

# Making a Living in Governmental Public Health: Variation in Earnings by Employee Characteristics and Work Setting

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## ABSTRACT

**Context:** This article examines factors related to earnings in the context of the governmental public health system's urgent need to recruit and retain trained public health workers as many in the existing workforce move toward retirement.

**Methods:** This article characterizes annualized earnings from state and local public health practitioners in 2017, using data from the 2017 Public Health Workforce Interests and Needs Survey (PH WINS), which was fielded in fall/winter 2017 to more than 100 000 state and local public health practitioners in the United States. The response consisted of 47 604 public health workers for a response rate of 48%.

We performed descriptive statistics, bivariate analyses, and interval-based regression techniques to explore relationships between annualized earnings, supervisory status, gender, years of experience, highest degree (and whether it was a public health degree), job classification, race/ethnicity, union/bargaining unit, paid as salary or hourly wage, setting, and region.

**Results:** Higher supervisory status, higher educational attainment, white non-Hispanic race/ethnicity, male gender, salaried employment, bargaining unit (labor union) position, certain geographic regions, having a clinical/laboratory/other scientific position, and working in either a state health agency (SHA) or a large local health department (LHD) setting are all associated with higher salary. Having a public health degree versus a degree in another area did not appear to increase earnings. Being a person of color was associated with earning \$4000 less annually than white peers ( $P < .001$ ), all else being equal. The overall regression model showed a gender wage gap of about \$3000 for women ( $P = .018$ ). Supervisors, clinical and laboratory staff, public health sciences staff, and union staff also earned more than their counterparts.

**Discussion:** As multiple factors continue to shape the public health workforce, including increasing racial/ethnic diversity, continued retirements of baby boomers, and the growth of bachelor's-level public health education, researchers should continue to monitor the gender and racial/ethnic pay gaps. This information should help the field of governmental public health as it endeavors to rebuild its capacity while current workers, many at the highest level of leadership, move on to retirement or other jobs. Public health leaders must prioritize equitable pay across gender and race/ethnicity within their own departments as they build their organizations' capacity to achieve health equity.

**KEY WORDS:** PH WINS, public health departments, salary, workforce

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Thirty years ago, the Institute of Medicine (now the National Academy of Medicine) characterized the public health system as being in disarray, with alarmingly limited capacity to address the looming health threats on the horizon.<sup>1</sup> While there have been a number of efforts to strengthen the public health system's capacity, which consists mostly of its workers,<sup>2-14</sup> the governmental public health workforce continues to be challenged by the loss of positions, lack of formal public health training, and a high degree of anticipated turnover.<sup>15-17</sup> Salary is an important tool to address these challenges in the recruitment and retention of highly qualified workers.<sup>18-20</sup>

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A large portion of the state governmental public health workforce intends to leave governmental public health—42% in 2014 and 47% in 2017.<sup>21,22</sup> Local health departments (LHDs) are also facing a high level of anticipated turnover (41% in 2017).<sup>23</sup> Budgets were cut repeatedly over the last decade, limiting health departments' ability to offer competitive salaries and leading to decreased benefits.<sup>15,24</sup> Perhaps as a result, fewer than half of workers (48%) are satisfied with their pay, though this is similar to the level of pay satisfaction among public school teachers (45%).<sup>21,25</sup> Researchers have found that pay satisfaction is an important predictor of intent to leave.<sup>26-28</sup>

A key component of voluntary turnover is retirement. The average age of governmental public health workers has decreased since 2014, as has the proportion of workers planning to retire. But about a quarter of the workforce is eligible for retirement and 48% are age 50 years or older.<sup>21</sup> Governmental public health agencies have been able to recruit some younger workers<sup>29</sup> but will need to find many more to replace all the retirees.<sup>15,16</sup> Meanwhile, schools and programs of public health are conferring public health degrees in record numbers.<sup>15</sup> Bachelor's programs in public health graduated almost 11 000 students in 2015, a six-fold increase over graduation levels 10 years before. Master's graduates almost doubled during the same period to about 14 000 in 2015.<sup>15</sup>

Recent graduates may enter governmental public health if they believe that they can be satisfied by meaningful work and reliable, appropriate financial compensation. However, only 14% of the current governmental public health workforce has a public health degree at the bachelor's, master's, or doctoral level. This suggests that public health departments are not currently attracting public health graduates or are not seeking them.

