

# Examining Wage Disparities by Race and Ethnicity of Health Care Workers

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**Background:** Prior studies demonstrated that wage disparities exist across race and ethnicity within selected health care occupations. Wage disparities may negatively affect the industry's ability to recruit and retain a diverse workforce throughout the career ladder.

**Objective:** To determine whether wage disparities by race and ethnicity persist across health care occupations and whether disparities vary across the skill spectrum.

**Research Design:** Retrospective analysis of 2011–2018 data from the Current Population Survey using Blinder-Oaxaca decomposition regression methods to identify sources of variation in wage disparities. Separate models were run for 9 health care occupations.

**Subjects:** Employed individuals 18 and older working in health care occupations, categorized by race/ethnicity.

**Measures:** Annual wages were predicted as a function of race/ethnicity, age, sex, marital status, having a child under 5 in the household, living in a metro area, highest education attained, and usual hours worked.

**Results:** Non-Hispanics consistently made more than Hispanic licensed practical/vocational nurses (LPNs/LVNs), aides/assistants, technicians, and community-based workers. Asian/Pacific Islanders consistently made more than Black, American Indian/Alaska Native, and Multiracial individuals across occupations except physicians, advanced practitioners, or therapists. Asian/Pacific Islanders only

made significantly less when compared with White physicians, but more than White advanced practitioners, registered nurses, LPNs/LVNs, and aides/assistants. Based on observed attributes, Black registered nurses, LPNs/LVNs, and aides/assistants were predicted to make more than their White peers, but unexplained variation negated these gains.

**Conclusions:** Many wage gaps remained unexplained based on measured factors warranting further study. Addressing wage disparities is critical to advance in careers and reduce job turnover.

**Key Words:** health workforce, health professionals, wages, discrimination, race, ethnicity

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Recruiting and retaining a diverse health workforce contributes to reducing health disparities and improving health equity.<sup>1,2</sup> Studies have shown that patients prefer providers who share similar sex, racial, ethnic, and/or language characteristics (also known as patient-provider concordance), which affects patient-provider communication and trust-building as well as patient satisfaction.<sup>3–8</sup> While the number of robust studies linking concordance to improvement in health outcomes is limited, 1 randomized trial found that Black men assigned to Black physicians were 18 percentage points more likely to obtain preventive services compared with Black men assigned to non-Black physicians.<sup>9</sup> Another study found that Black physicians caring for Black mothers resulted in lower mortality for Black infants.<sup>10</sup>

Achieving better outcomes for patients through patient-provider concordance requires having a health workforce that reflects the diversity of the patient population. An area of longstanding concern has been the lack of racial and ethnic diversity in high-skilled (defined by education requirement) health care occupations, including physicians and nurses.<sup>11–13</sup> Racial and ethnic diversity exists, however, among low-skilled health care occupations, such as nursing assistants and home health aides, which are often associated with low pay.<sup>14</sup> Lack of diversity in high-skilled versus low-skilled jobs is not unique to health care, and studies suggest that low wages signal a lack of investment in certain worker populations that could serve as a barrier to moving up the career ladder.<sup>15</sup> Wages influence career decisions, including in health care, and low wages have been linked to job dissatisfaction and intent to leave.<sup>16–18</sup>

Prior studies have focused on wage disparities by race and ethnicity within high-skilled health care occupations, such as physicians, physician assistants (PAs), and nurses, in

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effort to understand the factors contributing to the lack of diversity within those professions. According to one study, race was not an explanatory factor for wage differentials among physicians.<sup>19</sup> The results have been mixed among PAs with one national study finding no wage disparities by race while another national study finding that Black and Hispanic PAs lagged behind their White counterparts.<sup>20,21</sup> Among a sample of registered nurses (RNs) working in hospitals, Black and Hispanic RNs made less than White RNs, and Asian RNs earned the most.<sup>22</sup>

A gap in the literature is whether wage disparities exist by race and ethnicity within low-skilled health care occupations and how they compare across the skill spectrum, which this study aims to address. One descriptive analysis suggests that wage disparities exist by race and ethnicity among low-skilled jobs where pay is low: nearly half of Black, Latina, and “other” female health care workers earned <\$15 per hour compared about a quarter of White and Asian female health care workers, but the study did not separate out occupations.<sup>22</sup> This study compares wage gaps, where they exist, across multiple occupations using a nationally representative dataset and applying a common wage decomposition method from the labor economics literature developed by Blinder and Oaxaca to identify factors contributing to wage gaps.<sup>23,24</sup> An additional contribution to the literature, this study examines multiple racial pairings such that White health care workers are not the only reference group. This study includes comparisons between Black and Asian health care workers, for example, which are growing segments of the health workforce and often well-represented in certain occupations such as RNs, nursing assistants, or home health aides.<sup>25–27</sup> Providing this holistic view of occupations may inform where in the pipeline health care is losing diversity in its workforce and support the development of targeted solutions.

