# Who Goes into Postgraduate Dental Training and What Do They Do After?

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# Predictors and Practice Patterns of Post-Graduate Dental Training

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# Research Objectives

- Post-graduate dental (PGD) training, though not required for practice in most states, has grown significantly in recent years, largely in the fields of advanced general practice and pediatrics
- To further understand the growth and implications of PGD dental training, we formed two studies with the following objectives:
  1. "Trends in Post-graduate Dental Training": To examine the individual, educational, and policy factors that predict dentists pursuing PGD training
  2. "National Practice Patterns of Post-graduate-trained Dentist": To examine the individual, education, community, and policy factors that predict the practice patterns of post-graduate-trained dentists in the US

# Methods

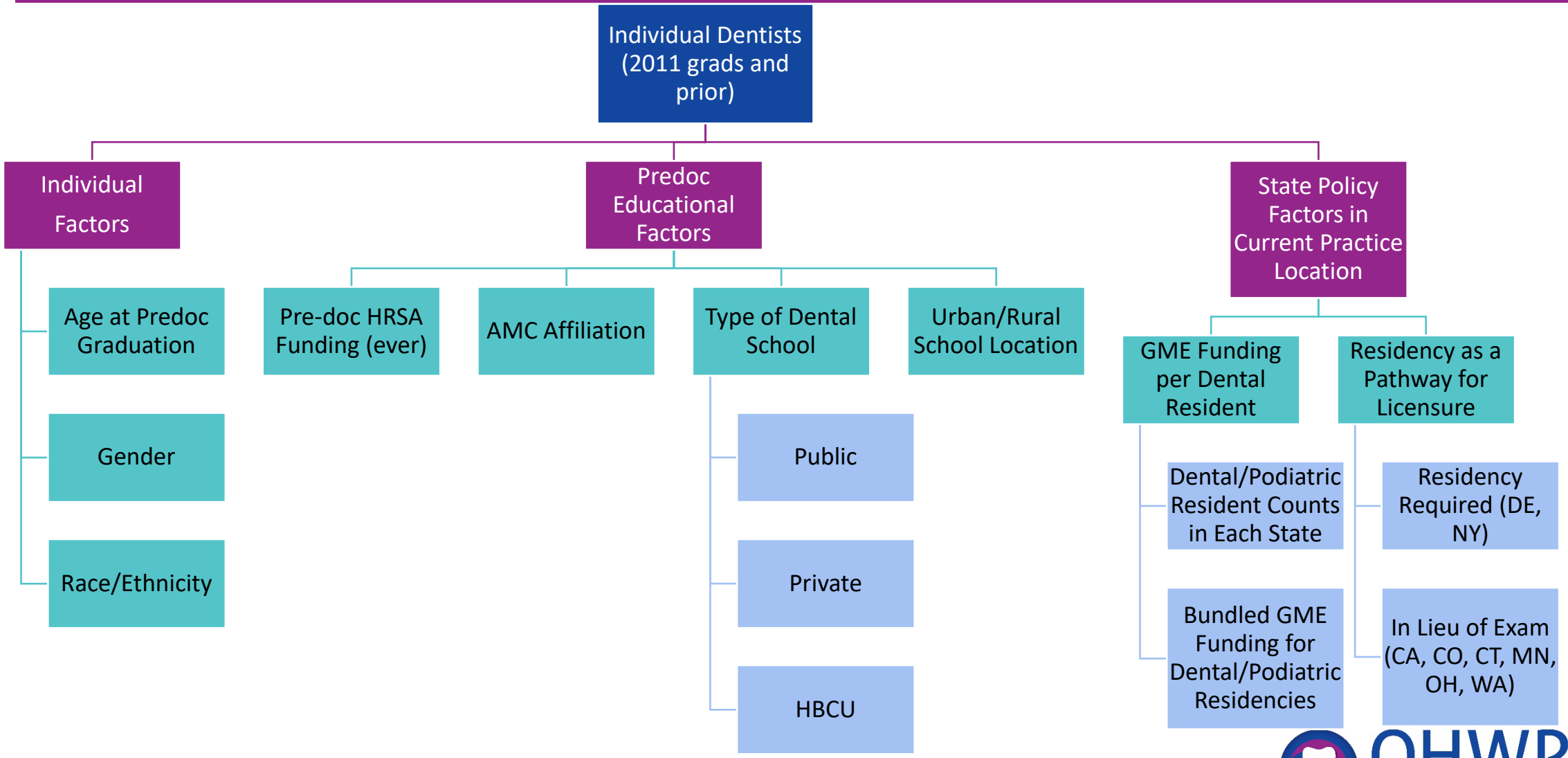
- Both studies used as a base file individual-level records from the 2017 American Dental Association Dentists Masterfile (all licensed dentists in the US)
- Individual records were linked to educational institution data at the pre- and –post- doctoral level based on school/residency program attended,
- Records were linked to community data (some at county, other at state level) based on county of practice.
- Generalized logistic models, adjusted for several factors in each study, were used to predict outcomes of interest
  - Post-graduate training, and post-graduate training in primary care
  - Serving Medicaid children (including taking new patients), and working in an Federally Qualified Health Center

