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The Hispanic and Latino Dentist Workforce in the United State

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Abstract

Objectives—The purpose of this paper is to describe the Hispanic/Latino (H/L) dentist workforce, their general practice patterns, and their contributions to oral health care for H/L and underserved patients.

Methods—A national sample survey of underrepresented minority dentists was conducted in 2012 and received a 35.4% response rate for self-reported H/L dentists. Data were weighted for selection and response bias to be nationally representative. A workforce profile of H/L dentists was created using descriptive and multivariable statistics and published data.

Results—Among all H/L dentists (weighted $n=5,748$), 31.9% self-identify their origin as Mexican, 13.4% as Puerto Rican, 13.0% as Cuban, and 41.7% as another H/L group. The largest share of H/L dentists are male, married, and have children under age 18. Fifty percent of H/L dentists are foreign-born and 25% are foreign-trained. H/L dentists report higher than average educational debt, with those completing International Dentist Programs reporting the highest debt load. Sixty-nine percent of clinically active H/L dentists own their own practices, and 85% speak Spanish in their practice. Among clinical H/L dentists, 7% work in safety-net settings, 40% primarily treat underserved populations, and, on average, 42% of their patient population is H/L.

Conclusions—H/L dental providers are drastically underrepresented in the dentist population, and those that are in practice shoulder a disproportionate share of dental care for minority and underserved communities. Improving the workforce diversity of dental providers is a critical part of strategy to address the unacceptably high burden of dental disease in the H/L population.

Keywords

Dentists' Practice Patterns; Hispanic/Latino; Survey Research; Health Workforce

INTRODUCTION

The Hispanic and Latino (H/L) population makes up 16% of the United States (U.S.) and is the fastest growing segment of the population. The 2010 Census attributed 91.7% of the

nation's growth since 2000 to racial and ethnic minorities, and 56% of this was due to the growth in the H/L population (1). At the same time, H/L dentists are significantly underrepresented in the dental workforce. The Surgeon General and Institute of Medicine have noted that increasing the number of minority dentists would be an avenue to improving cultural competency and access to care while decreasing health disparities in oral health (2–5). This is supported by research on racial concordance showing improved health outcomes in concordant provider-patient relationships (6–8). Increasing the H/L dental workforce will not resolve oral health disparities in the H/L population, but is a critical component of any strategy to address these issues.

Disparities in access to care and oral health outcomes have been well documented for the H/L population of the U.S. Compared with non-Hispanic Whites, H/L children are twice as likely to have untreated tooth decay and receive fewer preventive care services (9). This pattern extends to H/L adults -- for example, 44.1% of Mexican origin adults age 45–64 in 2011–2012 have reported untreated caries compared to only 22.1% of non-Hispanic Whites (10). A 1996 study on professionally active dentists reported some basic information on H/L dentists' practice characteristics and concluded that the race of the practitioner seemed to impact the race of the patients seeking care from them (11). A 2007 study that explored the supply of H/L dentists in California by analyzing the California dentist license file found that H/L dentists were twice as likely to serve in high Latino ZIP codes as non-Latino dentists. As well, this study found a severe underrepresentation of H/L dentists in relation to the growing H/L population, and, after examining the dental school pipeline for H/L dentists, concluded that this disparity was likely to increase (12). This study enhances the understanding of the H/L dental workforce in the U.S. by examining personal characteristics, professional trajectory, patient demographics, and contribution to care for minority and other underserved populations.

METHODS

Study data were collected in a national sample survey of underrepresented minority (URM) dentists conducted in 2012–2013 under IRB-approved study number 11–07905 at the University of California, San Francisco (13). The available study resources allowed for neither a census of all H/L dentists nor the inclusion of a non-URM dentists. The sample was derived from the American Dental Association (ADA) masterfile which identified a total of 12,983 URM dentists with active licenses in the U.S., among which 5,926 were classified as H/L. The final sample (36.7%, n=2,173) was stratified by Rural-Urban Commuting Areas, with censuses of all 98 rural dentists and all 439 suburban dentists, and a sample of 1,636 urban dentists. During the survey process, 229 H/L dentists were removed as ineligible, leaving a universe of 1,944 H/L dentists. A total of 688 of the 1,944 eligible dentists originally identified as H/L responded for a final response rate of 35.4% (Table 1).

Survey respondents were able to identify as more than one racial or ethnic category. Hispanic or Latino identity was derived from respondent choices to the Office of Management and Budget (OMB) Hispanic sub-categories (14). Supplementary Table 1a online details the racial/ethnic composition of H/L dentists. For analytic purposes, we assigned a primary race to each respondent based on detailed examination of individuals

who identified as more than one category of URM dentist, including analysis of self-identified race/ethnicity, location where they grew up, organized dentistry affiliations, languages spoken, tribal affiliations or blood quantum data, and work history. This process resulted in 19 individuals moving from their original sampling frame (AI/AN or Black) in the ADA masterfile to a primary classification as H/L in our data set, and 15 respondents sampled as H/L moving to either AI/AN or Black in our data, bringing the total number of H/L respondents to 692. Selection likelihood and correctible, measureable response bias were adjusted for using base and poststratification weights applied to the 692 respondents based on their original sampling frames, for a weighted total of 5,784 H/L dentists in the U.S., 142 fewer than were identified in the original ADA masterfile (13). To allow for further analysis, population data from the U.S. Census was linked to the mailing address for survey respondents (15). Descriptive and multivariable statistics were restricted to the H/L survey responses and all data presented are weighted. The comprehensive survey methodology, response rate, and response quality have been previously reported producing a data set that is reasonably representative of the URM dentist population (13). Standard errors of population estimates are not presented, but sampling error in this study is likely small given that the sample design included a census of rural and suburban H/L dentists (no sampling error), along with a large sampling (1,636 dentists) and large proportional sampling (30.4%) of urban H/L dentists. The large sample size and finite population correction would likely result in small standard errors of population estimates for the suburban segment of the H/L dentist population.