## METHODS

### Data and Sample

This study pooled 2011–2018 data from the Current Population Survey (CPS), a nationally representative monthly survey of ~60,000 jointly collected by the Bureau of Labor Statistics and US Census Bureau. The year 2011 was chosen as the start date to ensure consistency in occupation codes across subsequent years. We used the Annual Social and Economic Supplement (also known as the March Supplement), which provides detailed data on wages and income, job characteristics, and sociodemographic characteristics, as well as information on an individual’s occupation and industry. The data were extracted from IPUMS.<sup>28</sup>

Our sample included employed individuals 18 years or older working in health care occupations defined by Census occupation codes. We grouped 52 occupation codes into 9 categories based on similarity in title, education, and skill (see Appendix Table A for details, Supplemental Digital Content 1, <http://links.lww.com/MLR/C303>): (1) physician; (2) advanced practitioner (eg, dentists, pharmacists, physician assistants); (3) advanced practice registered nurse (APRN); (4) RN; (5) licensed practical nurse/licensed vocational nurse

(LPN/LVN); (6) aide/assistant; (7) therapist; (8) technician/technologist (Tech); and (9) community-based worker (eg, social workers, counselors) (CBW). We categorized individuals into 1 of 5 racial categories as defined by CPS: (1) White; (2) Black; (3) Asian/Pacific Islander (API); (4) American Indian/Alaska Native (AIAN); or (5) multiracial. Individuals were also categorized by ethnicity: Hispanic or not Hispanic. Our unweighted sample included 76,606 respondents working in 1 of the 9 health care occupations representing 140,871,294 individuals when weighted.

### Measures

Our outcome measure was an individual’s self-reported annual pretax wage and salary income (referred heretofore as wages) received within the prior calendar year. Wages were converted to 2018 dollars based on the Consumer Price Index and logged to reduce the influence of outliers.<sup>29</sup> We used binary variables to control for factors that could influence wages including self-identifying as female, being born outside of the United States, having less than a baccalaureate degree as their highest degree, being married, having a child under 5 years old in the household, and living in a metro area. We had a categorical variable for whether the individual worked in 1 of 4 sectors defined by Census industry codes: (1) hospital; (2) ambulatory care (eg, physician offices, outpatient care); (3) long-term care (eg, skilled nursing facilities, home health); and (4) other (including nonhealth care settings). We included continuous variables controlling for the usual hours worked per week, age, and a quadratic term for age given extensive research suggesting a nonlinear relationship between age and wage.<sup>30</sup> We also included year dummies.

### Analysis

Descriptive sociodemographic characteristics were calculated within each health care occupation and wages were calculated by race/ethnicity and occupation. We used the Blinder-Oaxaca decomposition method to identify the significant differences in wages and the factors contributing to those difference between race/ethnic groups within each occupation. While extensive literature exists describing the Blinder-Oaxaca method,<sup>31</sup> briefly, we used a 2-fold method to identify the explained and unexplained portion of a wage gap between 2 defined groups (eg, White physicians versus Black physicians) based on a set of observable characteristics. The wage gap is defined as the difference in predicted wages for each group. The explained portion of the gap is the difference between the wages predicted for Black physicians based on their own characteristics versus the wages predicted for Black physicians assuming they had the same attributes as White physicians. For example, Black physicians may be younger with fewer years of experience than White physicians, so the Blinder-Oaxaca method estimates wages assuming Black physicians had the same age distribution as among the White physicians in the sample. The remaining portion of the wage differential is referred to as the “unexplained” portion and is often interpreted as an indicator of discrimination. A variation on the 2-fold model is the 3-fold model that further disaggregates the discrimination factor attributable to each

group. The “oaxaca” command in Stata version 15.1 was used to conduct these analyses, which assumes a pooled sample model with group specific indicators to prevent overstating the effect of the observed values and thus reducing omitted variable bias.<sup>32,33</sup>

For our analysis, we examined multiple race pairs: (1) White versus Black; (2) White versus API; (3) White versus AIAN; (4) White versus multiracial; (5) API versus Black; (6) API versus AIAN; (7) API versus multiracial; (8) Black versus AIAN; (9) Black versus multiracial; and (10) AIAN versus multiracial. In these models, we included a control variable for whether an individual was Hispanic. We also compared Hispanics versus non-Hispanics; this model included a control variable for an individual being in 1 of the 5 racial categories.

We used the Blinder-Oaxaca method to estimate wage gaps, the wage amount that is explained versus unexplained, and the factors that significantly contributed to the wage gap for each of the race and ethnicity pairs as well as across our 9 occupations. We reported significance at  $P \leq 0.05$ ,  $\leq 0.01$ , and  $\leq 0.001$ . All analyses used survey weights for generalizability.

