values represent statistical significance between groups, determined by Analysis of Variance test for average hours and average wage, and Pearson chi2 test for all others. **Bold** indicates statistical significance at 0.05.

**Table 10. Employment Benefits of Dental Hygienist (DH) Survey Respondents Currently Working in Washington by Weekly Work Hours, N=839**

| Benefit  | DHs receiving benefit | DHs receiving benefit among employees working 35 hours/ week or more | DHs receiving benefit among employees working fewer than 35 hours/week | p-value          |
|--|-----------------------|--|--|------------------|
|  |                       | n=224  | n=605  |                  |
| Paid time off (e.g., sick leave and/or vacation) | 82.3%                 | 95.1%  | 77.5%  | <b>&lt;0.001</b> |
| Medical benefits (e.g., health insurance)        |                       |  |  |                  |
| No employer contribution                         | 9.5%                  | 15.2%  | 7.4%   | <b>0.001</b>     |
| With employer contribution                       | 45.6%                 | 72.3%  | 35.0%  | <b>&lt;0.001</b> |
| Dental benefits                                  |                       |  |  |                  |
| No employer contribution                         | 21.2%                 | 17.4%  | 22.6%  | 0.102            |
| With employer contribution                       | 46.9%                 | 62.1%  | 41.3%  | <b>&lt;0.001</b> |
| Retirement benefits                              |                       |  |  |                  |
| No employer contribution                         | 7.2%                  | 7.6%   | 7.1%   | 0.812            |
| With employer contribution                       | 61.9%                 | 78.1%  | 55.9%  | <b>&lt;0.001</b> |

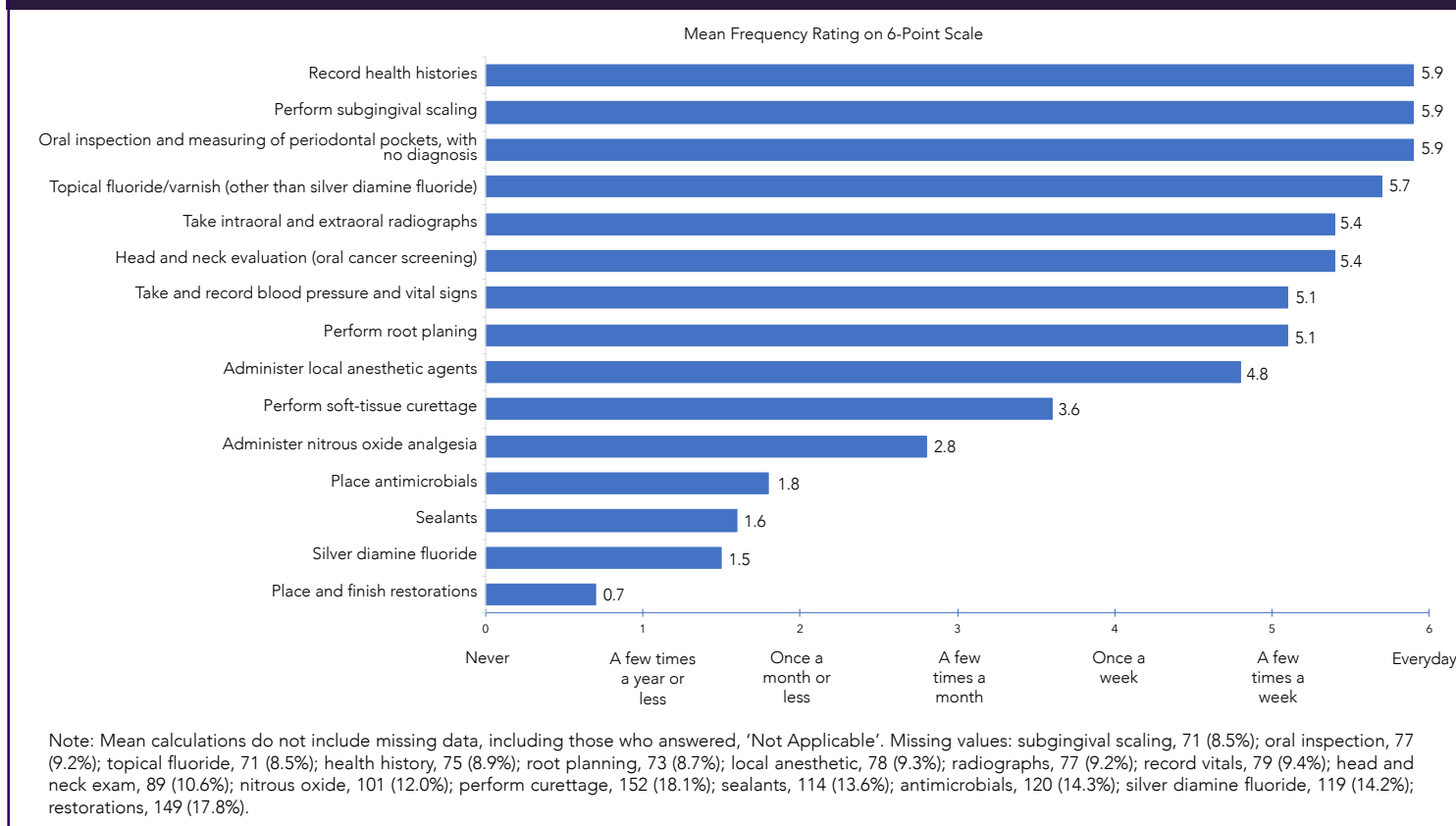
Note: percentages do not add up to 100 because respondents were allowed to check all that apply. Missing values are not included in mean calculations or percentages. P-values represent statistical significance between groups, determined by Analysis of Variance test for average hours and average wage, and Pearson chi2 test for all others. Bold indicates statistical significance at 0.05.