RESULTS

Hispanic/Latino Dentists' Demographic Characteristics

Across the four OMB Hispanic sub-categories, H/L dentists self-identified as a) Mexican, Mexican American, or Chicano/a (31.9%, n=1,847), b) Another Hispanic, Latino/a, Spanish race or ethnicity (41.7%, n=2,410), c) Puerto Rican (13.4%, n=774), and d) Cuban (13.0%, n=753). *Detailed demographic characteristics of all URM dentists are provided in Supplementary Table 2 online.* Among all H/L dentists, 85% (n=4,514) speak a language other than English in clinical care, and 99.4% of them reported this language as Spanish.

The largest share of all H/L dentists are age 45–54 (38.5%), male (63.1%), married or in domestic partnerships (77.0%), and have children under age 18 (51.3%). Fifty percent of H/L dentists were born in the U.S.; however, this varied from one-quarter of Puerto Rican dentists to 77% of dentists of Mexican heritage. The largest share of H/L dentists (44.3%) were raised in a large city, followed by 33.8% who were raised in a medium-sized city or in the suburbs. There is some variance in location raised by H/L sub-category; only 24.2% of Puerto Rican dentists were raised in a large city compared to 55.9% of Cuban dentists.

Among H/L dentists, 36.8% (n=881) were the first in their family to graduate from college. Close to half of all H/L dentists' parents' highest education (53.5% of mothers and 43.0% of fathers) was a high school degree or less. Compared to dentists age 49 or older, dentists under 49 are more likely to have a parent (59.3% vs. 34.0% for mothers and 67.9% vs 46.3% for fathers) reach college or higher, indicating that younger H/L dentists are coming from

more highly educated families than are older dentists. *Detailed parental education tables for all URM dentists are provided in Supplementary Tables 3 and 4 online.*

Hispanic/Latino Dentists' Education, Licensure, and Professional Membership

Three pathways to practice were discernable among H/L dentists: 1. Initial degree at a Commission on Dental Accreditation (CODA)-accredited dental school (U.S.-trained), 2. Foreign-trained initially followed by graduation from a CODA-accredited school (International Dentist Program, or IDP), and 3. Foreign-trained. Any pathway can be augmented with a residency completion. Three-quarters (n=4,163) of H/L dentists received their initial dental degree at a CODA-accredited dental school, and 43.0% of these individuals (n=1,792) completed a residency (Table 2). Among the 1,404 H/L dentists who attained their initial dental degree at a foreign dental school, 36.2% (n=508) subsequently received a dental degree at a CODA-accredited school and 53.8% (n=755) completed a residency. Altogether, 83.9% (n=4,671) of H/L dentists completed training at a CODA-accredited school during the course of their dental education.

Almost all H/L dentists born in the U.S. were U.S.-trained (95.7%) compared to 53.1% of those born outside of the U.S. Among U.S.-trained H/L dentists, 63.3% attended a public dental school (n=2,688), but among foreign-trained dentists who subsequently completed an IDP, 70.0% attended at a private school (n=363). These data indicate that foreign-trained H/L dentists who complete an IDP choose private schools at nearly the same rate at which U.S.-trained H/L dentists choose public schools for their dental education.

Forty-six percent (n=2,568) of all H/L dentists reported completing a dental residency, including 21 H/L respondents who did not provide information on their pathway to the residency. Among H/L dentists who completed a residency, 57.6% (n=1,478) completed an Advanced Education in General Dentistry or General Practice Residency, followed by 37.6% (n=965) who completed a specialty residency and 4.9% (n=125) who completed both. H/L dentists born in the U.S. were less likely than those foreign-born (47.3% vs 60.8%) to complete any residency.

The average educational debt of all H/L dentists upon graduation was \$140,200 in 2012 dollars, and 15.8% (n=916) reported graduating with no dental school debt. Average debt level varied greatly with dentists' pathways to practice (Table 4). Over the 15-year period from 1996–2010, the average of the annual average debt of all students as reported by the American Dental Education Association (ADEA) in 2012 dollars (\$147,871) is consistently lower than the average of the annual average debt reported by H/L dentists (\$195,127) over the same period (16). The highest debt burden and highest debt differential during this timeframe is among those who attended private CODA-accredited schools: \$183,578 for all graduates in ADEA's report vs. \$264,967 for H/L respondents in the URM survey.

Overall, 42.7% (n=2,450) of H/L dentists indicated that their educational debt had no impact on their practice choice after graduation; however, this too varied by the pathway to practice. Three-quarters of dentists who were exclusively foreign-trained reported that debt had "no impact" on practice choice compared 37% of those who ever trained at a CODA-accredited school, indicating that educational debt is a greater burden for those who trained in the U.S.

The most commonly cited impacts of debt (from among 11 choices) for H/L dentists who attended a CODA-accredited school were not being able to afford to start a practice (27.3%) or to buy a practice (20.3%) and accepting a position as an associate (24.7%) or as an employee (18.3%).