## RESULTS

### Characteristics of the Health Workforce

In our pooled weighted sample of 140,871,294 over 8 years, 6.1% were physicians, 9.6% were advanced practitioners, 1.1% were APRNs, 18.4% were RNs, 3.7% were LPNs/LVNs, 27.8% were aides/assistants, 3.7% were therapists, 13.4% were techs, and 16.2% were CBWs (Table 1). The overall sample was 73.3% White, 16.4% Black, 7.8% API, 0.9% AIAN, and 1.6%

multiracial. Regarding ethnicity, 11.3% identified as Hispanic with the remaining 88.7% not identifying as Hispanic. About 15% of the sample were not born in the United States, with 10.3% being naturalized citizens and 5.4% not US citizens. Over three-fourths of the sample identified as female. The average age of the sample was 42.5 years old. Over half were married and about 15% had at least one child in the household under the age of 5 years old. Most of the sample lived in a metropolitan area. About half the sample held below a bachelor’s degree, with distribution of education relatively aligned by requirements of the occupation (note that education is self-reported, which may contribute to seemingly inconsistent findings).

Several characteristics varied considerably across health care occupations. Over 80% of advanced practitioners, APRNs, and therapists were White. LPNs/LVNs and aides/assistants had the highest percentage of non-Whites with over a quarter of its workers being Black. Physicians had the highest percentage of API at 20.4%, which was twice the representation as the next occupation—advanced practitioners. Hispanics had the most representation among aide/assistant occupations at 18.1% and least representation among APRN occupations at 4.3%. Physicians had the highest percentage of immigrants (20.3% naturalized and 8.3% not a US citizen) followed by aides/assistants (11.6% naturalized and 9.6% not a US citizen). In our sample, females represented only 38.4% of the physicians responding to the survey while females were nearly 90% of RNs and LPNs/LVNs. Age was relatively similar across the sample with physicians being among the oldest at 46.3 years old and techs being the youngest at 40.1 years old. Physicians and APRNs were most

**TABLE 1.** Sociodemographic and Work Characteristics by Health Care Occupation, Pooled 2011–2018

Characteristics	All	Advanced								
		Physician	Practitioner	APRN	RN	LPN/LVN	Aide/Assistant	Therapist	Tech	CBW
Unweighted sample size	76,606	4601	7384	832	14,227	2820	21,000	2726	9984	13,032
Weighted sample size (thousands)	140,871	8660	13,677	1533	26,140	5269	38,483	5170	18,955	22,984
Race (%)										
White	73.4	72.0	82.9	84.0	77.8	65.0	63.3	81.0	78.6	75.7
Black	16.3	6.2	6.1	8.3	11.6	27.2	26.8	8.5	11.6	17.8
Asian/Pacific Island	7.8	20.2	9.8	6.4	9.0	5.1	6.6	7.6	7.3	4.0
American Indian/Alaska Native	0.9	0.3	0.3	0.1	0.6	1.1	1.4	0.7	0.7	1.0
Multiracial	1.5	1.3	0.9	1.3	1.0	1.6	2.0	2.2	1.9	1.5
Hispanic (%)	11.1	5.7	5.9	4.3	6.7	10.8	17.9	9.2	11.4	10.7
Immigrant status (%)										
Native born	84.3	71.4	87.4	88.9	85.0	85.3	78.8	88.1	88.0	91.0
Naturalized	10.4	20.4	9.2	10.0	11.4	9.7	11.8	6.9	8.2	6.6
Not US citizen	5.4	8.2	3.3	1.1	3.6	5.0	9.5	5.0	3.8	2.4
Female (%)	78.3	38.4	66.2	85.6	90.1	89.9	87.5	77.4	71.8	73.8
Age (y)	42.7	46.3	44.0	45.4	43.7	43.1	40.9	41.5	40.3	44.3
Married (%)	56.4	76.2	68.6	77.0	63.9	52.1	41.9	54.1	55.4	58.5
Has a child under (%)	14.9	19.2	17.9	22.2	15.0	13.9	13.9	12.9	14.8	13.1
Lives in a metro area (%)	85.8	94.4	89.8	86.5	85.8	79.3	82.9	86.6	85.5	86.7
Educational degree (%)										
High school or below	17.4	0.5	3.0	1.5	1.4	20.7	44.5	9.3	16.2	8.0
Post-secondary/associate	33.3	1.5	6.0	2.9	35.6	70.6	44.2	40.4	51.3	17.7
Bachelor’s	25.1	2.1	20.3	4.1	53.3	6.7	9.2	26.6	26.6	35.5
Master’s and above	24.2	95.9	70.7	91.6	9.7	2.0	2.1	23.7	5.9	38.8
Part-time (%)	21.2	8.0	23.1	19.6	18.6	19.2	30.3	32.6	19.6	12.2
Usual hours worked per week (#)	38.5	50.4	37.9	39.3	37.6	38.1	36.0	34.7	38.6	40.3

APRN indicates advanced practice registered nurse; CBW, community-based worker; LPN/LVN, licensed practical nurse/licensed vocational nurse; RN, registered nurse; Tech, technician/technologist.

likely to be married (76.1% and 76.7%, respectively) while aides/assistants were least likely to be married at 41.5%. There was little variation in the percent that lived in a metropolitan area.

