Native Hawaiian and Other Pacific Islander Representation Among US Allopathic Medical Schools, Residency Programs, and Faculty Physicians

Kekoa Taparra, MD, PhD; Curtiland Deville Jr, MD

Introduction

Native Hawaiian and Other Pacific Islander individuals are 1 of 5 official US racial categories, as designated by the US Census Bureau and Office of Management and Budget, and remain underacknowledged in health care research. Native Hawaiian and Other Pacific Islander individuals (who are of Melanesian, Micronesian, and Polynesian descent) are not synonymous with Asian individuals. They experience disproportionate health disparities yet are the least represented racial group in the medical professions. Native Hawaiian individuals compose 20% of the population of Hawai‘i but less than 4% of the physician workforce. National physician workforce diversity research inappropriately aggregates or excludes Native Hawaiian and Other Pacific Islander individuals. Here, we analyze the representative quotients (RQs) of allopathic medical students, residents, and physicians who identify as Native Hawaiian and Other Pacific Islander.

Methods

The Gundersen Health System institutional review board approved this cross-sectional study, which was conducted and reported according to Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) reporting guideline. Publicly available medical student matriculant, resident, and academic faculty data between January 1, 2000, and December 31, 2020, were obtained by the Association of American Medical Colleges (AAMC); informed consent was waived by Gundersen Health System because the data were deidentified and publicly available. Participants self-identified as Native Hawaiian and Other Pacific Islander via the AAMC National Graduate Medical Education Census and US Census Bureau/Office of Management and Budget criteria.

As reported previously, an RQ is the proportion of a subgroup compared with the US population: an RQ of 1 denotes equal representation; greater than 1, overrepresentation; and less than 1, underrepresentation. Representative quotient denominators reflected 2000-2020 US census data. Linear regression was used to assess time vs RQ of Native Hawaiian and Other Pacific Islander individuals. Medians, ranges, RQ slope estimates, P values, and 95% CIs were calculated. All tests were 2 tailed with Bonferroni correction for multiple testing (Q values in the Table). Significance was set at P = .05. All analyses were conducted with R version 4.0.3 in RStudio (R Project for Statistical Computing).

Results

All participants in the study self-identified as Native Hawaiian and Other Pacific Islander. Between 2000 and 2020, there was overall underrepresentation of Native Hawaiian and Other Pacific Islander individuals; the numbers (RQs) for medical students, residents, and faculty physicians were 41 individuals (0.39), 82 individuals (0.37), and 85 individuals (0.40), respectively (Table; Figure, A).

There were no significant changes in the number of medical student matriculants identifying as Native Hawaiian and Other Pacific Islander alone (individuals who reported Native Hawaiian and Other Pacific Islander as their only race) (RQ slope, −6.3; 95% CI, −12 to −0.44; Q = 0.15), in combination (individuals who reported Native Hawaiian and Other Pacific Islander alone or in
combination with ≥1 other race) (RQ slope, −6.3; 95% CI, −12 to −0.44; Q = 0.15), and alone or in combination (RQ slope, −7.4; 95% CI, −22 to 7.5; Q > 0.99) between 2002 and 2020 (Figure, B). The median annual total medical student matriculants for Native Hawaiian and Other Pacific Islander individuals alone and alone or in combination were 53 (range, 23-115) and 184 (range, 104-232).