**Table 10** shows the most common employment benefits received by DH survey respondents currently working in Washington by weekly work hours. We compared benefits received by those working 35 hours a week or more to those working fewer than 35 hours a week. Overall, most respondents (82.3%) received paid time off, and those working 35 hours a week or more were significantly more likely to receive this benefit than those working fewer than 35 hours a week (95.1% compared to 77.5%,  $p < 0.001$ ). We found similar trends for medical benefits, dental benefits with employer contribution, and retirement benefits with employer contribution.

### Current Duties

**Figure 6** shows the mean frequency scores based on DH survey respondent’s reporting of the frequency that they performed various job duties (from 0 [never performed] to 6 [performed every day]) and **Table 11** shows the percentage of respondents who said they performed the task or duty at all (from 1 [a few times a year or less] to 6 [every day]). DHs most frequently reported recording health histories and oral inspection and measuring of periodontal pockets, with no diagnosis, as shown by the high score of 5.9 indicating these duties are performed by DHs almost every day. Almost all respondents (99.1-99.6%) indicated they perform these duties at any frequency (**Table 11**). Among the duties performed nearly every day were applying topical fluoride/ varnish (mean of 5.7), taking intraoral and extraoral radiographs (mean of 5.4), and head and neck evaluation and oral cancer screening (mean of 5.4). Lower mean scores, such as for sealants, silver diamine fluoride, and placing and finishing restorations indicate that responding DHs reported performing these tasks less frequently (once a month or a few times a month, but less than weekly), or that a smaller percentage of responding DHs perform them at all. Nearly two-thirds said they have ever applied sealants (63.0%), while about half reported every applying silver diamine fluoride (52.9%) and a quarter had ever placed or finished restorations (25.5%).

**Figure 6. Mean Frequency that Dental Hygienist (DH) Survey Respondents Currently Working in Washington Perform Job Duties, N=839**



**Table 11. Clinical Tasks and Duties Performed by Dental Hygienist (DH) Survey Respondents Currently Working in Washington, N=839**

| Job Duties and Tasks  | DHs in WA who said they perform the task/duty at all* |
|---|---|
| Perform subgingival scaling   | 99.6%   |
| Oral inspection and measuring of periodontal pockets, with no diagnosis | 99.6%   |
| Apply topical fluoride/varnish (other than silver diamine fluoride)     | 99.2%   |
| Record health histories   | 99.1%   |
| Administer local anesthetic agents                                      | 99.1%   |
| Perform root planing  | 98.8%   |
| Take intraoral and extraoral radiographs                                | 96.7%   |
| Take and record blood pressure and vital signs                          | 95.7%   |
| Head and neck evaluation (oral cancer screening)                        | 95.5%   |
| Administer nitrous oxide analgesia                                      | 85.5%   |
| Perform soft-tissue curettage   | 78.2%   |
| Place sealants  | 63.0%   |
| Place antimicrobials  | 58.1%   |
| Apply silver diamine fluoride   | 52.9%   |
| Place and finish restorations   | 25.5%   |

\*Percentage of respondents who answered 1 (a few times a year or less) to 6 (every day). Note: Percent calculations do not include missing data, including respondents who answered, 'Not Applicable.' Missing values: subgingival scaling, 71 (8.5%); oral inspection, 77 (9.2%); topical fluoride, 71 (8.5%); health history, 75 (8.9%); root planing, 73 (8.7%); local anesthetic, 78 (9.3%); radiographs, 77 (9.2%); record vitals, 79 (9.4%); head and neck exam, 89 (10.6%); nitrous oxide, 101 (12.0%); perform curettage, 152 (18.1%); sealants, 114 (13.6%); antimicrobials, 120 (14.3%); silver diamine fluoride, 119 (14.2%); restorations, 149 (17.8%).

## Career and Job Experiences

As indicated in **Figures 7, 8, and 9**, nearly all respondents (98.7%) agreed or strongly agreed with the statement “My work improves the health of our patients” (**Figure 7**). Just over half of respondents (54.5%) agreed or strongly agreed that they “would recommend a career as a dental hygienist to a friend or relative”. About 5-6% of respondents did not answer these and subsequent questions.

When asked if they were “appropriately compensated for the work [they] do,” nearly two thirds (63.2%) of survey respondents agreed or strongly agreed (**Figure 8**). Less than half of respondents agreed with the statements “I am satisfied with opportunities for growth and leadership development opportunities at work” (43.1%) and “I am satisfied with opportunities for promotion at work” (40.2%).

A little more than a third of DH survey respondents (37.8%) agreed or strongly agreed with the statement that they felt “overwhelmed by the amount of work [they are] given”, and a similar percentage disagreed (36.6% strongly disagreed or disagreed) (**Figure 9**). Nearly all DH survey respondents agreed or strongly agreed that their “education prepared [them] for the technical skills” they need to perform their jobs (94.3%) and their “job duties and responsibilities are clearly defined” (94.0%).

DH survey respondents tended to disagree that they planned “to seek employment as a DH with another employer in the next 5 years” (61.3% disagreeing or strongly disagreeing and 17.3% neither agreeing nor disagreeing) (**Figure 8**).