# Study 1: Trends in Post-Graduate Dental Training

# Study Design

- The individual records from the 2017 ADA Masterfile were linked with predoctoral training program attributes and dental policy factors
- Descriptive methods identified differences in selected characteristics of three groups of practicing dentists:
  1. Those with PGD training in a primary care field
  2. Those with PGD training in a specialty field
  3. Those with DDS/DMD training only
- Generalized logistic models, adjusted for several factors, were used to predict the following outcomes:
  1. Attending any PGD program
  2. Attending a primary care PGD program (defined using HRSA categories as AEGD, GPR, pediatrics, or dental public health)

# Data Sources and Variables



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# Characteristics of Dentists by Type of Training

| | Pre-doc Only (1) | PGD Primary Care (2) | PGD Specialty Care (3) | P-value (1) vs (2), (3) | P-value (2) vs (3) |
|---|---|---|---|---|---|
| Mean Age at Graduation | 28 | 28 | 27.5 | <.001 | <.001 |
| Gender | | | | | |
| Male | 76.2% | 60.1% | 79.4% | <.001 | <.001 |
| Female | 23.8% | 39.9% | 20.6% | | |
| Race/Ethnicity | | | | | |
| White | 65.9% | 57.9% | 67.5% | <.001 | <.001 |
| African American/Black | 3.6% | 6.0% | 3.3% | | |
| Hispanic | 2.9% | 3.5% | 2.5% | | |
| Asian | 9.9% | 11.8% | 9.0% | | |
| Other | 1.0% | 1.3% | 1.1% | | |
| Unknown | 16.6% | 19.5% | 16.7% | | |
| Institution Type | | | | | |
| Public | 53.8% | 54.1% | 54.6% | <.001 | <.001 |
| Private | 44.1% | 42.1% | 43.5% | | |
| HBCU | 2.0% | 3.7% | 1.9% | | |

# Characteristics of Dentists by Type of Training

| | Pre-doc Only (1) | PGD Primary Care (2) | PGD Specialty Care (3) | P-value (1) vs (2), (3) | P-value (2) vs (3) |
|---|---|---|---|---|---|
| HRSA-sponsored Pre-doc | | | | | |
| Yes | 48.1% | 54.9% | 52.0% | <.001 | <.001 |
| No | 51.9% | 45.1% | 48.0% | | |
| Geography | | | | | |
| Large Metro | 83.3% | 85.4% | 84.1% | <.001 | <.001 |
| Mid-size Metro | 13.0% | 11.4% | 12.2% | | |
| Small Metro/Non-Metro | 3.8% | 3.2% | 3.8% | | |
| AMC-affiliated | | | | | |
| Yes | 89.6% | 92.8% | 92.2% | <.001 | <.001 |
| No | 10.4% | 7.2% | 7.8% | | |
| Residency Requirement | | | | | |
| Required | 6.9% | 18.4% | 9.8% | <.001 | <.001 |
| Optional | 22.5% | 16.7% | 20.1% | | |
| Not required | 70.6% | 64.9% | 70.1% | | |
| Mean GME Funding per Residency Slot | $142,957 | $148,558 | $145,105 | <.001 | <.001 |
| Number of Dentists (N) | 99,588 | 28,214 | 24,173 | | |