Across all H/L dentists, the majority (78.6%, n=4,504) hold active licenses in just one state. Almost 60% of H/L dentists are members of the ADA (n=3,466), and 14.1% (n=813) reported membership in the Hispanic Dental Association (HDA). Twenty-two percent (n=1,309) reported no membership in any organized dental association.

Hispanic/Latino Dentists' Career Trajectory

Among all H/L dentists 96.6% (n=5588) reported being professionally active and of these, 95.6% (n=5,342) are clinically active. Just 3.4% (n=196) reported not working in the dental field. Reasons provided included retirement (35%), child care duties (20%), disability (16%), and leaving the dental field (11%). Among these dentists, 46% indicated that they are likely or highly like to return to dental practice.

All H/L dentists were asked to provide information on their initial employment location with the exception of those currently enrolled in a residency (n=4), and professionally active dentists were asked about their current primary and secondary practices. Table 3 classifies specific practice types and provides a breakdown of initial and current practice settings. Female H/L dentists are more likely than their male colleagues to be working in safety-net (8.5% vs. 5.8%), corporate (6.4% vs 3.4%) and educational settings (5.4% vs 2.6%).

To gain a deeper understanding of career trajectory, we mapped the practice progression of professionally active H/L dentists from their first position to their current primary practice (Table 4). Dentists working in industry were excluded due to their small numbers. Among H/L dentists respondents who provided both an initial and current practice location, 76.3% (n=3,627) began their careers in traditional practice settings, with 92.0% of these dentists (n=3,337) remaining in a traditional setting in their current primary position. In contrast, retention for those who started in corporate settings was 37.3%; educational settings was 41.9%; safety-net settings was 46.2%; and public settings was 47.2%. The most common practice type for these dentists to move into was a traditional setting.

Those who began in safety-net and public settings had the highest rates of having participated in a Community-based Experience (CBE) "often" or "sometimes" during dental school. In every category of initial setting, those who stayed in or moved to traditional settings had the lowest rates of participation in CBE. Although the link is observational, the data lends credence to the theory that CBE increases dentist willingness to work in alternative settings.

Most H/L dentists reported being a general practitioner (73.4%, n=4,102) in their primary practice area, and 30.5% (n=1,705) indicated that they are board certified in their area of practice (specialty or general practice). Additional areas of clinical focus were reported by 3,465 (62.0%) providers and included: cosmetic dentistry (67.5%), implantology (47.5%), orthodontics (27.6%), geriatrics (20.5%), anesthesia (14.1%), special care (14.1%), and

hospital dentistry (4.8%). The majority (66.2%, n=3,695) of H/L dentists intend to practice for an additional 10 years or longer.

Hispanic/Latino Dentists in Clinical Practice

Among clinically active H/L dentists, 69% (n=3,695) own their own practices. The majority of practice owners (53.2%, n=3,578) report having built their own new practices, followed by 32.7% (n=1,210) who purchased an existing practice and 10.9% (n=401) who purchased part of an existing practice. The average H/L dentist's clinical setting has 2 dentists, 2 registered dental hygienists, and 2 operatories.

H/L dentists reported an average work week of 40.1 hours, 32 of which were in clinical care. H/L dentists treated an average of 59 scheduled and 9 walk-in patients per week, with little difference across settings. Averaged across all settings, the largest share of H/L dentists reported providing care to all who request appointments but not being overworked (43.5%, n=2,323), while 28.2% reported being not busy enough. However, among those in safety-net settings, 74.2% (n=242) reported being overworked or too busy to treat all who requested care, as did 90.3% (n=91) of dentists in public health or government settings. These results indicate that dentists' level of busy-ness varies by practice setting, with those in traditional practice being less busy than those in safety-net, public health, or government settings.

Almost 71% (n=3,767) of clinical H/L dentists reported whether or not they collaborate with expanded function dental assistants, hygienists, or therapists. Of these, 70.9% (n=2,669) are practicing in a state that allows employment of expanded function staff. In states where expanded function staff are allowed, H/L dentists are closely divided between those who work with these staff (47.6%, n=1,270) and those who don't (52.4%, n=1,399). Dentists in traditional and public health/government settings were least likely to work with expanded function staff (45.0% and 32.0%, respectively), while those in safety-net and education settings were most likely to work with expanded function staff (61.0% and 60.6%, respectively).

The average annual income of H/L dentists in 2011 was \$170,761, but varies by practice setting from \$179,850 for those in traditional settings to \$106,126 for those in education. Earnings also vary by gender, with male H/L dentists averaging \$186,716 and female H/L dentists averaging \$143,163. The male-female differential varies by age cohort with average differences of \$30,599 for the 35–44 age group, \$68,460 for the 45–54 age group, and \$34,412 for the 55–64 age cohort. The ADA reports that in 2014 the net income of all dentists in private practice averaged \$170,000.(17)

Hispanic/Latino Dentists' Patient Characteristics

Forty-four percent (n=2,152) of clinically active H/L dentists report that they primarily treat underserved patients at their primary practice, and an additional 4.8% (n=259) report having a secondary practice at which they primarily treat underserved patients. Table 5 describes the medical conditions of H/L dentist's patients, among whom close to one quarter are reported to have diabetes and one third to have hypertension, numbers slightly higher than US population average rates of these conditions (18, 19).