**Figures 7-9. Levels of Agreement with Career and Job-Related Statements by Dental Hygienist Survey Respondents' Currently Working in Washington (N=839)**

Legend: Strongly Agree (Dark Purple), Agree (Light Purple), Neither Agree nor Disagree (Grey), Disagree (Light Orange), Strongly Disagree (Dark Orange)

Figure 7. Agreement with Statements About Job Meaning, Engagement, and Feelings of Being Professionally Valued

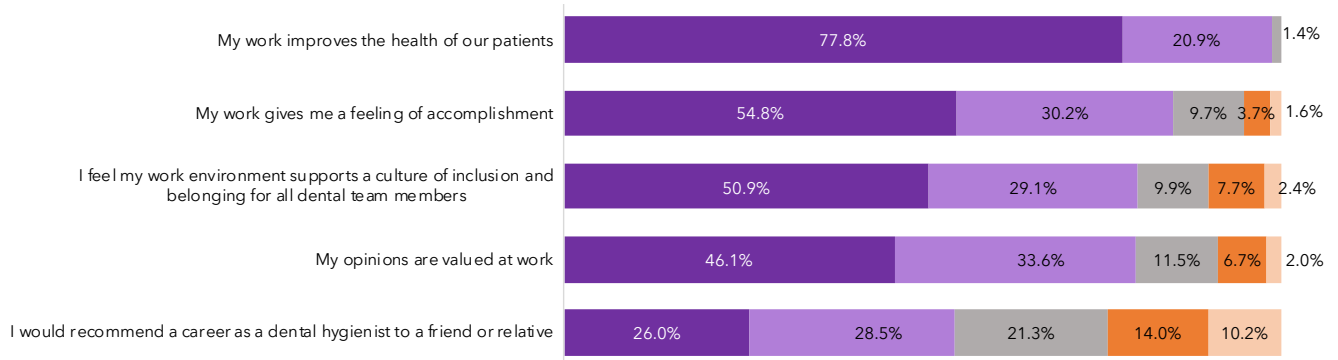


Figure 8. Agreement with Statements About Compensation and Opportunities for Job and Career Growth

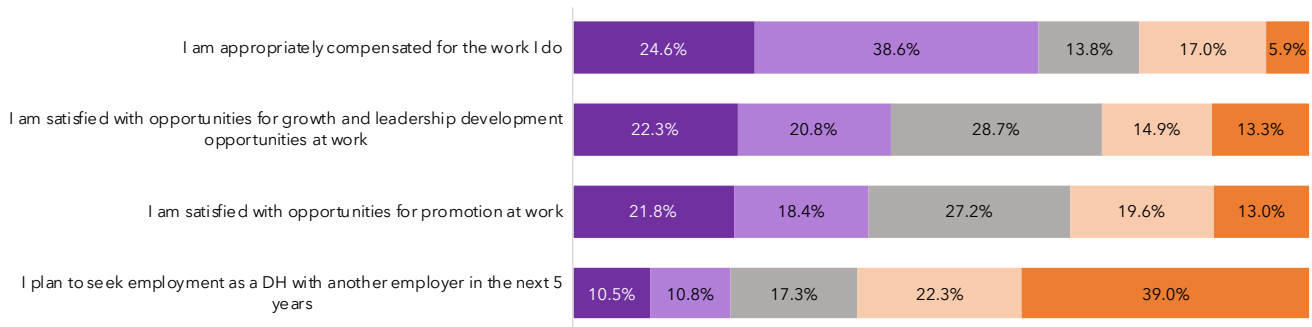
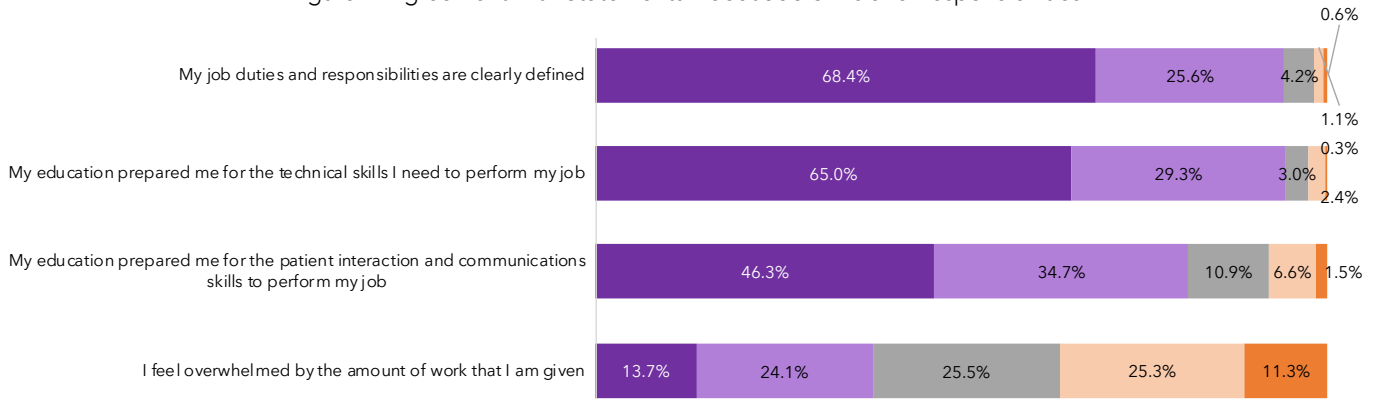


Figure 9. Agreement with Statements About Job Skills and Responsibilities



Note: Missing values, 'Don't Know' and 'Not Applicable' responses are not included in calculations. Missing data: Meaning, Engagement, Professional Value, 5.2-6.1%; Job Growth, 5.0-5.7%; Skills and Responsibilities, 5.5-5.6% of respondents were missing responses to these questions.

**Table 12. Job-related Pain of Dental Hygienist (DH) Survey Respondents Currently Working in Washington (WA)**

|   | DHs in WA<br>N=839 |
|---|--------------------|
| In the past 12 months, have you had pain or discomfort in your hands, wrists, arms, shoulders, or neck? |                    |
| Yes   | 89.3%              |
| No  | 10.8%              |
| <b>Among dental hygienists experiencing pain</b>  |                    |
| <b>n=706</b>  |                    |
| Over the past 3 months, how often did your pain limit your life or work activities?                     |                    |
| Never   | 27.7%              |
| Some days   | 56.1%              |
| Most days   | 9.8%               |
| Every day   | 6.0%               |
| Don't know  | 0.4%               |
| Do you attribute this pain or discomfort to dental hygiene work?  |                    |
| Yes   | 92.6%              |
| No  | 2.8%               |
| Not sure  | 4.6%               |

Note: Percent calculations do not include missing data. Pain limit and pain follow-up questions only asked of those who answered yes to having pain in the past twelve months. Missing data: pain in the past 12 months (48, 5.7%), pain limiting activities (3, 0.4%), and pain attributed to DH work (3, 0.4%).