# Factors Predicting PGD Training of Any Kind, and PGD Training in Primary Care

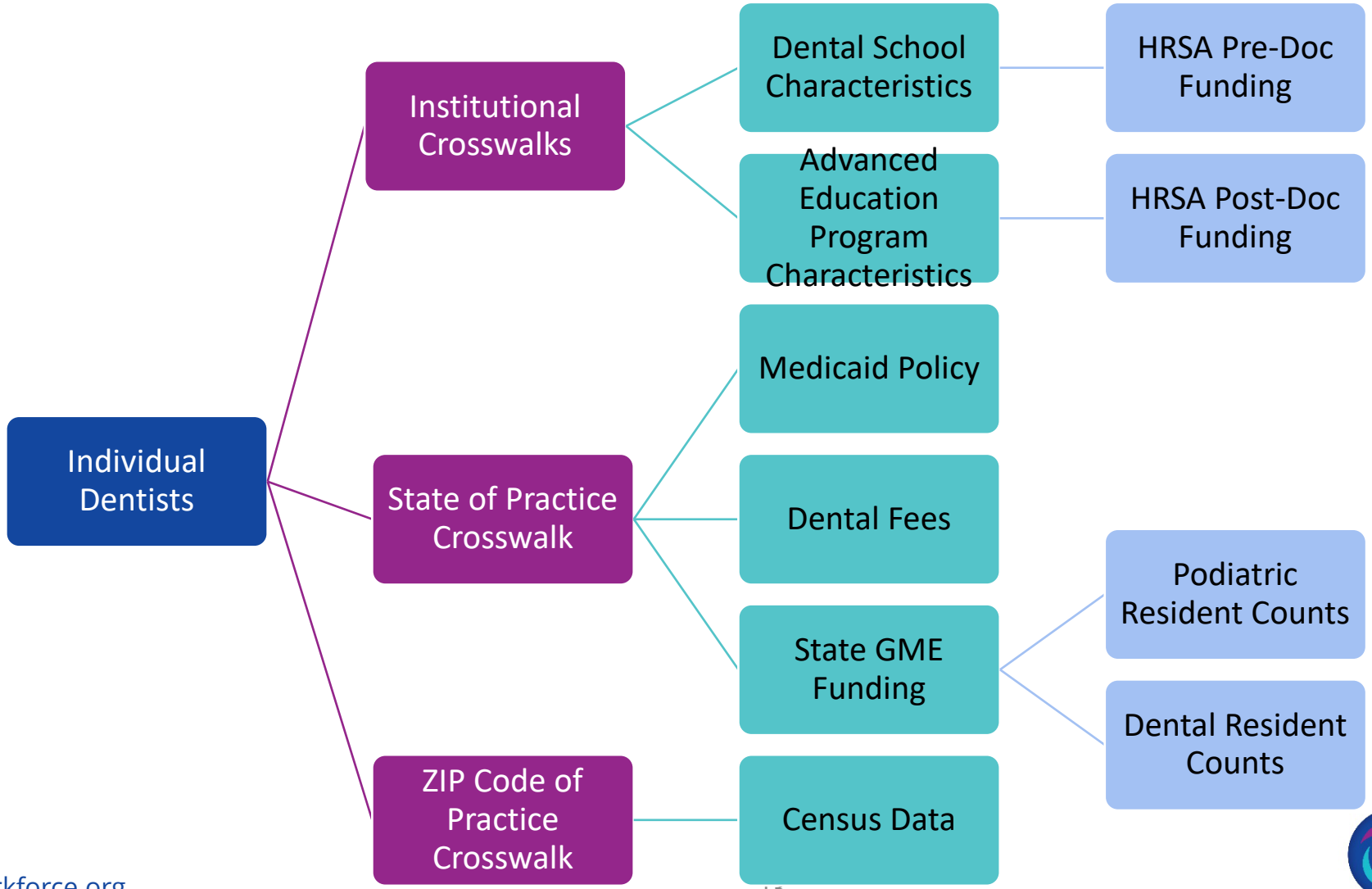
| | PGD Training of Any Type | PGD Training in Primary Care |
|---|---|---|
| **Individual Characteristics** | | |
| **Male (ref: Female)** | 0.71 [0.69, 0.73]*** | 0.49 [0.48, 0.50]*** |
| **Black (ref: White)** | 1.17 [1.10, 1.26]*** | 1.36 [1.26, 1.48]*** |
| **Hispanic** | 1.05 [0.99, 1.12]*** | 1.20 [1.11, 1.30]*** |
| **Asian** | 1.09 [1.05, 1.13]*** | 1.23 [1.18, 1.29]*** |
| **Other (AI/AN + Native Hawaiian or PI + other)** | 1.22 [1.10, 1.34]*** | 1.34 [1.18, 1.52]*** |
| **Unknown Race/Ethnicity** | 1.10 [1.07, 1.14]*** | 1.18 [1.14, 1.22]*** |
| **Age at Graduation** | 0.97 [0.97, 0.98]*** | 0.99 [0.98, 0.99]*** |
| *** p < 0.1, ** p < 0.05, *** p < 0.01** | | |