H/L dentists reported on average that the largest share of their patients is H/L (41.8%), and that they serve higher percentages of all minority patients (58.7%) in their practices than are found in the U.S. general population (Table 6). Additionally, 24.4% (n=1,162) of clinical H/L dentists reported treating children under the age of 1, 68.0% (n=3,232) reported treating children under the age of 5, and 68.1% (n=3,241) reported treating patients over 85. On average, 52.2% of H/L dentists' patients are covered by private insurance, and 58.3% of H/L dentists accepted any publicly insured patients. H/L dentists in traditional practice report on average 23.7% of their patients are on public insurance, almost 4 times the 6.1% of patients among all private practice dentists in 2012 reported to be publicly insured.⁽²⁰⁾ Almost three-quarters of H/L dentists (n=3,612) reported discounting or waiving fees for patients who are either uninsured or unable to pay. Fifty-four percent of these dentists provided an estimated value of the care they provided at a discount or for free in 2011, which averaged \$45,498. H/L dentists report a wide range of patient population characteristics but are clearly an important access point for minority and publicly insured populations.

Professional Collaboration, Technology Use & Volunteerism

The field of dentistry is constantly growing and evolving to include more use of technology and be better integrated with other types of healthcare professionals. The survey asked to what extent dentists collaborated with other dentists and seven types of other health care providers (doctors, nurses, pharmacists, etc.). Among clinical H/L dentists, those in traditional (64.1%) and corporate settings (91.5%) reported collaborating "often" or "sometimes" with between one and three types of practitioners, whereas the majority of those in safety-net (53.8%), public health/government (59.0%) and education (64.7%) settings reported collaborating with four or more types of practitioners. H/L dentists in traditional settings were most likely to collaborate with no other health professionals (20.2%), which is more than twice as high as those in any other setting.

H/L dentists were asked about the current use or intention to use 15 different information technology tools in their dental practice. Among the technologies were three specific to treating vulnerable populations: teledentistry tools, phone translation services, and mobile dental equipment. Well over half of dentists in traditional (78.9%), corporate (92.3%), and safety-net (64.0%) settings used none or only one of these technologies, while the majority of dentists in public health/government (53.2%) or education settings (55.6%) used two or more of these technologies. Online Supplementary Tables 5 and 6 provide details on URM dentists' clinical collaboration and technology.

Dentists are often asked to volunteer their services, and among all H/L dentists currently working in the dental field (including those working in non-clinical settings), 47.3% (n=2,735) reported volunteering any time as a dentist outside of their own office. Of dentists who volunteer, most (53.3%) do so less than 3 days a year: 30.8% reported volunteering between 3–11 days per year, 12.0% reported volunteering 1 day per month, and 3.8% report volunteering two days per month or more in an average year. Just under half (44.9%) of H/L dentists reported where they volunteer, and the most common volunteer location was at organized community events (59.3%, n=1,536), such as health fairs or Remote Area Medical (RAM)-type events, followed by schools (27.7%, n=720), a local community or tribal clinic

(18.8%, n=488), locations outside of the U.S. (14.9%, n=386), and hospitals 9.0% (n=18). Among the reasons given for providing volunteer dental services, 93.7% noted the “desire to give back.” Comparative data on volunteerism, collaboration, and technology use are not nationally available for all dentists.

Geographic Distribution of Hispanic/Latino Dentists in the U.S

Across U.S. Census Divisions, H/L dentists are most likely to locate in the South Atlantic (28.3%, n=1,639), Pacific (24.4%, n=1,412), and West South Central (14.4%, n=833) Divisions. Supplementary Table 7 provides the distribution of all URM dentists by Census Division. The ratio of percent of H/L dentists to the percent of all dentists in these three Divisions is greater than 1:1 (21) (Figure 1). This means that H/L dentists are more likely to be found in these Divisions relative to other dentists, while they are least likely (ratio below 0.5) to locate in the West North Central and East South Central Divisions. All U.S. Census Divisions reflect a poor H/L dentist to H/L population ratio, with only the South Atlantic below 1:5,000, the level at which the Health Resources and Services Administration (HRSA) can consider an area to qualify as a Dental Health Professional Shortage Area (15, 22) (Figure 2).

Study Limitations

Data presented are based on the weighted sample of respondents, not an actual census of all H/L providers, and the response rate was only 35.4%. Survey responses depend on provider memory across a variety of years, and therefore may be subject to recall bias. Item non-response varies, but is minimal. Nationally available data has been used to make comparisons to our data, but we do not collect non-URM dentist data in our study and therefore cannot conduct comparative statistical tests. A complete discussion of the survey methodology, response rate, weighting and adjustment for bias, including non-response bias as well as other limitations has been previously published (13).

DISCUSSION

The hallmarks of URM health care providers have been previously documented, including racial concordance with patients, a higher reported intention by URM health care students (versus non-URM) to serve URM populations, and practice location of minority dentists within high minority communities (11, 12, 23–25). This contemporary study further quantifies unique aspects of the H/L dentist workforce including a larger than average percent of this workforce compared to all dentists who are women (38.7%), foreign-born (50%), or foreign-trained (25%) (26), and the overall share of H/L dentists’ patients that are H/L (42% on average) and URM (59% on average). This is the first study to provide extensive additional details on their patients’ characteristics, including age, race, insurance coverage and medical conditions, as well as H/L dentists’ practice trajectories over time.