DHs were asked to respond to a series of questions about whether they had recently experienced upper body pain, and its impact on, and likely origins from, their work (Table 12). A majority (89.3%) of respondents indicated they had “pain or discomfort in your hands, wrists, arms, shoulders, or neck in the past 12 months.” Nearly all (92.6%) of those experiencing pain in the past 12 months attributed this to their DH work and 71.9% of those with pain indicated that it limited their life or work activities in the past 3 months (either some days, most days, or every day). Of all responding DHs in our sample, 82.3% reported pain in the past 12 months and 68.3% reported limitations due to pain (data not tabled).

When asked to select one option from a list that “best describes your plans for your primary role over the next few years”, nearly three-quarters of respondents (72.5%) indicated they planned to continue working as a DH in clinical practice for the next five years and 14.2% planned to retire or otherwise leave dental practice (Table 13).

**Table 13. Future Plans of Dental Hygienist (DH) Survey Respondents Currently Working in Washington (WA), N=839**

|   | DHs in WA |
|---|-----------|
| Plans for primary role over the next few years  |           |
| Continue working as a dental hygienist in clinical practice   | 72.5%     |
| Retire or otherwise leave dental practice   | 14.2%     |
| Change my primary role from dental hygienist in clinical practice to a non-clinical role such as dental educator or administrator/manager | 5.7%      |
| Continue working in a non-clinical role, such as dental educator or administrator/manager   | 3.8%      |
| Begin an education program within the next 5 years that would allow me to advance to another dental occupation                            | 2.5%      |
| Transition to myofunctional therapist   | 0.6%      |
| Other   | 0.6%      |
| Move from non-clinical role to clinical dental hygiene practice   | 0.1%      |

Note: Percent calculations do not include missing data. Missing data: n=28, 3.3%.

## DISCUSSION

Results from this study provide an updated understanding of Washington State’s DH workforce based on a survey of DHs with Washington licenses. These findings provide insights into who selects dental hygiene as a career and their pathways into this important oral health occupation, descriptions of the types and locations of their work, as well as DHs’ experiences with and views of their jobs and careers.

We found that the survey responses provide a reasonable estimate of the characteristics of the overall state DH workforce. No significant differences were found for gender or geographic distribution between survey respondents compared with the overall licensed DH population, and while there was a statistically significant difference between the ages of survey respondents compared with the overall licensed DH population, the difference (46.4 vs. 44.6 years) may not be sufficiently meaningful to limit our interpretations of the representativeness of the findings.

### Who are DHs in Washington?

Survey findings suggest that about 84% of DHs with Washington licenses were practicing as a DH in the state. We found that the typical DH survey respondent working in Washington was female, in their 30s or 40s, and living in an urban area. Over three-quarters of respondents identified as white. Asian and Hispanic/Latino were the next most common races/ethnicities selected. The percentage of DH survey respondents in Washington who report being female (97.6%) is similar to the estimate from the national sample of DHs in the 2021 American Community Survey (ACS) (94.6%), and to a 2004 Washington state survey of DHs (96.4%).<sup>17</sup>

Washington’s DH survey respondents were slightly older, on average, than those in the 2021 national sample (ACS estimated average age of 42.5 years nationally compared to our survey’s 45.2 years), are slightly more diverse (83.4% white and 5.3% Asian from the national ACS compared to 78.0% white and 8.1% Asian in our Washington sample).<sup>18</sup>

### What are common career pathways of Washington’s DHs?

Survey responses indicate Washington’s DHs enter the profession through several routes, including associate (49.9%) and bachelor’s degrees (45.4%). About half of the responding DHs worked in another dental position before becoming a DH, frequently as a dental assistant (DA). Our recent survey of DAs in Washington found that 42% DAs intended to pursue education to advance to another career within five years.<sup>11</sup> Supporting these career advancement intentions should reinforce and potentially increase this existing pathway into DH careers.

About a quarter of DH survey respondents working in Washington completed their DH education in a state other than Washington. In 2023, the Washington State Legislature passed the Dentist and Dental Hygienist Compact, which is an “interstate agreement that provides a pathway through which dentists and dental hygienists can obtain authorization to practice in states where they are not licensed,” creating reciprocity among participating states.<sup>19,a</sup> The Dentist and Dental Hygienist Compact has not yet been implemented in Washington, but in the future it will be important to track measures such as state of DH education among the Washington’s DH workforce to help assess whether the Dentist and Dental Hygienist Compact increases supply by attracting DHs from other states.

<sup>a</sup>Participating states include: Colorado, Iowa, Kansas, Maine, Tennessee, Virginia, Washington, and Wisconsin. Legislation is pending in: Illinois, Minnesota, New Jersey, Ohio, and Pennsylvania. (Source: <https://ddhcompact.org/compact-map/>)

## What characterizes the work of DHs in Washington?

DH survey respondents most commonly worked in solo dental clinic settings, followed by group dental clinics, and most worked in settings that provide general practice dentistry. DH survey respondents in Washington reported a higher mean wage than reported in a national Bureau of Labor Statistics sample; \$59.80/hour among respondents compared with \$43.21 nationally in 2023.<sup>20</sup> Washington DHs working in public and non-profit settings, such as public health departments and FQHCs, worked more weekly hours on average than DHs in private practices, and earned lower hourly wages. DHs in public and non-profit settings and those that worked 35 hours a week or more (regardless of setting) reported receiving more employment benefits (including medical insurance, retirement, and paid time off) than DHs working in private settings and those that worked fewer than 35 hours a week (regardless of setting). Slightly less than half (46.6%) of DH respondents said they received dental benefits with employer contribution; this percentage was higher (66.7%) among those employed in public and non-profit settings.