### Hours Worked and Average Annual Wages

The average usual hours worked per week was 38.5 hours, ranging from 35 to 40 hours of work per week, which is often defined as full-time work. About one-fifth of the sample worked part-time, defined as 35 hours or less per week (Table 1).<sup>34</sup> Physicians reported working the most hours at about 50 hours per week usually and the lowest percentage working part-time at 8.0%. Therapists had the lowest hours per week (34.7 h) and the highest percentage working part-time (32.6%).

Annual wages averaged \$56,695 with a wide range from as high as \$181,304 among physicians to as low as \$24,909 among aides/assistants, an over 7-fold difference (Table 2). Generally, wages were higher among occupations

with higher education requirements. Average annual wages varied considerably across race and ethnicity with API health care workers having the highest average annual wage at \$76,959 and AIAN workers having the lowest at \$40,399. White workers and non-Hispanic workers were nearly on par due to the high degree of overlap in the number of people self-identifying with each of these characteristics. Although wage gaps between races remained consistent over time with API health care workers in aggregate making the highest wage on average per year (Appendix Figure A, Supplemental Digital Content 2, <http://links.lww.com/MLR/C304>), wages by race/ethnicity varied within occupations. For example, API workers were not the highest earners among physicians or advanced practitioners. Multiracial workers reported the lowest annual wages for 5 out of the 9 occupations (physicians, advanced practitioners, LPNs/LVNs, aides/assistants, and CBWs) while AIANs reported the lowest annual wages for 3 out of the 9 (RNs, therapists, and techs).

**TABLE 2.** Average Annual Wages by Race/Ethnicity and Health Care Occupation, Pooled 2011–2018

Occupation	Ethnicity				Race			
	All Races/ Ethnicities	Non-Hispanic	Hispanic	White	Black	Asian/Pacific Islander	American Indian/ Alaska Native	Multiracial
All health care occupations	\$56,695 SE: \$377 N = 140,871,294	\$58,388 SE: \$407 N = 125,212,905	\$43,156 SE: \$753 N = 15,658,388	\$58,148 SE: \$441 N = 103,449,634	\$42,295 SE: \$655 N = 22,986,489	\$76,959 SE: \$1702 N = 11,033,431	\$40,399 SE: \$1833 N = 1,228,676	\$46,183 SE: \$2206 N = 2,173,064
Physician	\$181,304 SE: \$3563 N = 8,660,965	\$182,324 SE: \$3630 N = 8,164,141	\$164,549 SE: \$13,023 N = 496,824	\$186,294 SE: \$4543 N = 6,237,760	\$173,580 SE: \$14,821 N = 535,856	\$169,208 SE: \$5845 N = 1,748,104	\$152,056 SE: \$20,495 N = 27,654	\$136,215 SE: \$21,510 N = 111,591
Advanced practitioner	\$83,467 SE: \$1477 N = 13,677,023	\$83,554 SE: \$1464 N = 12,867,645	\$82,085 SE: \$6689 N = 809,379	\$82,270 SE: \$1684 N = 11,343,895	\$76,864 SE: \$6216 N = 832,045	\$98,219 SE: \$3506 N = 1,336,352	\$92,047 SE: \$12,359 N = 44,275	\$74,911 SE: \$7434 N = 120,457
Advanced practice registered nurse	\$90,076 SE: \$3236 N = 1,532,742	\$90,520 SE: \$3350 N = 1,467,164	\$80,139 SE: \$11,794 N = 65,578	\$92,110 SE: \$3715 N = 1,286,828	\$71,131 SE: \$5762 N = 127,654	\$86,792 SE: \$8319 N = 97,270	\$89,356 SE: NA* N = 1686	\$96,397 SE: \$24,121 N = 19,305
Registered nurse	\$63,283 SE: \$486 N = 26,139,782	\$63,330 SE: \$498 N = 24,399,224	\$62,629 SE: \$1689 N = 1,740,558	\$61,765 SE: \$494 N = 20,332,041	\$60,854 SE: \$979 N = 3,037,409	\$78,741 SE: \$2928 N = 2,357,205	\$55,814 SE: \$3370 N = 153,926	\$74,706 SE: \$9904 N = 259,201
Licensed practical nurses/ licensed vocational nurse	\$40,557 SE: \$1555 N = 5,268,830	\$41,150 SE: \$1746 N = 4,699,368	\$35,662 SE: \$1394 N = 569,462	\$40,560 SE: \$2266 N = 3,423,275	\$39,039 SE: \$1002 N = 1,432,346	\$51,880 SE: \$10,296 N = 268,497	\$37,359 SE: \$3116 N = 58,484	\$32,570 SE: \$2529 N = 86,227
Aide/assistant	\$24,909 SE: \$217 N = 38,482,761	\$25,170 SE: \$237 N = 31,594,196	\$23,716 SE: \$471 N = 6,888,565	\$24,809 SE: \$265 N = 24,349,841	\$24,775 SE: \$411 N = 10,306,628	\$26,934 SE: \$900 N = 2,532,119	\$24,523 SE: \$2638 N = 532,653	\$23,491 SE: \$1196 N = 761,521
Therapist	\$39,862 SE: \$873 N = 5,170,356	\$39,953 SE: \$947 N = 4,695,495	\$38,959 SE: \$1748 N = 474,862	\$38,860 SE: \$875 N = 4,186,833	\$44,123 SE: \$2623 N = 439,391	\$48,361 SE: \$5496 N = 392,535	\$32,173 SE: \$9981 N = 36,769	\$33,488 SE: \$4068 N = 114,828
Technician/ technologist	\$44,284 SE: \$527 N = 18,954,857	\$44,680 SE: \$518 N = 31,594,196	\$41,202 SE: \$1385 N = 2,159,018	\$44,236 SE: \$557 N = 14,893,105	\$43,890 SE: \$2009 N = 2,194,802	\$47,326 SE: \$1562 N = 1,378,058	\$35,606 SE: \$2186 N = 138,810	\$40,235 SE: \$2273 N = 350,082
Community-based worker	\$55,030 SE: \$553 N = 22,983,975	\$55,658 SE: \$614 N = 20,529,833	\$49,778 SE: \$1338 N = 2,454,142	\$56,407 SE: \$670 N = 17,396,055	\$47,627 SE: \$800 N = 4,080,359	\$66,814 SE: \$3820 N = 923,291	\$47,961 SE: \$2400 N = 234,418	\$46,540 SE: \$3188 N = 349,852