# Factors Predicting PGD Training of Any Kind, and PGD Training in Primary Care

| | PGD Training of Any Type | PGD Training in Primary Care |
|---|---|---|
| **Institutional Characteristics** | | |
| HRSA-sponsored Pre-doc Institution (ever) | 1.18 [1.15, 1.20]*** | 1.20 [1.16, 1.23]*** |
| AMC-affiliated Pre-doc Institution | 1.26 [1.21, 1.32]*** | 1.21 [1.15, 1.27]*** |
| Private School (ref: Public) | 0.87 [0.85, 0.90]*** | 0.81 [0.78, 0.83]*** |
| HBCU | 1.20 [1.10, 1.31]*** | 1.32 [1.19, 1.46]*** |
| Mid-size Metro Location (ref: Urban) | 0.97 [0.93, 1.00]** | 0.95 [0.91, 1.00]** |
| Small Metro/Non-Metro Location | 0.97 [0.91, 1.03] | 0.94 [0.87, 1.02]** |
| **Policy Characteristics** | | |
| GME Funding for Residencies | 1.16 [1.13, 1.20]*** | 1.24 [1.19, 1.30]*** |
| Residency Option for Licensure (ref: No Option) | 0.99 [0.97, 1.02] | 0.97 [0.94, 1.00]* |
| Residency Required for Licensure | 2.15 [2.06, 2.24]*** | 2.90 [2.77, 3.03]*** |
| Constant | 0.80 [0.72, 0.90]*** | 0.34 [0.29, 0.39]*** |
| Number of observations | 151,975 | 127,802 |
| AIC | 191992.8 | 128717.8 |
| BIC | 192161.6 | 128883.7 |
| Log Likelihood | -95979.4 | -64341.922 |
| * p < 0.1, ** p < 0.05, *** p < 0.01 | | |

# Study 2: National Practice Patterns of Post-Graduate Trained Dentists

# Study Design



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# Results – Serving Medicaid Children

- **Individual and Practice attributes that predicted serving Medicaid children:** combination of gender and race compared to white females – particularly Black women and Black men – as well as dentists initially foreign trained and dentists who work as contractors or employees/associates compared to practice owners
- Pediatric dentists were most likely to serve Medicaid children and accept new Medicaid patients
- Dentists practicing in rural and high poverty communities were more likely to serve Medicaid children

- **Residency program attributes that predicted serving Medicaid children**: HRSA post-doctoral funding and training being community-based
- **Policy/Community Factors that predicted serving Medicaid children:** States with higher levels of GME investment, higher Medicaid rates, and more generous adult dental benefits increase the likelihood of providing services to Medicaid children