From a list of job duties within Washington's DHs scope of practice, respondents' average frequency scores showed they performed most tasks "several times a week" to "every day". Less frequent tasks (once a week or less often, on average) were performing soft-tissue curettage, administering nitrous oxide analgesia, placing antimicrobials, applying sealants and sliver diamine fluoride, and placing and finishing restorations. One explanation for the lower frequency reported by DHs for applying sealants and fluorides is that these tasks can also be performed by dental assistants, which may be the preferred staffing assignment in many clinics.

## What are DHs' experiences and views about their jobs and career?

When asked about views of their jobs and careers, Washington's DH respondents were generally positive about the work they performed but indicated dissatisfaction with some aspects of their jobs. Notable positive responses included that nearly all strongly agreed or agreed with statements that their work improves the health of their patients, provides a feeling of accomplishment, and that their job duties and responsibilities were clearly defined, and their education prepared them for the technical job skills they needed. Fewer than a quarter of respondents indicated they planned to seek DH employment with another employer in the next five years. Somewhat negative responses of note were that less than half of respondents agreed with statements about being satisfied with opportunities for growth and leadership development and with opportunities for promotion. Just slightly more than half agreed that "I would recommend a career as a dental hygienist to a friend or relative." The percentage of DHs indicating they would recommend dental hygiene as a career is lower than reported by DAs about their careers in our recent survey (65% of DAs and 77% of EFDAs strongly agreed or agreed).<sup>11</sup>

Musculoskeletal disorders (MSDs) among dental professionals are well documented, including by a 2004 UW CHWS survey of Washington's DHs.<sup>21-23</sup> In that UW CHWS study, more than three out of four (78%) DHs in 2004 reported pain or discomfort in the hands, wrists, arms, shoulders, or neck in the past 12 months, and 92% of those attributed the discomfort/pain to their work as a DH. Nearly twenty years later, our 2024 survey found 89% of DH survey respondents experienced similar types of pain in the past year, with 93% attributing it to dental hygiene work and, of those, 16% reported that it limited their life or work activities most or every day. The risks of DH work appear to persist, in spite of many documented practices designed to reduce MSDs among dental workers, including equipment and practice modifications to improve work ergonomics as well as physical exercise.<sup>24-27</sup>

Despite some job dissatisfaction and MSDs among DH respondents, nearly three-quarters planned to continue working as a DH in clinical practice over the next few years and 14% expected to retire or otherwise leave dental practice. Given that about 18% of respondents were age 60 or older, the percentage planning to retire appears consistent with expected age-related retirement. Less than 3% of responding DHs planned to begin an education program allowing advancement to another dental occupation

## CONCLUSIONS

Demand for DHs in Washington state remains very high and job vacancies are limiting access to dental services in the state.<sup>4,28</sup> The findings from this survey provide some clues about actions that might increase the availability of DHs in the state. Limitations that stand out include the relatively short work weeks preferred by the current DH workforce, especially in private practices – with few indicating a desire to increase the number of hours they work per week. Of course, the high percentage of DHs experiencing MSDs could explain some of the desire to keep work weeks short. Improvements in the conditions and DH practices that contribute to MSDs could help to reduce vacancies for DHs and the resulting delays in patient care. These include expanding strategies to increase awareness and use of techniques and physical exercises that help prevent MSDs. In addition, employers who provide DHs with equipment such as hand tools and exam chairs designed to prevent or reduce the severity of MSDs could help limit absenteeism as well as improve their recruiting and retention success.

The pathway from dental assistant to DH is well-recognized and many dental assistants in our recent survey expressed interest in pursuing dental hygiene education – an interest that should be encouraged. Extending the DH career pathway with more opportunities for advancing dental hygiene careers including, but not exclusively, into dentistry, could make DH a career that attracts more diversity among entrants. The fact that DHs in Washington have remained nearly entirely female for decades suggests additional research is needed to better understand what limits the attractiveness of DH among men. While gender proportions of the current DH workforce do not reflect the overall state population, the racial and ethnic diversity of Washington’s DHs seems to be increasing and is becoming more reflective of statewide numbers. The 2004 survey estimated 93% of Washington’s DHs were white, and 78% reported being white in 2024, which approaches the 72.3% white among the state’s population in 2022.<sup>29</sup> If there is future success in improving the representativeness of the gender of DHs’ relative to the population, attention should be paid to ensuring the racial/ethnic representativeness is also maintained or improved.

Ongoing tracking of size, distribution, and characteristics of Washington’s dental workforce, including DHs, is important to determine if and where progress is achieved to address oral health workforce issues in the state. Resources such as those provided through the UW CHWS WOHW Tracking Program are an example of how state workforce monitoring can be achieved.

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The Washington Oral Health Workforce (WOHW) Tracking Program collects, analyzes, and disseminates relevant and objective information about Washington's oral health workforce. <https://familymedicine.uw.edu/chws/resources/wohw/> The WOHW Tracking Program Dashboard includes data on the types of oral health occupations in Washington, supply size and distribution, education and training, workforce demand, as well as reference information and news about oral health workforce policy and practice. This information can be used to guide practice and policy that will help ensure the state's population has access to needed oral health care.

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# APPENDIX A: QUESTIONNAIRE

Page 1

## Washington State Dental Hygienist Questionnaire

The University of Washington's Center for Health Workforce Studies is conducting an academic research study to better understand the current dental hygienist workforce in Washington. As a licensed dental hygienist, you have been invited to participate in this study. The study will take approximately 15 minutes to complete.

You will be asked about your experiences as a dental hygienist, including questions on your: current employment, work history, educational background, current duties, job satisfaction, and basic background and demographic questions.