Although only 7% of H/L dentists reported working in a safety-net setting, the commitment of H/L dentists to serving underserved patients is evident in that 40% of all H/L clinicians report that they primarily serve the underserved, 58% accept public insurance, and among their patients, approximately 1 in 5 is reported to have low health literacy or to prefer a

language other than English. The average percent of diabetic patients treated by H/L clinical dentists is more than double the average in the U.S. population (23.1% vs 9.1 %), as is the average percent of patients with developmental disabilities (4.8% vs 2.5%) (18, 27), while the average percent of patients with hypertension (31.7%) is on par with the percent in the general U.S. population (32.5%) (19).

In the current policy environment, many states have phased out licensure pathways for foreign-trained dentists, while reliance on advanced standing or IDPs has risen (28, 29). This study shows the extraordinarily high debt burden placed on graduates of IDPs, which may dissuade foreign-trained H/L dentists from seeking U.S. licensure. For those who complete an IDP, the burden of educational debt may limit their ability to work in underserved communities (30). Given the percent of foreign-born and -trained H/L dentists, increasing reliance on the IDP raises concerns about the sustainability of the provider pipeline and these providers' ability to provide care to underserved populations in the future.

This study indicates that, as it stands, the current pipeline of H/L dentists is insufficient to bring providers to parity with the U.S. population. Based on dental school enrollment data, up to 2,262 H/L dental students will graduate between 2012 and 2017, while 552 dentists (95.1% of whom are clinical dentists) in our survey indicated intentions to retire in this time period, yielding a net increase of approximately 1,710 H/L U.S.-educated dentists over the six year period (31). Despite this modest increase in the H/L dentist population, an additional 31,194 H/L dentists are needed to reach parity with the current U.S. H/L population. Further, since the H/L population accounts for more than half of the total U.S. population growth, adding an estimated 285 H/L dentists to the field per year will not slow the growing workforce disparity (1). This disparity is most clearly shown in the ratio of H/L dentists to H/L population, which far exceeds even conservative definitions of shortages and is greatest (between 1:10,892 up to 1:12,209) in Census Divisions with states such as California and Texas with large H/L populations.

Finally, this study elucidates the diversity within the H/L dentist workforce and provides insights as to how it is changing over time. Explorations of diversity that compare a minority group to a majority group, while useful in some regards, often cast majority group data as the "norm" and ignore important variations within groups that may be more meaningful for driving understanding and decision-making. The H/L population displays great variation culturally, linguistically, and socioeconomically, and we find this same variation in H/L dentists in demographic background, education, and practice choices. For example, younger H/L dentists are more often from more highly educated backgrounds and urban upbringings than their older peers. Mirroring larger trends, disparities exist within components of the H/L workforce, such as the pay differentials by gender, and higher workload in safety-net settings.

CONCLUSION

H/L dental providers are drastically underrepresented in the dentist population, and those that are in practice shoulder a disproportionate share of dental care for minority and underserved communities. H/L dentists are a critical element of the workforce required to

address the oral health needs of H/L individuals. Improving the workforce diversity of dental providers is a critical part of strategy to address the unacceptably high burden of dental disease in the H/L population. To gain social justice and health equity, the culture among health professionals, researchers, administrators and providers must include awareness of and commitment to the needs of the underserved and unrepresented communities. Further investigation is needed to understand and develop sustainable strategies to expand the pipeline of H/L dentists and to understand the impact of debt, workforce policy and other programs on H/L dentists' practice patterns over time.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

References

1. Passel, JC., Lopez, M. Census 2010: 50 Million Latinos Hispanics Account for More Than Half of Nation's Growth in Past Decade. Washington DC: Pew Research Center; 2011.
2. Institute of Medicine. Improving Access to Oral Health Care for Vulnerable and Underserved Populations. Washington, DC: National Academies Press; 2011 May.
3. Institute of Medicine. Advancing Oral Health In America. Washington, DC: National Academies Press; 2011 Apr.
4. Smedley, B.Stith Butler, A., Bristow, L., editors. Institute of Medicine. In the Nation's Compelling Interest: Ensuring Diversity in the Health-Care Workforce. Washington, DC: National Academies Press; 2004.
5. U.S. Department of Health and Human Services. Oral Health in America: A Report of the Surgeon General. Rockville, MD: U.S. Department of Health and Human Services; 2000.
6. LaVeist TA, Nuru-Jeter A, Jones KE. The association of doctor-patient race concordance with health services utilization. *J Public Health Pol.* 2003; 24(3-4):312-23.
7. Meghani SH, Brooks JM, Gipson-Jones T, Waite R, Whitfield-Harris L, Deatrick JA. Patient-provider race-concordance: does it matter in improving minority patients' health outcomes? *Ethnic Health.* 2009; 14(1):107-30.
8. Health Resources and Services Administration. The Rationale for Diversity in the Health Professions: A Review of the Evidence. U.S. Department of Health and Human Services; 2006 Oct.
9. Dye BA, Thornton-Evans G, Li X, Iafolla TJ. Dental caries and sealant prevalence in children and adolescents in the United States, 2011-2012. *NCHS Data Brief.* 2015; (191):1-8.
10. National Center for Health Statistics. Health, United States, 2014: With Special Feature on Adults Aged 55-64. National Center for Health Statistics; Hyattsville, MD: 2015.
11. Brown LJ, Wagner KS, Johns B. Racial/ethnic variations of practicing dentists. *J Am Dent Assoc.* 2000; 131(12):1750-4. [PubMed: 11143740]
12. Hayes-Bautista DE, Kahramanian MI, Richardson EG, Hsu P, Sosa L, Gamboa C, et al. The rise and fall of the Latino dentist supply in California: implications for dental education. *J Dent Educ.* 2007; 71(2):227-34. [PubMed: 17314384]
13. Mertz E, Wides C, Cooke A, Gates P. Tracking workforce diversity in dentistry: importance, methods and challenges. *J Public Health Dent.* 2016; 76(1):38-46. [PubMed: 26183241]
14. Office Of Management and Budget (OMB). Revisions to the Standards for the Classification of Federal Data on Race and Ethnicity. 1997.
15. U.S. Census Bureau. 2010 Census Summary File 1, Tables QT-P3 and P6. In: generated by C. Wides using American FactFinder, editor. 2015.
16. American Dental Education Association. ADEA Survey of Dental School Seniors, 2012 Graduating Class Tables Report. Washington, D.C: Mar. 2014