\*Unweighted sample includes only 1 observation.  
Wages adjusted for consumer price index to 2018 prices.

**TABLE 3.** Wage Decomposition by Race/Ethnicity and Health Care Occupation (Non-Hispanic and White as Reference Group)

Occupation	Non-Hispanic Compared With			White Compared With	
	Hispanic†	Black	Asian/Pacific Islander	American Indian/Alaska Native‡	Multiracial§
Physician					
Wage gap	\$13,414	\$23,889*	\$14,892*	\$20,216	\$54,746*
Explained	\$7313	\$14,703*	\$16,088***	\$19,967	\$43,716*
Unexplained	\$6101	\$9186	-\$1196	\$248	\$11,031
Advanced practitioner					
Wage gap	\$60	\$8658*	-\$14,580***	-\$15,290	\$923
Explained	\$874	\$3149	-\$4154	\$20	-\$386
Unexplained	-\$813	\$5,508	-\$10,425**	-\$15,309	-\$149,723
Advanced practice registered nurse					
Wage gap	-\$609	\$13,703*	\$1647	NA	\$1644
Explained	\$7466	\$7721	\$17,035		-\$2768
Unexplained	-\$8075	\$5982	-\$15,388		\$4412
Registered nurse					
Wage gap	\$3247	-\$173	-\$11,497***	\$1386	\$1934
Explained	-\$311	-\$4627***	-\$6856***	-\$1547	\$1948
Unexplained	\$3558*	\$4454**	-\$4640*	\$2932	-\$14
Licensed professional nurse/licensed vocational nurse					
Wage gap	\$3860*	\$843	-\$5449*	\$2071	\$3325
Explained	\$692	-\$2861**	-\$3071	-\$555	\$4196
Unexplained	\$3168*	\$3704**	-\$2378	\$2626	\$1255
Aide/assistant					
Wage gap	\$915**	-\$181	-\$1447*	\$2310	\$1666
Explained	-\$435	-\$1083***	-\$1453***	\$1030	\$267
Unexplained	\$1350***	\$903**	\$6	\$1280	\$1399
Therapist					
Wage gap	\$819	\$1226	-\$2541	\$7032	\$6958
Explained	\$3950	-\$1287	-\$902	\$4681*	\$5211
Unexplained	-\$3130	\$2513	-\$1640	\$2351	\$1748
Technician/technologist					
Wage gap	\$3211**	\$1733	-\$2516	\$5626*	\$2172
Explained	\$3561***	-\$586	-\$4240**	-\$1907	\$2606*
Unexplained	-\$350	\$2320*	\$1724	\$7532***	-\$434
Community-based worker					
Wage gap	\$5571***	\$5257***	-\$2825	\$1982	\$8304*
Explained	\$5380***	\$1864**	-\$984	\$4976***	\$359
Unexplained	\$191	\$3401***	-\$1841	-\$2994	\$7945**