Your participation in this study is completely voluntary. You may choose not to answer any question or item in the questionnaire. You may exit your browser at any time. By responding to the questions, you will have indicated your consent to participate in this survey.

### Section 1. Current Job Characteristics

Are you currently working as a dental hygienist (in a job that requires you to have a dental hygienist credential)?

- Yes - I am working as a dental hygienist in a clinical setting     Yes - I am working as a dental hygienist in a non-clinical setting (e.g., education, research, admin)     No - I am not working as a dental hygienist

If no, why are you not working as a dental hygienist?

- I am unemployed, and I am seeking work as a dental hygienist  
 I am unemployed, and seeking work, but not as a dental hygienist  
 I am working in another position in healthcare  
 I am working in another position not in healthcare  
 I have a disability that prevents me from working  
 I am retired  
 Other

Please explain:

---

What is your current employment status at your primary work location?

- Permanent employee  
 Temporary: employed through a staffing agency  
 Temporary: not employed through a staffing agency  
 Direct access hygienist (as authorized by RCW 18.29.056)  
 Other

Please explain:

---

Is your primary work location in Washington state?     Yes     No

What is the ZIP code (or town, if you don't know the ZIP code) of the primary work location where you are employed as a dental hygienist?

---

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Which state or territory is your primary work location located?

- Alabama     Alaska
- American Samoa     Arizona
- Arkansas     California
- Colorado     Connecticut
- Delaware     District of Columbia
- Florida     Georgia
- Guam     Hawaii     Idaho
- Illinois     Indiana     Iowa
- Kansas     Kentucky
- Louisiana     Maine
- Maryland     Massachusetts
- Michigan     Minnesota
- Mississippi     Missouri
- Montana     Nebraska
- Nevada     New Hampshire
- New Jersey     New Mexico
- New York     North Carolina
- North Dakota     Northern Mariana Islands
- Ohio     Oklahoma
- Oregon     Pennsylvania
- Puerto Rico     Rhode Island
- South Carolina     South Dakota
- Tennessee     Texas
- U.S. Virgin Islands     Utah
- Vermont     Virginia
- West Virginia     Wisconsin
- Wyoming

Do you have a secondary work location where you are employed as a dental hygienist?

- Yes     No

Is your secondary work location in Washington state?

- Yes     No

What is the ZIP code (or town, if you don't know the ZIP code) of the secondary work location where you are employed as a dental hygienist (if applicable)?

\_\_\_\_\_

Which state or territory is your secondary work location located?

- Alabama  Alaska
- American Samoa  Arizona
- Arkansas  California
- Colorado  Connecticut
- Delaware  District of Columbia
- Florida  Georgia
- Guam  Hawaii  Idaho
- Illinois  Indiana  Iowa
- Kansas  Kentucky
- Louisiana  Maine
- Maryland  Massachusetts
- Michigan  Minnesota
- Mississippi  Missouri
- Montana  Nebraska
- Nevada  New Hampshire
- New Jersey  New Mexico
- New York  North Carolina
- North Dakota  Northern Mariana Islands
- Ohio  Oklahoma
- Oregon  Pennsylvania
- Puerto Rico  Rhode Island
- South Carolina  South Dakota
- Tennessee  Texas
- U.S. Virgin Islands  Utah
- Vermont  Virginia
- West Virginia  Wisconsin
- Wyoming

Do you work as a dental hygienist in three or more locations?

- Yes  No

During a typical work week, about how many total hours do you spend working as a dental hygienist in your primary work location?

\_\_\_\_\_ hours per week

During a typical work week, about how many total hours do you spend working as a dental hygienist in all work locations combined?

\_\_\_\_\_ hours per week

Which statement best reflects your preference regarding the number of hours per week you work as a dental hygienist:

- I would like to work fewer hours per week
- The number of hours I work per week is about right
- I would like to work more hours per week

Select the main dental focus of your primary work location:

- General practice
- Specialty/referral (e.g., perio, restorative, pediatrics)
- Both general practice and specialty/referral
- Other (not general practice or specialty/referral)

Specify the other dental focus:

\_\_\_\_\_

Which of the following best describes the facility type of the primary location where you work/provide care?

- Solo practice dental clinic
- Dental Service Organization (DSO)
- Group dental clinic (not a DSO)
- Federally Qualified Health Center (FQHC) or other Non-profit Community Clinic (with care provided free or on a sliding fee scale)
- Government facility (such as VA, IHS, Military, or Public Health)
- Direct Access Hygienist (as authorized by RCW 18.29.056; i.e., school-based setting, nursing homes, senior centers)
- Education/research
- Other

In what type of facility(ies) do you typically provide care as a Direct Access Hygienist: (e.g., nursing home, correctional facility, school) \_\_\_\_\_

Specify in what type of facility you typically provide care:

\_\_\_\_\_

About how many dentists practice at your primary work location?  0  1  2-5  6-10  More than 10

What is your best estimate of your current hourly rate of pay as a dental hygienist at your primary work location (not including overtime pay)? (Example: XX.XX)

\_\_\_\_\_ \$ per hour

Are you compensated for working overtime (work past set hours) at your primary work location?