17. American Dental Association. Income, Gross Billings, and Expenses: Selected 2014 Results from the Survey of Dental Practice (Tables in Excel). Chicago, IL: Health Policy Institute; 2015 Dec.
18. American Diabetes Association. Statistics About Diabetes. 2014. [Available from: <http://www.diabetes.org/diabetes-basics/statistics/>]
19. Centers for Disease Control and Prevention. Hypertension. Washington, D.C: 2014. Available from: <http://www.cdc.gov/nchs/fastats/hypertension.htm>
20. American Dental Association. Characteristics of Private Dental Practices: Selected 2014 Results from the Survey of Dental Practice (Tables in Excel). Chicago, IL: Health Policy Institute; 2015 Dec.
21. U.S. Department of Health and Human Services, Health Resources and Services Administration, National Center for Health Workforce Analysis. National and State-Level Projections of Dentists and Dental Hygienists in the U.S., 2012–2025. Rockville, MD: 2015.
22. U.S. Department of Health and Human Services, Health Resources and Services Administration, National Health Service Corps. Health Professional Shortage Area (HPSAs) Definition. Rockville, Maryland: 2015. Available from: <http://nhsc.hrsa.gov/ambassadors/hpsadefinition.html>
23. Montoya R, Hayes-Bautista D, Gonzales L, Smeloff E. Minority dental school graduates: do they serve minority communities? *Am J Public Health*. 1978; 68(10):1017–9. [PubMed: 717597]
24. Hispanic Dental Association. Disturbing Shortage of Hispanic Dentists to Serve Rising Hispanic Population. Austin, TX: Hispanic Dental Association; 2013.
25. Mertz EA, Grumbach K. Identifying communities with low dentist supply in California. *J Public Health Dent*. 2001; 61(3):172–7. [PubMed: 11603321]
26. American Dental Association. Distribution of Dentists in the United States by Region and State, 2009. Chicago IL: 2011 Apr.
27. Morstad, D. How Prevalent Are Intellectual and Developmental Disabilities in the United States?. Watertown, WI: Bethesda Institute; 2012.
28. Pannu V, Thompson AL, Pannu DS, Collins MA. Education for foreign-trained dentists in the United States: currently available findings and need for further research. *J Dent Educ*. 2013; 77(11):1521–4. [PubMed: 24192418]
29. Boorberg NB, Schonwetter DJ, Swain VL. Advanced placement, qualifying, and degree completion programs for internationally trained dentists in Canada and the United States: an overview. *J Dent Educ*. 2009; 73(3):399–415. [PubMed: 19289729]
30. Bazargan N, Chi DL, Milgrom P. Exploring the potential for foreign-trained dentists to address workforce shortages and improve access to dental care for vulnerable populations in the United States: a case study from Washington State. *BMC health services research*. 2010; 10(336)
31. American Dental Association Health Policy Institute. Report 1: Academic Programs, Enrollment and Graduates. Chicago, IL: 2015.

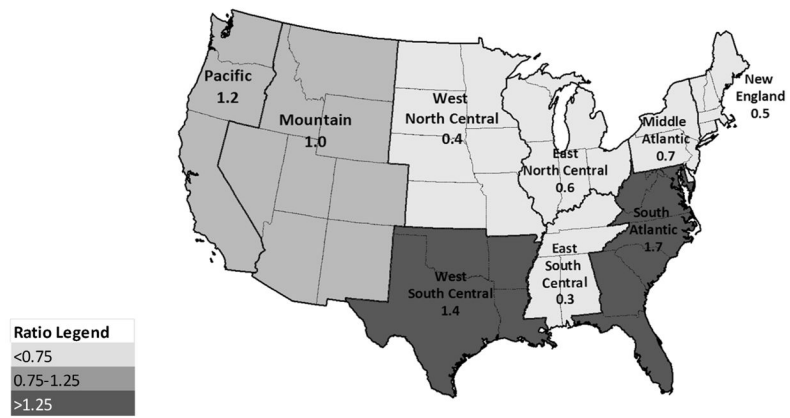


Figure 1. Ratio of Percent of Hispanic/Latino Dentists to Percent of All Dentists in the U.S. by Census Division

*Pacific division includes Hawaii and Alaska.