Except as noted, models include binary variables for being female, not being born in the U.S., having less than a Baccalaureate as the highest degree, being married, having a child under 5 in the household, living in a metro area; categorical variable for health care sector: hospital [reference], ambulatory care, long-term care, and other; continuous variables of age, age squared, and usual hours of work; and year dummies. In models comparing racial groups, a binary variable for being Hispanic was included. Non-Hispanic versus Hispanic model included race categories as control variables: White [reference], Black, Asian/Pacific Islander, American Indian/Alaska Native, and Multiracial.

†Advanced Practice Registered Nurse model does not expand race categories.

‡Physician model excludes having less than a Baccalaureate and does not expand categories for health care sector or years; Advanced Practitioner model does not expand health care sector categories; Advanced Practice Registered Nurse model excludes living in a metro area; Therapist model excludes not being born in US, having less than a Baccalaureate, and health care sector, and does not expand categories for years.

§Physician model does not expand categories for health care sector; Advanced Practice Registered Nurse excludes Hispanic and not US born and does not expand categories for health care sector or years; therapist model excludes not being born in US, having less than a Baccalaureate, and living in a metro area and does not expand categories for health care sector or years.

NA indicates data not available.

\*P ≤ 0.05.

\*\*P ≤ 0.01.

\*\*\*P ≤ 0.001.

### Explaining Variation in Average Annual Wages

All professions except therapists had at least 1 race/ethnicity pair with a significant wage gap (Tables 3, 4). Among physicians, White physicians had significantly higher wages than Black (\$23,889), API (\$14,892), or multiracial (\$54,746) physicians. Observable factors such as differences in sex, age, and marital status significantly explained most of the wage gap (Appendix Table B, Supplemental Digital Content 3, <http://links.lww.com/MLR/C305>). Among advanced practitioners, API advanced practitioners made significantly more than White (\$14,580) and Black advanced practitioners (\$23,237), and White and AIAN

advanced practitioners made significantly more than Black advanced practitioners (\$8658 and \$23,947, respectively). The gap between AIAN and Black advanced practitioners is mostly explained by measured factors, notably the distribution of Hispanics (as indicated by the negative sign among the significantly contributing explained factors in Appendix Table C, Supplemental Digital Content 4, <http://links.lww.com/MLR/C306>). Most of the gap between White versus API advanced practitioners as well as Black versus API advanced practitioners was unexplained by the included measures in the study, although advancing age may have been a contributing factor for the difference between Black versus

**TABLE 4.** Wage Decomposition by Race/Ethnicity and Health Care Occupation (Asian/Pacific Islander, Black, and American Indian/Alaska Native as Reference Group)

Occupation	Asian/Pacific Islander Compared With			Black Compared With		American Indian/Alaska Native Compared With
	Black	American Indian/Alaska Native†	Multiracial‡	American Indian/Alaska Native†	Multiracial‡	Multiracial‡
<b>Physician</b>						
Wage gap	\$8997	\$6,782	\$39,854	−\$2,885	\$30,858	\$32,917
Explained	−\$4,472	−\$10,708	\$21,526	−\$4,066	\$24,880	\$64,147
Unexplained	\$13,469	\$17,544	\$18,329	\$1,181	\$5,978	−\$31,230
<b>Advanced practitioner</b>						
Wage gap	\$23,237***	−\$710	\$15,503	−\$23,947*	−\$7735	\$16,213
Explained	\$7558	\$4600	\$4527	−\$20,562*	−\$212	\$1853
Unexplained	\$15,679***	−\$5310	\$10,975	−\$3385	−\$7522	\$14,360
<b>Advanced practice registered nurse</b>						
Wage gap	\$12,056	NA	−\$223	NA	−\$15,262	NA
Explained	−\$17,706		−\$12,219		−\$9,216	
Unexplained	\$29,762***		\$11,996		−\$6,046	
<b>Registered nurse</b>						
Wage gap	\$11,324***	\$12,882*	\$13,431*	\$1558	\$2107	\$549
Explained	\$1099	\$1757	\$5385	\$1156	\$4561	\$6892
Unexplained	\$10,225***	\$11,125	\$8,046	\$402	−\$2454	−\$6343
<b>Licensed professional nurse/licensed vocational nurse</b>						
Wage gap	\$6291*	\$7520	\$11,114*	\$1228	\$4823	\$3594
Explained	\$309	\$1633	\$2595	\$1582	\$4640*	\$8130
Unexplained	\$5983*	\$5887	\$8520	−\$353	\$182	−\$4535
<b>Aide/assistant</b>						
Wage gap	\$1266	\$3757*	\$3113*	\$2491	\$1847	−\$644
Explained	\$142	\$961	\$1997	\$1678	\$1404	−\$71
Unexplained	\$1124	\$2796*	\$1116	\$813	\$443	−\$573
<b>Therapist</b>						
Wage gap	\$3767	\$8823	\$8749	\$6774	\$6700	−\$74
Explained	\$4581	\$16,035	\$6346	−\$49	\$8183	−\$1673
Unexplained	−\$814	−\$7212	\$2404	\$6951	−\$1484	\$1599
<b>Technician/technologist</b>						
Wage gap	\$4249*	\$8142**	\$4689	\$3893	\$439	−\$3453
Explained	\$4275**	−\$2028	\$6025**	−\$1443	\$2007	\$6616
Unexplained	−\$25	\$10,170**	−\$1337	\$5336	−\$1568	−\$10,069
<b>Community-based worker</b>						
Wage gap	\$8092***	\$4808	\$11,130*	−\$3284	\$3038	\$6322
Explained	\$2757*	\$5967*	\$397	\$2294	−\$1101	−\$4439
Unexplained	\$5335*	−\$1160	\$10,733**	−\$5578*	\$4139	\$10,761