- Yes, I receive overtime when I work past set hours
- No, I do not receive overtime when I work past set hours
- Not applicable, I do not work past set hours

Do you receive any of the following benefits with your employment at your primary work location? (check all that apply)

- Paid time off (e.g., sick leave and/or vacation)
- Medical benefits (e.g., health insurance) - no employer contribution
- Medical benefits (e.g., health insurance) - with employer contribution
- Dental benefits - no employer contribution
- Dental benefits - with employer contribution
- Retirement benefits - no employer contribution
- Retirement benefits - with employer contribution
- Paid continuing education
- Bonuses
- Supplies (e.g., scrubs, PPE)
- Other benefits
- None

Specify other benefits received: \_\_\_\_\_

**Section 2. Work History**

How many total years have you practiced as a dental hygienist in Washington? \_\_\_\_\_

How many total years have you practiced as a dental hygienist? (Include time in both WA and elsewhere) \_\_\_\_\_

Before becoming a dental hygienist, did you work in any other positions in a dental practice?  Yes  No

Which position(s)? (check all that apply)

- Dental assistant
- Expanded Function Dental Auxiliary (EFDA)
- Administration (e.g., front office, billing)
- Other

If you worked in other positions, specify: \_\_\_\_\_

Which of the following best describes your plans for your primary role over the next few years:

- Continue working as a dental hygienist in clinical practice
- Continue working in a non-clinical role, such as dental educator or administrator/manager
- Change my primary role from dental hygienist in clinical practice to a non-clinical role such as dental educator or administrator/manager
- Move from non-clinical role to clinical dental hygiene practice
- Begin an education program within the next 5 years that would allow me to advance to another dental occupation
- Retire or otherwise leave dental practice
- Other

Describe your other plans for your primary role: \_\_\_\_\_

| <b>Section 3. Current Duties</b>  |                       |                       |                       |                       |                       |                            |                       |                       |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------------------|-----------------------|-----------------------|
| <b>In your primary practice location, how often do you perform the following?</b> |                       |                       |                       |                       |                       |                            |                       |                       |
|   | Every day             | A few times a week    | Once a week           | A few times a month   | Once a month or less  | A few times a year or less | Never                 | Not applicable        |
| Head and neck evaluation (oral cancer screening)                                  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/> | <input type="radio"/> |
| Oral inspection and measuring of periodontal pockets, with no diagnosis           | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/> | <input type="radio"/> |
| Record health histories   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/> | <input type="radio"/> |
| Take and record blood pressure and vital signs                                    | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/> | <input type="radio"/> |
| Take intraoral and extraoral radiographs  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/> | <input type="radio"/> |
| Perform subgingival scaling   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/> | <input type="radio"/> |
| Perform root planing  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/> | <input type="radio"/> |
| Perform soft-tissue curettage   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/> | <input type="radio"/> |
| Administer local anesthetic agents  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/> | <input type="radio"/> |
| Place and finish restorations   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/> | <input type="radio"/> |
| Administer nitrous oxide analgesia  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/> | <input type="radio"/> |
| Place antimicrobials  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/> | <input type="radio"/> |
| Silver Diamine Fluoride   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/> | <input type="radio"/> |
| Topical fluoride/varnish (other than Silver Diamine Fluoride)                     | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/> | <input type="radio"/> |
| Sealants  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/> | <input type="radio"/> |

**Section 4. Job Experiences**

**Rate your level of agreement with the following statements about your work as a dental hygienist.**

|   | Strongly agree        | Agree                 | Neither agree nor disagree | Disagree              | Strongly disagree     | Don't know/Not applicable |
|---|-----------------------|-----------------------|----------------------------|-----------------------|-----------------------|---------------------------|
| My job duties and responsibilities are clearly defined  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>     |
| My work gives me a feeling of accomplishment  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>     |
| My opinions and input are valued at work  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>     |
| I am satisfied with opportunities for promotion at work   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>     |
| I am satisfied with opportunities for growth and leadership development opportunities at work           | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>     |
| My work improves the health of our patients   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>     |
| I feel my work environment supports a culture of inclusion and belonging for all dental team members    | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>     |
| I feel overwhelmed by the amount of work that I am given  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>     |
| I plan to seek employment as a dental hygienist with another employer in the next 1-3 years             | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>     |
| My education prepared me for the technical skills I need to perform my job                              | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>     |
| My education prepared me for the patient interaction and communications skills I need to perform my job | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>     |
| I am appropriately compensated for the work I do  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>     |
| I would recommend a career as a dental hygienist to a friend or relative                                | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>     |

In the past 12 months, have you had pain or discomfort in your hands, wrists, arms, shoulders, or neck? (Discomfort can mean pain, burning, stiffness, numbness, or tingling.)  Yes  No

---

Over the past 3 months, how often did your pain limit your life or work activities?

- Never
- Some days
- Most days
- Every day
- Don't know

---

Do you attribute this pain or discomfort to dental hygiene work?

- Yes
- No
- Not sure



**Section 5. Education/Training and Credentials**

Which of the following dental hygienist educational/training programs have you completed? (check all that apply)

- Associate degree    Bachelor's degree    Post-baccalaureate/graduate (Master's or Doctoral)  
 Other

Specify other dental hygienist educational/training programs completed: \_\_\_\_\_

Where did you complete your initial education/training that qualified you to become a dental hygienist?

- Washington State    Another US state or territory    Outside the US

Which state or territory?

- Alabama     Alaska
- American Samoa     Arizona
- Arkansas     California
- Colorado     Connecticut
- Delaware     District of Columbia
- Florida     Georgia
- Guam     Hawaii     Idaho
- Illinois     Indiana     Iowa
- Kansas     Kentucky
- Louisiana     Maine
- Maryland     Massachusetts
- Michigan     Minnesota
- Mississippi     Missouri
- Montana     Nebraska
- Nevada     New Hampshire
- New Jersey     New Mexico
- New York     North Carolina
- North Dakota     Northern Mariana Islands
- Ohio     Oklahoma
- Oregon     Pennsylvania
- Puerto Rico     Rhode Island
- South Carolina     South Dakota
- Tennessee     Texas
- U.S. Virgin Islands     Utah
- Vermont     Virginia
- West Virginia     Wisconsin
- Wyoming

What year did you complete your initial education or training to become a dental hygienist? \_\_\_\_\_

Which of the following other degree programs (not in dental hygiene) have you completed? (check all that apply)

- N/A - I have not completed any other degree programs     Associate degree     Bachelor's degree
- Post-baccalaureate/graduate (Master's or Doctoral)     Other

Specify other (not in dental hygiene) educational/training programs completed: \_\_\_\_\_

Are you registered, certified, or licensed as a dental hygienist in a state other than Washington?