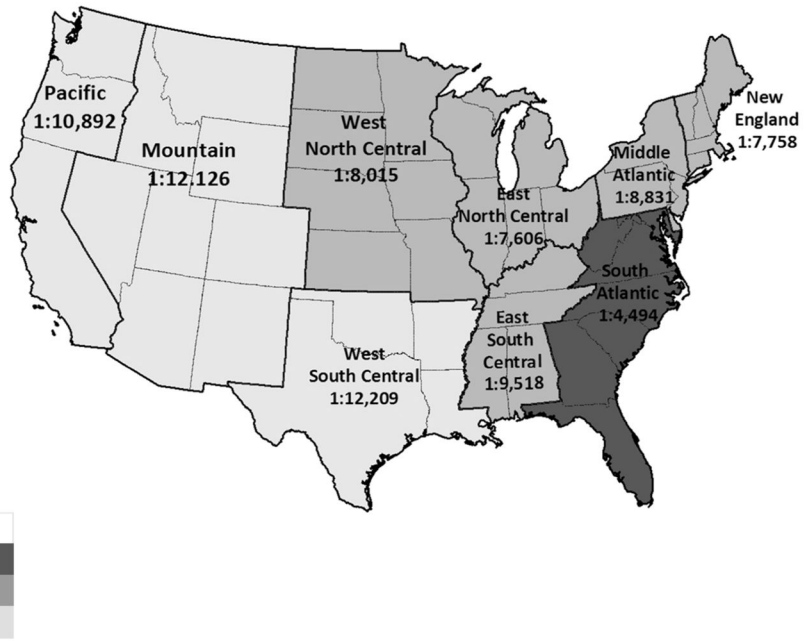


Figure 2. Ratio of Hispanic/Latino Dentists per Hispanic/Latino Population by U.S. Census Division

Table 1

Survey and Response of the Hispanic/Latino Dentist Workforce in the U.S.

	N*
Base Sample from ADA Masterfile Surveyed	2,173
Deceased/Retired/Unlicensed	-19
Undeliverable/Could Not Locate	-127
Identified as Non-URM	-75
Working Outside of the U.S.	-8
Adjusted Sample Surveyed	1,944
Total H/L Respondents (unweighted)	688
Survey Response Rate = Total Respondents/Adjusted Census	35.4%

* Unweighted sample and respondents

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Table 2

Pathways to Practice for Hispanic/Latino Dentists in the U.S.

	Total*	Did not Complete Residency	Completed Any Residency	Mean Educational Debt (2012 Adjusted Dollars)
1. U.S.-Trained = CODA Accredited Dental School for Initial Degree	74.8%	57.0%	43.0%	With Residency \$ 151,793
	4,163	2,371	1,792	Without Residency \$ 147,352
2. International Dentist Program = Foreign-Trained and CODA Graduate	9.1%	49.8%	50.2%	With Residency \$ 183,885
	508	253	255	Without Residency \$ 265,186
3. Foreign-Trained Only	16.1%	44.2%	55.8%	With Residency \$ 54,018
	896	396	500	Without Residency \$ 18,559
Total	100.0%	54.2%	45.8%	With Residency \$ 135,882
	5,567	3,020	2,547	Without Residency \$ 141,368
CODA Degree Ever	83.9%	56.2%	43.8%	With Residency \$ 155,829
	4,671	2,623	2,047	Without Residency \$ 158,424

* Missing data (n=215; 37 missing pathway data, 118 missing residency data, 60 missing both).

Table 3

Initial and Current Practice Settings of Hispanic/Latino Dentists

Practice Setting	Practice Type	Initial Primary Practice Setting [‡] (n=5,521)	Current Primary Practice Setting [‡] (n=5,229)	Average Year of Joining Current Primary Practice [¶] (n=4,929)	Current Secondary Practice Setting [‡] (n=1,260)
Solo Practice	Traditional	38.1% (n=2,104)	58.6% (n=3,064)	1982	14.8% (n=187)
Associate	Traditional	21.1% (n=1,164)	8.8% (n=461)	2005	12.2% (n=154)
Contractor	Traditional	10.4% (n=572)	5.4% (n=282)	2004	25.9% (n=326)
Group Practice	Traditional	6.0% (n=333)	9.7% (n=505)	2000	8.9% (n=112)
Corporate	Corporate	6.6% (n=366)	4.2% (n=220)	2005	6.0% (n=75)
Local or Federal Government	Public	2.1% (n=118)	2.3% (n=107)	1999	6.7% (n=85)
Public Health Corps	Public	1.1% (n=59)	0.0% (n=2)	2001	0.2% (n=2)
IHS	Safety-net	0.1% (n=7)	0.3% (n=18)	2004	0.5% (n=6)
Civil Hire on Indian Land	Safety-net	0.0% (n=2)	0.3% (n=15)	2007	0.0% (n=0)
Health Center	Safety-net	4.7% (n=261)	4.5% (n=235)	2003	7.8% (n=98)
Hospital	Safety-net	1.3% (n=74)	0.8% (n=42)	2005	1.8% (n=23)
Armed Forces	Safety-net	4.4% (n=241)	0.9% (n=49)	1996	1.0% (n=13)
Prison	Safety-net	0.3% (n=15)	0.2% (n=11)	2002	1.1% (n=14)
Educational Institution	Education	3.7% (n=194)	2.9% (n=13)	2001	13.1% (n=165)
Industry	Industry	0.0% (n=0)	0.5% (n=24)	Missing	0.0% (n=0)

* Missing data

[‡] Asked of all respondents (n=5,784)

[‡] Asked of all professionally active respondents (n=5,588)

[¶] Asked of clinically active dentists (n=5,342)