# Results – Working in an FQHC

- Black women are the most likely race/gender combination to work in an FQHC
- Despite their high participation in Medicaid, pediatric dentists were less likely to work in an FQHC
- Residency program attributes that predict working in an FQHC: HRSA post-doctoral funding and being a community-based training program (vs. dental school-based)
- Dentists practice in rural and high poverty communities were more likely to work in an FQHC
- Any enhancement to state Medicaid policy (except FFS rates) improves the odds of a dentist working in an FQHC

# Factors predicting PGD-trained dentists providing services to Medicaid children, accepting new Medicaid patients (children), and providing services at an FQHC

| | Provides Services to Medicaid Children | Accepts New Medicaid Patients (Children) | Provides Services at FQHC | Medicaid and FQHC factors in opposition |
|---|---|---|---|---|
| **Individual Characteristics** | | | | |
| Pediatric Specialist (ref. GP, DPH) | 3.08 [2.88, 3.30]*** | 1.18 [1.03, 1.35]** | 0.94 [0.83, 1.08] | |
| Other Specialist | 0.90 [0.86, 0.94]*** | 1.07 [0.97, 1.18] | 0.40 [0.36, 0.45]*** | |
| White Male (ref. White Female) | 1.25 [1.18, 1.33]*** | 0.92 [0.81, 1.05] | 0.78 [0.68, 0.89]*** | X |
| Black Male | 2.87 [2.52, 3.27]*** | 2.37 [1.73, 3.30]*** | 2.94 [2.42, 3.56]*** | |
| Black Female | 2.51 [2.21, 2.86]*** | 2.14 [1.57, 2.97]*** | 2.07 [1.63, 2.59]*** | |
| Hispanic Male | 1.31 [1.11, 1.54]*** | 1.47 [1.02, 2.19]** | 1.53 [1.14, 2.01]*** | |
| Hispanic Female | 1.42 [1.23, 1.65]*** | 1.61 [1.14, 2.33]*** | 1.33 [0.97, 1.78]* | |
| Asian Male | 1.32 [1.19, 1.46]*** | 1.08 [0.86, 1.36] | 1.21 [1.00, 1.45]** | |
| Asian Female | 1.61 [1.46, 1.77]*** | 0.89 [0.73, 1.09] | 0.83 [0.67, 1.03]* | X |
| Other Male | 1.34 [1.02, 1.74]** | 1.65 [0.90, 3.32] | 0.82 [0.45, 1.38] | |
| Other Female | 1.37 [1.08, 1.72]*** | 0.88 [0.55, 1.45] | 1.01 [0.58, 1.65] | |
| Unknown Race/Ethnicity Male | 1.35 [1.24, 1.48]*** | 1.27 [1.04, 1.56]** | 1.30 [1.11, 1.51]*** | |
| Unknown Race/Ethnicity Female | 1.51 [1.40, 1.62]*** | 1.07 [0.90, 1.26] | 0.77 [0.66, 0.91]*** | X |
| Years in Practice (Since Pre-doc Training) | 0.98 [0.98, 0.98]*** | 0.99 [0.98, 0.99]*** | 0.99 [0.98, 1.00]*** | |
| Foreign-trained (Pre-doc, y/n) | 1.14 [1.04, 1.24]*** | 0.96 [0.79, 1.16] | 0.96 [0.80, 1.14] | |
| **Practice Characteristics** | | | | |
| Practice Type: Contractor (ref: Owner) | 1.28 [1.13, 1.45]*** | 1.33 [1.02, 1.77]** | 2.57 [2.00, 3.28]*** | |
| Practice Type: Employee | 1.14 [1.08, 1.21]*** | 1.23 [1.08, 1.39]*** | 2.89 [2.56, 3.27]*** | |
| Practice Type: Unknown | 0.94 [0.89, 0.99]** | 1.37 [1.22, 1.54]*** | 3.61 [3.22, 4.06]*** | X |
| Practice Location: Rural (y/n) | 1.41 [1.29, 1.55]*** | 0.83 [0.70, 0.98]** | 1.83 [1.54, 2.16]*** | |
| Practice Location: County % Pop below FPL | 13.95 [9.23, 21.1]*** | 0.62 [0.25, 1.55] | 165.21 [71.28, 381.91]*** | |
| Practice Location: County % General DDS Accepts Medicaid (y/n) | 1.24 [1.23, 1.25]*** | 1.02 [1.01, 1.03]*** | 1.05 [1.03, 1.06]*** | |