Except as noted, models include binary variables for being female, not being born in the United States, having less than a Baccalaureate as the highest degree, being married, having a child under 5 in the household, living in a metro area; categorical variable for health care sector: hospital [reference], ambulatory care, long-term care, and other; continuous variables of age, age squared, and usual hours of work; and year dummies. In models comparing racial groups, a binary variable for being Hispanic was included. Non-Hispanic versus Hispanic model included race categories as control variables: White [reference], Black, Asian/Pacific Islander, American Indian/Alaska Native, and Multiracial.

†Physician model excludes having less than a Baccalaureate and does not expand categories for health care sector or years; Advanced Practitioner model does not expand health care sector categories; Advanced Practice Registered Nurse model excludes living in a metro area; Therapist model excludes not being born in US, having less than a Baccalaureate, and health care sector, and does not expand categories for years.

‡Physician model does not expand categories for health care sector; Advanced Practice Registered Nurse excludes Hispanic, not US born, having less than a Baccalaureate, and living in a metro area, and does not expand categories for health care sector or years; Registered Nurse model does not expand health care sector categories; Therapist model excludes not being born in US, having less than a Baccalaureate, and living in a metro area and does not expand categories for health care sector or years.

NA indicates data not available.

\* $P \leq 0.05$ .

\*\* $P \leq 0.01$ .

\*\*\* $P \leq 0.001$ .

API advanced practitioners (as indicated by the positive sign on age squared among the unexplained variables in Appendix Table C, Supplemental Digital Content 4, <http://links.lww.com/MLR/C306>). The difference between White and Black advanced practitioners was not attributable to any of the factors measured in this study.

Among nursing professions, White APRNs made significantly more than Black APRNs (\$13,703) due to factors not otherwise measured in the study. The wage gap between

API and Black APRNs was not significant. Among RNs, APIs made significantly more (\$11,497) than Whites, about half (\$6856) of which was explained by differences in observable attributes of self-identifying as female, having less than a bachelor's degree, working more hours per week, living in a metro area, and working in a non-health care sector widening the wage gap. API RNs also made significantly more than Black (\$11,324), AIAN (\$12,882), and Multiracial (\$13,431) RNs, which were largely unexplained or could not

be determined by factors included in the study. Although Black RNs could have made significantly more than White RNs, the difference was negated by unexplained factors.

Among LPNs/LVNs, Non-Hispanics made significantly more than Hispanics (\$3860), and APIs made more than White (\$5449), Black (\$6291), and Multiracial (\$11,114) individuals, with differences largely unexplained or not able to be determined by factors included in the study. Similar to RNs, Black LPNs/LVNs could have made significantly more than White LPNs/LVNs, but the difference was negated by unexplained factors. Among aides/assistants, non-Hispanics made significantly more than Hispanics (\$915), and APIs made significantly more than White (\$14,147), AIAN (\$3757), and multiracial (\$3113) individuals. While the difference between White and API aides/assistants were largely explained by observed factors, the significant difference among the other pairs were largely unexplained or could not be determined by measured factors. Again, any gains that Black aides/assistants could have made over White aides/assistants were negated by unexplained factors.