Previous research has examined governmental public health salaries in various segments of the public health system: epidemiologists,<sup>30</sup> laboratory workers,<sup>31</sup> or employees in state health agencies (SHAs).<sup>32</sup> This article examines factors related to the salaries of governmental public health employees, across the entire spectrum of public health disciplines, and in different settings, including SHAs, small- to moderate-sized LHDs, and LHDs that are members of the Big City Health Coalition (BCHC). The findings are important in the context of the public health system's urgent need to recruit and retain trained public health workers as many in the existing workforce move toward retirement.

## Methods

This article characterizes annualized earnings from state and local public health practitioners in 2017. To

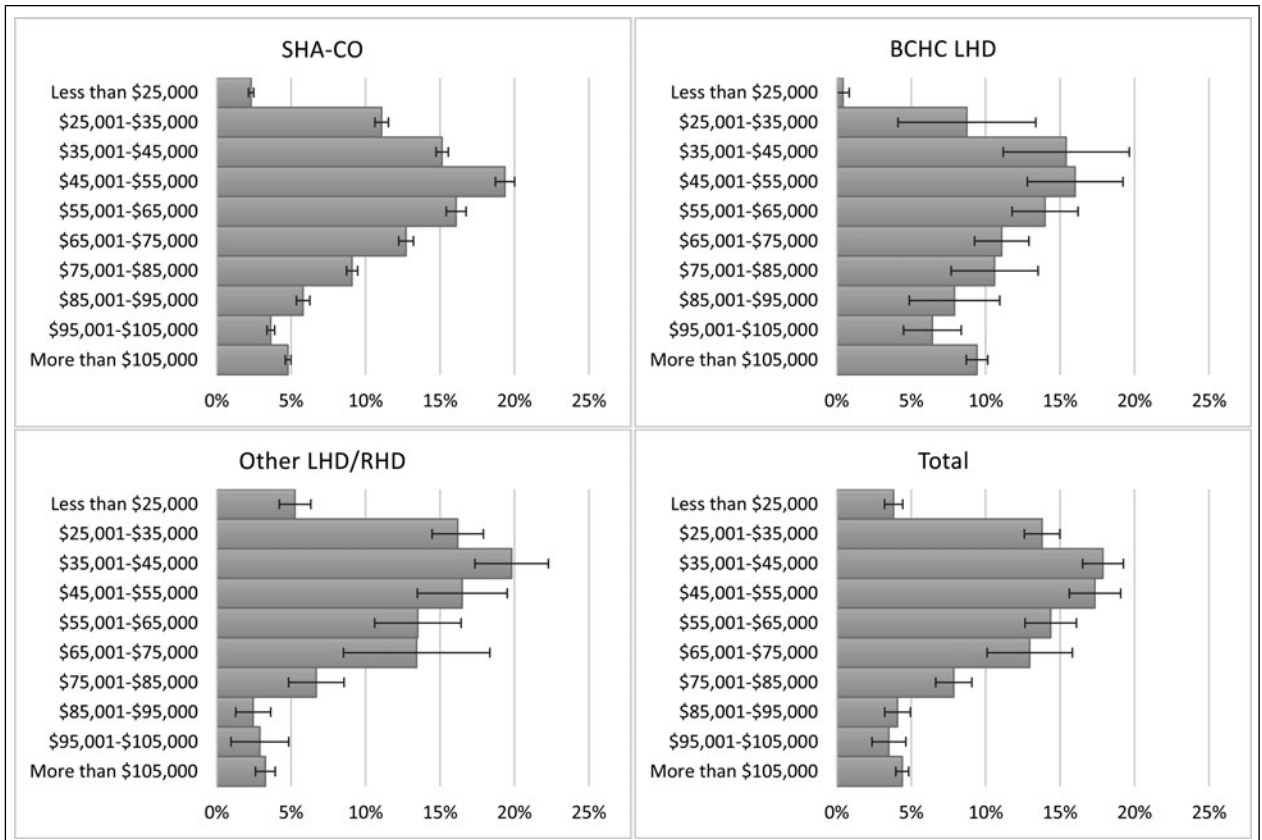
achieve this aim, we utilize data from the 2017 Public Health Workforce Interests and Needs Survey (PH WINS). The methodology of the survey has been outlined extensively elsewhere.<sup>33</sup> PH WINS was fielded in fall/winter 2017 to more than 100 000 state and local public health practitioners in the United States. There were two final frames: a state health agency-central office (SHA-CO) frame and a local health department (LHD) frame. The former involved participation from 47 SHAs across the 10 Health and Human Service Regions. The SHA-CO frame was fielded as a census in participating agencies and included 17 138 respondents. The LHD frame had a significantly more complex design and included 26 large LHDs that are members of the BCHC, as well 373 other LHDs.<sup>33</sup> Some participating agencies were contributed with certainty and some on a probability basis based on the specific sampling approach.<sup>33</sup> The frame is representative of LHDs that serve 25 000 people or more and have 25 or more staff but does not include smaller LHDs. Nonresponse and sampling adjustments were made and balanced repeated replication weights were employed. Overall, the nationally representative SHA-CO frame had a 35% response rate and the local frame had a 59% response rate. Overall, across all frames, the PH WINS had a 48% response rate, after adjusting for bad e-mail addresses and staff who were otherwise ineligible to participate (eg, they left their agency).