| Characteristic                        | RQ slope estimate (95% CI) | P value | Q value^a |
|---------------------------------------|---------------------------|---------|-----------|
| **Medical students**                  |                           |         |           |
| Alone                                 | −6.3 (−12 to −0.44)       | .05     | 0.15      |
| In combination                        | 10 (0.15 to 20)           | .06     | 0.19      |
| Alone or in combination with 1 or more races | −7.4 (−22 to 7.5)       | .35     | >0.99     |
| **Residents**                         |                           |         |           |
| Anesthesia                            | −5.8 (−7.6 to −3.9)       | <.001   | <0.001    |
| Dermatology                           | −3.7 (−7.0 to −0.48)      | .04     | 0.77      |
| Emergency medicine                    | −5.2 (−7.9 to −2.5)       | .002    | 0.04      |
| Family medicine                       | −1.5 (−2.3 to −0.61)      | .004    | 0.09      |
| Internal medicine                     | −2.8 (−4.6 to −1.1)       | .007    | 0.13      |
| Neurosurgery                          | −3.8 (−5.8 to −1.9)       | .002    | 0.03      |
| Neurology                             | −4.3 (−6.7 to −1.9)       | .003    | 0.07      |
| Obstetrics/gynecology                 | −5.0 (−7.1 to −2.9)       | <.001   | 0.01      |
| Ophthalmology                         | −2.9 (−4.3 to −1.6)       | <.001   | 0.01      |
| Orthopedic surgery                    | −6.4 (−8.5 to −4.2)       | <.001   | <0.001    |
| Otolaryngology                        | −6.1 (−11 to −1.3)        | .02     | 0.47      |
| Pathology                             | −4.5 (−6.0 to −3.0)       | <.001   | <0.001    |
| Pediatrics                            | −3.4 (−4.8 to −2.0)       | <.001   | 0.01      |
| Physical medicine and rehabilitation  | −2.5 (−3.6 to −1.4)       | <.001   | 0.01      |
| Plastic surgery                       | −5.2 (−7.7 to −2.7)       | <.001   | 0.02      |
| Psychiatry                            | −7.1 (−8.7 to −5.4)       | <.001   | <0.001    |
| Radiation oncology                    | −2.9 (−4.5 to −1.2)       | .004    | 0.08      |
| Radiology                             | −7.4 (−11 to −3.9)        | <.001   | 0.01      |
| General surgery                       | −9.1 (−13 to −4.7)        | <.001   | 0.02      |
| Urology                               | −5.4 (−11 to 0.39)        | .09     | >0.99     |
| **Academic faculty**                  |                           |         |           |
| Anesthesia                            | −15 (−39 to 7.9)          | .22     | >0.99     |
| Dermatology                           | 4.9 (1.4 to 8.4)          | .02     | 0.28      |
| Emergency medicine                    | 16 (−5.0 to 36)           | .16     | >0.99     |
| Family medicine                       | −3.5 (−23 to 16)          | .72     | >0.99     |
| Internal medicine                     | 14 (7.2 to 20)            | <.001   | 0.02      |
| Neurosurgery                          | 4.6 (−1.9 to 11)          | .19     | >0.99     |
| Neurology                             | 13 (5.5 to 21)            | .005    | 0.09      |
| Obstetrics/gynecology                 | −1.3 (−9.3 to 6.6)        | .75     | >0.99     |
| Ophthalmology                         | 0.67 (−16 to 17)          | .94     | >0.99     |
| Orthopedic surgery                    | −12 (−41 to 18)           | .46     | >0.99     |
| Otolaryngology                        | 0.54 (−12 to 13)          | .93     | >0.99     |
| Pathology                             | −12 (−25 to 0.61)         | .08     | >0.99     |
| Pediatrics                            | 10 (0.73 to 19)           | .05     | 0.95      |
| Physical medicine and rehabilitation  | −3.0 (−6.8 to 0.79)       | .14     | >0.99     |
| Plastic surgery                       | NA^b                      | NA^b    | NA^b      |
| Psychiatry                            | −9.5 (−26 to 7.2)         | .28     | >0.99     |
| Radiation oncology                    | −1.6 (−4.2 to 1.0)        | .24     | >0.99     |
| Radiology                             | NA^b                      | NA^b    | NA^b      |
| General surgery                       | 13 (−1.7 to 28)           | .11     | >0.99     |
| Urology                               | −3.0 (−9.4 to 3.4)        | .38     | >0.99     |

Abbreviations: NA, not available; RQ, representative quotient.
^a Bonferroni correction for multiple testing.
^b Not available owing to no recorded Native Hawaiian and Other Pacific Islander representation to evaluate RQ trend. Medical students are reported by Native Hawaiian and Other Pacific Islander racial categories of alone, in combination, and alone or in combination with 1 or more races. Residents and academic faculty are reported by the 20 largest specialties.
Figure. Representative Quotient (RQ) of Native Hawaiian and Other Pacific Islander (NHPI) Individuals Across Medical Specialties

A) Total NHPI RQs of medical student matriculants, residents, and academic faculty

B) Medical student matriculant RQ line plots categorized by NHPI alone, in combination, or alone or in combination

C) Resident NHPI RQ line plots by specialty

D) Academic faculty member NHPI RQ line plots by specialty

Specialties are arranged from least to most represented. The RQ of 1 denotes an equal proportion of Native Hawaiian and Other Pacific Islander representation compared with the US population. The dashed line represents RQ = 0.5, denoting half of the Native Hawaiian and Other Pacific Islander representation compared with the US population. In panels B-D, the blue lines represent the linear regression over time, with 95% CIs represented by the shaded area.
respectively. The median annual RQs for Native Hawaiian and Other Pacific Islander alone and alone or in combination were 0.56 (range, 0.30-1.44) and 0.90 (range, 0.77-1.37), respectively.

The Native Hawaiian and Other Pacific Islander resident RQ decreased across all specialties between 2002 and 2020 (Figure, C). Internal medicine, family medicine, pediatrics, and general surgery contributed approximately half of Native Hawaiian and Other Pacific Islander residents annually. Median annual Native Hawaiian and Other Pacific Islander residents across specialties was 234 (range, 81-582), with a median RQ of 1.27 (range, 0.37-3.46). After adjusting for multiple testing, most specialties had significantly decreasing RQs.