As mentioned earlier, there were no significant wage gaps among therapists; White therapists potentially could have made significantly more than AIAN therapists based on observed factors, but the significance did not appear at the aggregated level. Among techs, non-Hispanics made significantly more than Hispanics (\$3211), and APIs made more than Blacks, both mostly explained by differences in observed attributes. White and API techs made significantly more than AIAN techs (\$5626 and \$8142, respectively), though most of the wage gap remained unexplained. Among CBWs, non-Hispanics made significantly more than Hispanics (\$5571); Whites and APIs made significantly more than Black (\$5275 and \$8092, respectively) and Multiracial (\$8304 and \$11,130, respectively) individuals. The wage gap was largely explained by observed factors between non-Hispanics and Hispanics, but largely unexplained between Whites and APIs versus multiracial individuals. The wage gap between Whites and APIs versus Blacks were each about one-third explained by observed factors with the remaining two-thirds unexplained.

## DISCUSSION

Our study found wage gaps that persisted across certain race/ethnic group pairs and across the health professions other than therapists. Notably, no significant wage gaps were identified between multiracial and Black health care workers across occupations, and similarly between multiracial and AIAN workers. Where wage gaps existed, being female, older, and having higher education were often common contributors to expanding wage gaps, which is consistent with other studies of the health professions.<sup>19–21,34–38</sup>

While a blunt categorization of ethnicity, our study found non-Hispanics consistently made more than Hispanics among LPN/LVN, aide/assistant, tech, and CBW occupations. The majority of these workers had below a bachelor's degree, which reflects the general education requirement of these occupations. Wage gaps in these low-skilled jobs may be contributing to the lack of diversity at higher skilled occupations such as physicians, advanced practitioner, and RNs; Hispanic health care workers may be left without sufficient financial resources to

invest in furthering their education. Of those in the higher-skilled jobs, no significant wage gaps were identified.

APIs consistently made more than Black, AIAN, and multiracial individuals across occupations except physicians, advanced practitioners, or therapists where no significant wage gaps were found. APIs only made significantly less when compared to White physicians, but otherwise made more than White advanced practitioners, RNs, LPNs/LVNs, and aides/assistants with the remaining occupations having no significant wage gaps. There were, however, significant unexplained differences between APIs versus White and Black advanced practitioners and RNs, as well as versus Black LPNs/LVNs and CBWs. While some of the unexplained variation was related to age (ie, advancing age was related to larger wage gaps beyond what would otherwise be predicted), the variation appeared to be due to unmeasured factors in the study. Despite the relatively large role of immigrants in these jobs, particularly from the Philippines among RNs, immigration status did not appear as a significant factor. Warranting further investigation are attributes not measured in this study (eg, quality of education, soft skills) that may be translating to higher wages. This study raises questions as to whether API should be considered as a reference group rather than or in addition to White, which is a common comparator in health workforce analyses, to improve our understanding of where differences exist between race groups.

For Black RNs, LPNs/LVNs, and aides/assistants, based on measured attributes such as sex, age, and education, the regression model predicted they would make more than their White peers. Unexplained variation, however, negated these gains and this study provided limited insight as to which attributes were contributing to the unexplained variation. The finding is consistent with another wage decomposition study of hospital-based RNs.<sup>22</sup> As described earlier, the unexplained variation is often interpreted as a measure of discrimination and the finding support studies describing the discrimination that Black nurses face in the hiring process as the quality of their education and experience are questioned.<sup>39</sup> Discrimination against Black nurses including nursing assistants in the workplace may lead to fewer promotions and opportunities for career advancement than their White peers, which would otherwise translate to higher wages.<sup>40</sup>

Among the study's limitations, we did not address selection into these occupations to start, which could otherwise bias the sample particularly in higher-skilled occupations that have greater barriers to entry such as cost and length of education. Several factors that may influence wage were not available in our data including quality of education, the nature of the work being conducted (including the complexity of the roles and tasks), or detailed work setting. Also, race and ethnicity are social constructs that do not fully capture an individual's life experience that may influence wages.<sup>41</sup> We did not capture any income from self-employment or revenue from being a business stakeholder, which may be common among higher-skilled occupations such as physicians or therapists. We also did not know what portion of wages came from what job for multiple job holders, which may be a concern among lower-skilled occupations such as aides/assistants.

Despite these limitations, our study points to areas where further work is needed to understand wage disparities and the extent to which structural racism may be a contributing factor. Addressing wage disparities is important if our society aims to

improve workforce diversity among higher-skilled jobs. Consistently undervaluing Hispanic, Black, AIAN, and multiracial health care workers diminishes their opportunities to move up the health career ladder by making it difficult to afford tuition to get an advanced degree. Also, low wage is accompanied by being in poverty and having lack of access to benefits such as health insurance and sick leave even when working full-time.<sup>42,43</sup> Unaddressed health problems and work disabilities as well as job dissatisfaction can contribute to turnover, which hurts the diversity of the health workforce pipeline.<sup>13,44</sup> Our study suggests that wage disparities are pervasive in health care across the skill spectrum, which can threaten the health system's ability to deliver high quality care that patients expect and deserve.

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