Data from both frames were employed in this analysis. To characterize differences in earnings across groups, we constructed an annualized earning estimate in line with previous work.<sup>32</sup> This involved ascertaining whether a respondent earned on the basis of hourly wages or a salary and then converting full-time hourly wage earners to annualized salaries (estimating 2000 h/y for full-time staff). More broadly, those who were not full-time (about 8% of total) were not included in this analysis. The respondents were asked to indicate their earnings in \$10 000 interval options (or their hourly equivalents), beginning at \$25 000 and ending at \$145 000. For certain analyses, we excluded outliers (the 5% earning less than \$25 000 and 1% earning more than \$145 000). An ancillary benefit of this approach is that it allows for the conversion of intervals to dollars for ease of reading and interpretation. Descriptive statistics were performed, as were bivariate analyses comparing earnings based on setting (ie, SHA, LHD, BCHC) and level of education. A regression model was constructed, extending a previous model with an improved interval-based regression,<sup>32</sup> regressing annualized earnings on supervisory status, gender, years of experience, highest degree (and whether it was a public health degree), job classification, race/ethnicity, union/bargaining unit, paid salary or hourly wage, setting, and region. These items have

been defined extensively elsewhere<sup>33</sup>; in brief, supervisory status related to whether the respondent was a nonsupervisor, supervisor, manager, or part of the executive service or equivalent. Job classification was generated from the Centers for Disease Control and Prevention-Michigan taxonomy of positions<sup>34</sup> and collapsed into administrative/clerical, public health sciences, clinical and laboratory, and social services and all other.<sup>35</sup> Setting was defined by whether the respondent worked in a SHA central office (SHA-CO), in a Big City Health Coalition LHD (BCHC LHD), or at another LHD. Model finalization occurred using Akaike information criterion/Bayesian information criterion and variance inflation factor analysis to examine collinearity. The model also utilizes the cost of living index,<sup>36</sup> a form of purchasing power adjustment to account for differential cost of living across the United States. The cost of living index was applied on the basis of the county location of the respondent's home agency. All data were managed and analyzed in Stata 15.1 (StataCorp LLC, College Station, Texas).