Most specialties showed a decrease to an RQ of less than or equal to 0.5 among Native Hawaiian and Other Pacific Islander faculty between 2000 and 2018 (Figure, D). The median RQ was 0.47 (range, 0.10-0.61). There were no recorded Native Hawaiian and Other Pacific Islander academic faculty in plastic surgery, radiology, or orthopedic surgery. The most represented specialties included pediatrics, internal medicine, obstetrics/gynecology, and psychiatry.

Discussion

In this study, we detail the substantial underrepresentation of Native Hawaiian and Other Pacific Islander individuals among US medical students, residents, and faculty. Medical students identifying as Native Hawaiian and Other Pacific Islander alone vs alone or in combination had an RQ of less than 0.5 vs 1.0, respectively, underscoring the nuance of these data; more individuals who are Native Hawaiian and Other Pacific Islander self-identify as multiracial compared with individuals in other US racial groups.2 The number of Native Hawaiian and Other Pacific Islander residents appears to be significantly declining and unequally distributed across specialties. Their representation should be prioritized, particularly in specialty programs, through early mentorship, recruitment, and retention. Despite being critical to mentoring indigenous trainees, Native Hawaiian and Other Pacific Islander faculty representation has not improved in the past 2 decades. This study is limited by the fact that Native Hawaiian and Other Pacific Islander residents and faculty who self-identified as multiracial in the AAMC National Graduate Medical Education Census were masked within a separate “multiracial” group and were unable to be included in this study owing to AAMC data collection methods.1,5,6 It would be beneficial for organizations to increase transparency and granularity when reporting data on race and ethnicity, which will facilitate more accurate tracking of Native Hawaiian and Other Pacific Islander representation without excluding those who identify as multiracial.

Overall, equal representation is important, given that when Native Hawaiian and Other Pacific Islander patients are treated by racially concordant physicians, there is improvement in patient-reported satisfaction, quality, and health care outcomes.1 With the paucity of Native Hawaiian and Other Pacific Islander individuals in medicine, advocacy is challenging but necessary for the health of their growing communities. Future studies are warranted to elucidate systemic barriers to the Native Hawaiian and Other Pacific Islander physician workforce pipeline.

ARTICLE INFORMATION

Accepted for Publication: July 8, 2021.

Published: September 20, 2021. doi:10.1001/jamanetworkopen.2021.25051

Open Access: This is an open access article distributed under the terms of the CC-BY License. © 2021 Taparra K et al. JAMA Network Open.

Corresponding Author: Kekoa Taparra, MD, PhD, 875 Blake Wilbur Dr, Stanford, CA 94305-5847 (kekoa.taparra@stanford.edu).

Author Affiliations: Department of Radiation Oncology, Stanford University, Palo Alto, California (Taparra); Department of Radiation Oncology and Molecular Radiation Sciences, Johns Hopkins University, Baltimore, Maryland (Deville).
Author Contributions: Drs Taparra and Deville had full access to all of the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.

Concept and design: Both authors.

Acquisition, analysis, or interpretation of data: Both authors.

Drafting of the manuscript: Both authors.

Critical revision of the manuscript for important intellectual content: Both authors.

Statistical analysis: Both authors.

Administrative, technical, or material support: Deville.

Supervision: Deville.

Conflict of Interest Disclosures: None reported.

Funding/Support: Dr Taparra reported receiving financial support from the American Society for Radiation Oncology, American Society of Clinical Oncology, and American Society of Hematology by means of providing fellowship opportunities to advance the diversification of the physician workforce in radiation oncology, oncology, and hematology/oncology, respectively.

Role of the Funder/Sponsor: The funders had no role in the design and conduct of the study; collection, management, analysis, and interpretation of the data; preparation, review, or approval of the manuscript; and decision to submit the manuscript for publication.

REFERENCES

1. Taparra K. Pacific Islanders searching for inclusion in medicine. JAMA Heal Forum. 2021;2(2):e210153. doi:10.1001/jamahealthforum.2021.0153

2. Hixson L, Hepler B, Kim MO. The Native Hawaiian and Other Pacific Islander population: 2010. Published May 2012. Accessed June 25, 2020. https://www.census.gov/prod/cen2010/briefs/c2010br-l2.pdf

3. Taparra K, Miller RC, Deville C Jr. Navigating Native Hawaiian and Pacific Islander cancer disparities from a cultural and historical perspective. JCO Oncol Pract. 2021;17(3):130-134. doi:10.1200/OP.20.00831

4. Association of American Medical Colleges. Table A-14.3: race/ethnicity responses (alone and in combination) of matriculants to US medical schools, 2016-2017 through 2020-2021. Published October 26, 2020. Accessed June 25, 2020. https://www.aamc.org/media/8826/download

5. Lett LA, Murdock HM, Orji WU, Aysola J, Sebro R. Trends in racial/ethnic representation among US medical students. JAMA Netw Open. 2019;2(9):e1910490. doi:10.1001/jamanetworkopen.2019.10490

6. Brotherton SE, Etzel SI. Graduate medical education, 2019-2020. JAMA. 2020;324(12):1230-1250. doi:10.1001/jama.2020.14635