* p < 0.1, ** p < 0.05, *** p < 0.01

# Factors predicting PGD-trained dentists providing services to Medicaid children, accepting new Medicaid patients (children), and providing services at an FQHC

| | Provides Services to Medicaid Children | Accepts New Medicaid Patients (Children) | Provides Services at FQHC | Medicaid and FQHC factors in opposition |
|---|---|---|---|---|
| PGD Institutional Characteristics | | | | |
| HRSA-sponsored (y/n) | 1.09 [1.04, 1.14]*** | 1.05 [0.96, 1.16] | 1.20 [1.09, 1.33]*** | |
| Community-based (ref: Dental School Based) | 1.16 [1.11, 1.22]*** | 1.18 [1.06, 1.30]*** | 1.28 [1.15, 1.42]*** | |
| Unknown Program Type | 1.14 [0.93, 1.38] | 1.14 [0.75, 1.79] | 1.08 [0.70, 1.60] | |
| State-level Policy Characteristics | | | | |
| GME Funding for Residencies | 1.19 [1.13, 1.27]*** | 0.57 [0.49, 0.66]*** | 1.02 [0.90, 1.16] | |
| Medicaid Reimbursement Rates | 3.03 [2.66, 3.44]*** | 7.59 [5.69, 10.14]*** | 0.85 [0.65, 1.12] | |
| Medicaid Benefits Expansion (y/n) | 0.89 [0.85, 0.94]*** | 0.93 [0.82, 1.04] | 1.39 [1.23, 1.58]*** | X |
| Medicaid Limited Adult Dental Benefits (ref: None/Emergency Only) | 1.18 [1.11, 1.26]*** | 3.97 [3.39, 4.67]*** | 1.21 [1.04, 1.41]** | |
| Medicaid Extensive Adult Dental Benefits | 1.10 [1.03, 1.17]*** | 1.07 [0.94, 1.21] | 1.42 [1.24, 1.63]*** | |
| Constant | 0.03 [0.02, 0.03]*** | 2.39 [1.65, 3.45]*** | 0.01 [0.01, 0.01]*** | |
| Number of observations | 54,216 | 18,933 | 54,216 | |
| AIC | 61703.2 | 14598.6 | 17564.4 | |
| BIC | 61970.2 | 14834.1 | 17831.4 | |
| Log Likelihood | -30821.601 | -7269.321 | -8752.183 | |

* p < 0.1, ** p < 0.05, *** p < 0.01

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# Discussion and Conclusions

# Conclusions

## Trends in Post-Graduate Training

- State and federal policy, as well as educational setting and personal factors, heavily impacts the choice to pursue PGD training
- Federal investments (HRSA funding predoctoral dental education GME) and state licensure requirements significantly increases the odds dentists will go on to PGD training
- Women and minority dentists are more likely to pursue primary care PGD training

## National Practice Patterns of Post-Graduate Trained Dentists

- HRSA funding at the post-graduate level increases the odds that PGD graduates from those programs will serve Medicaid patients, but Medicaid policies strongly impact capacity to accept new patients
- Black dentists, though significantly underrepresented, are more than twice as likely to serve Medicaid children and work in FQHC settings. This reinforces the urgent need to expand workforce diversity in dentistry

# Implications for Policy and Practice

Federal investment and state licensure requirements for PGD training, as well as educational program structure, can potentially leverage national workforce development goals to expand high-quality training in primary care and improve access for underserved patients

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