### Results

Annualized earnings among governmental public health practitioners vary considerably. Factors associated with earnings include individual characteristics—experience, position type, and degree—and characteristics of the geographic region, agency, and setting. Across all of these characteristics, the average salary in governmental public health ranges between \$55 000 and \$65 000. This varies considerably by setting (Figure 1), as well as region. The average salary at SHA-COs is \$55 000 to \$65 000; at BCHC LHDs, it is \$65 000 to \$75 000, and at other LHDs, it is \$45 000 to \$55 000. In total, it is estimated that 70% of the workforce earns \$65 000 or less, and about 5% of the workforce earns \$95 000 or more. Earnings vary regionally as well. Average earnings are between \$45 000 and \$55 000 for regions 3, 4, 6, 7, and 8 compared with \$55 000 to \$65 000 for regions 5 and 10. Average earnings are \$65 000 to \$75 000 for regions 1, 2, and 9.



**FIGURE 1** Annualized Earnings of Public Health Employees by Agency Setting<sup>a</sup>  
 Abbreviations: BCHC LHD, Big City Health Coalition local health department; LHD/RHD, local health department/regional health department; SHA-CO, State Health Agency-Central Office.  
<sup>a</sup>X-axis shows percentage of respondents who are within a particular group of annualized earnings. Capped bars represent 95% confidence intervals.

**Earnings by experience and educational attainment**

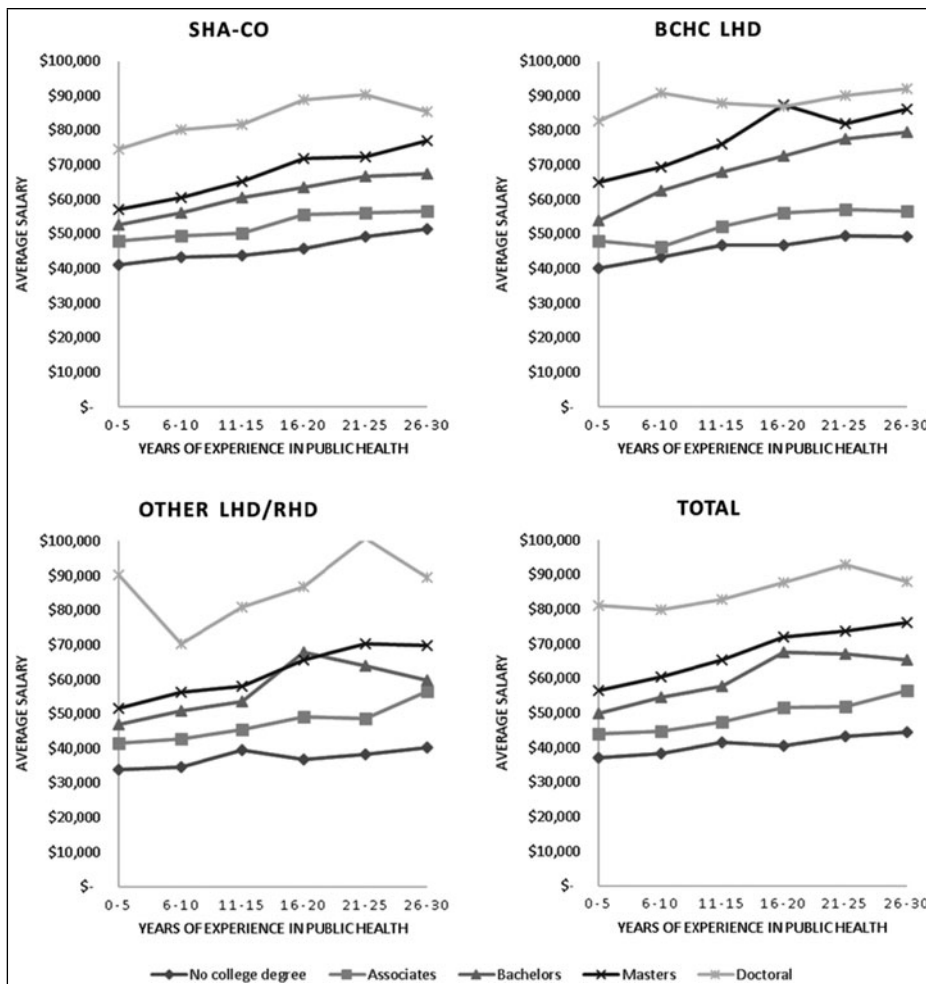
Annualized earnings increase with both years of experience and educational attainment on average (Figure 2). Compared with those earlier in their careers, staff with 15 or more years of experience make about \$13 000 more (95% confidence interval: \$11 000–\$15 000) on average. This varies by setting. The difference is about \$13 000 for SHA-CO staff on average, \$14 000 for BHC staff, and \$12 500 for other LHD staff.