Table 4

Career Trajectories for Professionally Active Hispanic/Latino Dentists

Initial to Current Primary Practice Type	Count	Percent of Total	Percent of Sub-Total	Community-Based Experience (CBE)	Percent CBE by Progression Type
Traditional to Traditional	3,337	70.2%	92.0%	2,690	80.6%
Traditional to Corporate	43	0.9%	1.2%	40	93.0%
Traditional to Safety-net	74	1.6%	2.0%	57	77.0%
Traditional to Public	72	1.5%	2.0%	34	47.2%
Traditional to Education	101	2.1%	2.8%	80	79.2%
<i>Traditional Sub-Total</i>	<i>3,627</i>	<i>76.3%</i>	<i>100.0%</i>	<i>2,901</i>	<i>80.0%</i>
Corporate to Corporate	123	2.6%	37.3%	106	86.2%
Corporate to Traditional	194	4.1%	58.8%	165	85.1%
Corporate to Safety-net	2	0.0%	0.6%	2	100.0%
Corporate to Public	11	0.2%	3.3%	11	100.0%
<i>Corporate Sub-Total</i>	<i>330</i>	<i>6.9%</i>	<i>100.0%</i>	<i>284</i>	<i>86.1%</i>
Safety-net to Safety-net	229	4.8%	46.2%	215	93.9%
Safety-net to Traditional	243	5.1%	49.0%	177	72.8%
Safety-net to Corporate	21	0.4%	4.2%	21	100.0%
Safety-net to Public	3	0.1%	0.6%	*	0.0%
Safety-net to Education	*	0.0%	0.0%	*	0.0%
<i>Safety-net Sub-Total</i>	<i>496</i>	<i>10.4%</i>	<i>100.0%</i>	<i>413</i>	<i>83.3%</i>
Public to Public	67	1.4%	47.2%	64	95.5%
Public to Traditional	44	0.9%	31.0%	39	88.6%
Public to Corporate	10	0.2%	7.0%	10	100.0%
Public to Safety-net	12	0.3%	8.5%	12	100.0%
Public to Education	9	0.2%	6.3%	9	100.0%
<i>Public Sub-Total</i>	<i>142</i>	<i>3.0%</i>	<i>100.0%</i>	<i>134</i>	<i>94.4%</i>
Education to Education	67	1.4%	41.9%	64	95.5%

Initial to Current Primary Practice Type	Count	Percent of Total	Percent of Sub-Total	Community-Based Experience (CBE)	Percent CBE by Progression Type
Education to Traditional	69	1.5%	43.1%	63	91.3%
Education to Safety-net	24	0.5%	15.0%	24	100.0%
Education to Public	*	0.0%	0.0%	*	0.0%
<i>Education Sub-Total</i>	<i>160</i>	<i>3.4%</i>	<i>100.0%</i>	<i>151</i>	<i>94.4%</i>
Totals	4,755	100.0%		3,892	81.7%

* Missing

Table 5

Medical Conditions of Hispanic/Latino Dentists' Patient Population

	Percent of H/L clinical dentists who treat any patients with the characteristics shown (n=4,865)	Average percent of patient population for H/L dentists who treat any patients with the characteristics shown
Medically compromised	92.1%	21.1%
Diabetes	95.5%	23.1%
Physical disability	88.9%	6.9%
Hypertension	93.6%	31.7%
Developmental disability	79.2%	4.8%
Pregnant	86.2%	5.8%
Mental illness	76.4%	6.7%
Low oral health literacy	85.1%	23.6%
A severe behavior management problem	63.0%	7.3%
Long term care resident or homebound	55.5%	5.5%
HIV positive	68.8%	4.1%
Prefer health information in a language other than English	86.1%	28.0%

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Table 6

Demographics of Hispanic/Latino Dentists' Patient Population

Patient Age (years) (n=4,756)	Average Estimated Percent of Patient Pool*		
0 to 1	1.6%		
2 to 5	8.1%		
6 to 17	20.3%		
19 to 64	53.6%		
65 to 85	18.5%		
85+	5.1%		
Gender and Sexual Orientation (n=4,865)	Percent of H/L clinical dentists who treat any patients with the characteristic	Average percent patient population among all H/L dentists	
Female	97.1%	53.9%	
Lesbian, Gay, Bisexual, or Transgender	71.9%	6.6%	
Race (n=4,790)	Average Estimated % of Patient Pool*	Range (percent)	Percent of U.S. Population^{†, ‡}
African American/Black	13.0%	0–90	13.2 %
American Indian/Alaska Native	3.9%	0–100	1.7% [¶]
Hispanic/Latino	41.8%	0–100	16.2%
Caucasian/White	39.5%	0–100	74.1%
Asian/Pacific Islander	6.4%	0–65	5.5%
Insurance Status (n=4,796)	Percent of respondents who treat any of the patient population	Average percent of patient population*	Range of patient population reported (percent)
Private insurance	95.7%	52.2%	0–100
Public insurance	58.3%	28.5%	0–100
Uninsured/Out-of-pocket	94.8%	26.2%	0–100
Other	8.7%	9.8%	0–100

* Will not add to 100% because averages are based category, not on the patient population as a whole.

[†] Will not add to 100% because data does not include all Census designations and collapses race and ethnicity; respondents identifying as Hispanic/Latino may be included in any racial category.

[‡] U.S. Census Bureau. American Community Survey, 2012 American Community Survey 3-Year Estimates, Tables S0201 and B03002. In: Race along or in combination and Hispanic population by Census Division generated by C. Wides using American FactFinder, editor. 2015.

[¶] Norris T, Vines P, Hoeffel E. The American Indian and Alaska Native Population: 2010. US Census Bureau, 2012 January. Report No.: C2010BR-10.