- Yes     No

Which other state or territory?

- Alabama
- Alaska
- American Samoa
- Arizona
- Arkansas
- California
- Colorado
- Connecticut
- Delaware
- District of Columbia
- Florida
- Georgia
- Guam
- Hawaii
- Idaho
- Illinois
- Indiana
- Iowa
- Kansas
- Kentucky
- Louisiana
- Maine
- Maryland
- Massachusetts
- Michigan
- Minnesota
- Mississippi
- Missouri
- Montana
- Nebraska
- Nevada
- New Hampshire
- New Jersey
- New Mexico
- New York
- North Carolina
- North Dakota
- Northern Mariana Islands
- Ohio
- Oklahoma
- Oregon
- Pennsylvania
- Puerto Rico
- Rhode Island
- South Carolina
- South Dakota
- Tennessee
- Texas
- U.S. Virgin Islands
- Utah
- Vermont
- Virginia
- West Virginia
- Wisconsin
- Wyoming

**Section 6. Demographics**

What is your age?

---

What is your gender?

- Female  Male  Non-binary, I use a different term (specify below)

Please specify gender:

---

What is your race and/or ethnicity? (select all that apply)

- American Indian or Alaska Native  Asian  Black or African American  Hispanic or Latino origin  
 Arab, Middle Eastern, or North African  Native Hawaiian or Other Pacific Islander  White or of European descent  Other race or ethnicity

You selected American Indian or Alaska Native, please enter the name of enrolled or principal tribe.

---

You selected Asian, please specify (check all that apply):

- Asian Indian  Cambodian  
 Chinese  Filipino  
 Japanese  Korean  
 Malaysian  Pakistani  
 Vietnamese  Other

You selected Other Asian, please specify:

---

You selected Black or African American, please specify (check all that apply):

- Black  African  African American  
 African Caribbean  Other

You selected Other Black or African American, please specify:

---

You selected Hispanic or Latino origin, please specify (check all that apply):

- Cuban  Mexican/ Mexican American/ Chicano/ Chicana  Puerto Rican  
 South or Central American  
 Other Spanish Culture or Origin

You selected Other Spanish Culture or Origin, please specify:

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You selected Native Hawaiian or Other Pacific Islander, please specify (check all that apply):

- Guamanian or Chamorro  
 Native Hawaiian  Samoan  
 Other

You selected Other Pacific Islander, please specify:

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You selected Other race or ethnicity, please specify:

---

What is your home ZIP code?

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How many adults (including yourself) are there in your household? \_\_\_\_\_

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How many children (17 years of age and younger) are there in your household? \_\_\_\_\_

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What is your estimated annual household income (your income combined with other adults in your household)?

- Less than \$20,000     \$20,000 to \$34,999
- \$35,000 to \$49,999     \$50,000 to \$74,999
- \$75,000 to \$99,999
- \$100,000 to 149,999
- \$150,000 or \$199,999
- \$200,000 or more

# APPENDIX B: WASHINGTON DENTAL HYGIENISTS SURVEY - ESTIMATING POTENTIAL RESPONSE BIAS

Appendix B. Table 1. Estimating Potential Response Bias

|  | Survey Data | Licensure Data | P-value <sup>a</sup>      |
|--|-------------|----------------|---------------------------|
| <b>Gender, (%)</b>                           |             |                |                           |
| Male   | 4.0%        | 2.5%           | Not significant at p<0.05 |
| Female                                       | 96.0%       | 97.5%          |                           |
| <b>Age</b>                                   |             |                |                           |
| Mean   | 46.4 years  | 44.6 years     | <b>&lt;0.001</b>          |
| <b>Age category, (%)</b>                     |             |                |                           |
| <25 years                                    | 1.0%        | 2.1%           | Not significant at p<0.05 |
| 25-29 years                                  | 6.7%        | 9.0%           |                           |
| 30-34 years                                  | 13.8%       | 14.8%          |                           |
| 35-39 years                                  | 12.0%       | 15.0%          |                           |
| 40-44 years                                  | 13.7%       | 13.7%          |                           |
| 45-49 years                                  | 13.3%       | 10.4%          |                           |
| 50-54 years                                  | 10.7%       | 10.0%          |                           |
| 55-59 years                                  | 10.9%       | 9.4%           |                           |
| 60-64 years                                  | 8.8%        | 8.0%           |                           |
| 65+ years                                    | 9.3%        | 7.5%           |                           |
| <b>Geography, (%)</b>                        |             |                |                           |
| <i>Eastern WA vs. Western WA</i>             |             |                |                           |
| Eastern WA                                   | 24.7%       | 23.8%          | Not significant at p<0.05 |
| Western WA                                   | 75.3%       | 76.2%          |                           |
| <b>Accountable Community of Health (ACH)</b> |             |                |                           |
| North Sound ACH                              | 15.1%       | 19.2%          | Not significant at p<0.05 |
| Healthier Here                               | 29.9%       | 25.1%          |                           |
| Elevate Health                               | 10.1%       | 11.4%          |                           |
| Olympic Community of Health                  | 6.1%        | 4.7%           |                           |
| CHOICE                                       | 7.5%        | 7.5%           |                           |
| Southwest WA ACH                             | 6.6%        | 8.3%           |                           |
| Thriving Together                            | 3.7%        | 3.5%           |                           |
| Greater Health Now                           | 11.0%       | 10.6%          |                           |
| Better Health Together                       | 10.0%       | 9.7%           |                           |

<sup>a</sup> P-value determined by a two-sample t-test of means or Pearson chi-squared tests.  
 Note: 37 (3.7%) missing from survey respondents, unable to determine county.