Starting salary for SHA-CO staff and BHC LHD staff ranges between \$45 000 and \$55 000 on average, compared with \$35 000 and \$45 000 for other LHD/regional health department (RHD) staff. The data also suggest that starting salary may differ substantially by educational attainment, as shown in Figure 3. Among SHA-CO staff, compared with someone with no college degree, those starting with an associate’s degree start earning about

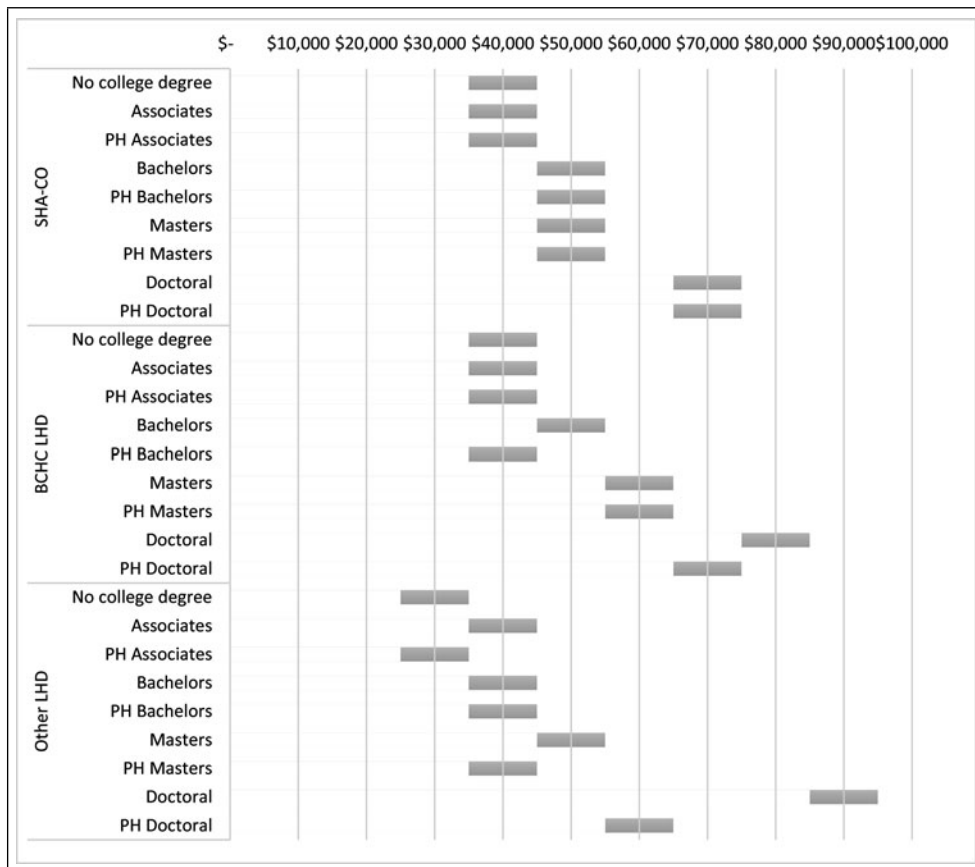
\$10 000 more, a respondent with a bachelor’s degree earned about \$15 000 more, a respondent with a master’s degree earned about \$20 000 more, and a respondent with a doctoral degree earned about \$45 000 more. In comparing earnings for those in practice for 5 years or less, there does not appear to be an earnings advantage to getting a public health degree versus a degree at a comparable level (eg MPH vs non-PH masters). As shown in Supplemental Digital Content Appendix Figure 1, available at <http://links.lww.com/JPHMP/A552>, the differences suggested by Figure 3 are not statistically significantly different.

**Regression results**

Given similarities observed in bivariate comparisons and previous work suggesting systematic differences in earnings based on both individual and agency characteristics, an interval regression model was fitted



**FIGURE 2** Annualized Public Health Earnings by Setting, Degree, and Years of Experience  
 Abbreviations: BHC LHD, Big City Health Coalition local health department; LHD/RHD, local health department/regional health department; SHA-CO, State Health Agency-Central Office.



**FIGURE 3** Mean Earnings by Setting and Degree Type for Those in Agency 5 Years or Less by Setting and Highest Degree Attained<sup>a</sup>  
 Abbreviations: BCHC LHD, Big City Health Coalition local health department; LHD/RHD, local health department/regional health department; SHA-CO, State Health Agency-Central Office.  
<sup>a</sup>Earnings reported in intervals (eg, \$35 000-\$45 000). Excludes outliers (<\$25 000; >\$145 000).

(Table). The dependent variable was annualized earnings, adjusted geographically for cost of living. The model revealed that higher supervisory status; higher educational attainment; white non-Hispanic race/ethnicity; male gender; salaried employment; bargaining unit (labor union) position; certain geographic regions; having a clinical, laboratory, or scientific position; and either SHA or BCHC setting are all associated with higher salary. Compared with non-supervisors, supervisors earn approximately \$6500 more, managers earn approximately \$19 500 more, and executives earn approximately \$35 500 more, all else equal (all  $P < .001$ ). As with bivariate results, each increase in educational attainment was significantly associated with earnings, although having a public health degree versus a comparable degree in another area did not appear to increase relative earnings. Indeed, a public health doctorate was associated with a lower earnings benefit than a non-public health doctorate (which were primarily medical degrees). Similarly, the (largely clinical/nursing) associates had a salary advantage compared with staff

with a PH Associates only. Being a person of color was associated with earning \$4000 less than white peers, all else equal ( $P < .001$ ). Notably, before cost-of-living adjustment, BCHC LHD staff earned more than SHA-CO staff, all else being equal, and other LHD/RHD staff earned less (see Supplemental Digital Content Appendix Table 1, available at <http://links.lww.com/JPHMP/A552>). But after cost-of-living adjustment, the BCHC difference in earnings became nominally less than SHA-CO staff but was not statistically significant. There were also significant regional effects on earnings. The overall model showed a gender wage gap of about \$3000 for women ( $P = .018$ ). A stratified analysis (see Supplemental Digital Content Appendix Table 2, available at <http://links.lww.com/JPHMP/A552>) revealed that this gap was about \$2500 among SHA-CO staff and was statistically significant at  $P < .001$ . The difference was not statistically significant in the LHD estimates. The stratified analysis also reveals somewhat higher earning coefficients for supervisors, clinical and laboratory staff, public health sciences staff, and union staff.

**TABLE**  
**Interval Regression Results for Annualized Earnings in 2017, With Geographic Cost of Living Adjustment**

	Estimate <sup>a</sup>	95% CI <sup>a</sup>	P
<b>Supervisory status</b>			
Nonsupervisor	(reference)		
Supervisor	\$6500	\$4500-\$8500	<.001
Manager	\$19 500	\$16 500-\$22 500	<.001
Executive	\$35 500	\$32 500-\$38 500	<.001
<b>Gender</b>			
Male	(reference)		
Female	-\$3000	-\$5500 to \$500	.018
Years of experience	\$500	\$0-\$500	<.001
<b>Highest degree</b>			
No college degree	-\$12 000	-\$13 500 to \$10 500	<.001
Associates	-\$5500	-\$7000 to \$3500	<.001
PH associates	-\$13 000	-\$16 500 to \$9000	<.001
Bachelors	(reference)		
PH bachelors	-\$1500	-\$4000 to \$1500	.373
Masters	\$3000	\$500-\$5500	.024
PH masters	\$3500	\$1500-\$5000	<.001
Doctorate	\$19 000	\$14 500-\$24 000	<.001
PH doctorate	\$13 500	\$10 500-\$16 500	<.001
<b>Job classification</b>			
Administration/clerical	(reference)		
Clinical and laboratory	\$6500	\$4500-\$8500	<.001
Public health sciences	\$2500	\$500-\$5000	.018
<b>Race/ethnicity</b>			
White	(reference)		
Person of color	-\$4000	-\$5500 to \$2500	<.001
<b>Hourly wage</b>			
Annual salary	(reference)		
Hourly wage	-\$2500	-\$3500 to \$1000	.001
<b>Bargaining unit/union</b>			
Yes	(reference)		
No	-\$5500	-\$9000 to \$1500	.01
<b>Setting</b>			
SHA-Central Office	(reference)		
BCHC LHD	-\$2000	-\$4500 to \$0	.078
Other LHD/RHD	-\$2500	-\$4000 to \$1000	.001
<b>Region</b>			
Regions 1 and 2	(reference)		
Region 3	-\$8500	-\$12 500 to \$4500	<.001
Region 4	-\$7000	-\$11 000 to \$3000	.001
Region 5	\$6000	\$1500-\$11 000	.014
Region 6	-\$2000	-\$7000 to \$2500	.353
Region 7	\$1000	-\$3000 to \$4500	.667
Region 8	-\$3000	-\$7000 to \$1500	.184
Region 9	-\$4000	-\$7500 to \$1000	.01
Region 10	\$0	-\$2500 to \$3000	.86

(continues)

**TABLE****Interval Regression Results for Annualized Earnings in 2017, With Geographic Cost of Living Adjustment (Continued)**

	Estimate <sup>a</sup>	95% CI <sup>a</sup>	P
Constant	\$57 000	\$54 500-\$59 500	<.001

Abbreviations: BCHC, Big Cities Health Coalition; CI, confidence interval; LHD, local health department; RHD, regional health department; SHA, State Health Agency.

<sup>a</sup>Estimates converted from equal \$10 000 interval measures for ease of reading—for example, a mean difference of 2.5 intervals equals \$25 000. Outliers are excluded. Rounded to the nearest \$500 increment. Only included are full-time staff. Excluded because of small cell size are staff who indicated that they worked in social services/all other. Also excluded because of small cell size are those who did not indicate a gender or chose nonbinary/other. Earnings adjusted with cost of living index to account for geographic differences in cost of living.

**Discussion**

The majority of these findings confirm noncontroversial, colloquial understanding of salary differentials—that those with higher supervisory status, education, and experience earn more.<sup>32</sup> Union representation is also predictably associated with higher earnings. Unfortunately, they also confirm the indefensible reality that women and people of color earn less than their white, male peers, holding all else equal.

Salary inequalities are often framed as moral questions of equity and inequity. In our view, this is appropriate. Too often, popular debates about pay gaps rely on amorphous ideas that certain groups have less experience or are less educated than their peers who earn more.<sup>37</sup> The power of data sets such as PH WINS is that we can see that salary disparities persist among thousands of respondents, even after controlling for education, locale, experience, and type of position. A gap in women's earnings persists, even though the public health workforce is predominantly female. Between findings on gender and race/ethnicity, the data suggest that implicit bias may be hindering progress toward equitable salaries in public health as it does in other fields. This is particularly problematic in public health, given the public health system's mandate to serve the most vulnerable communities and to achieve health equity. The public health system will continue to struggle to improve health outcomes among people of color as it struggles to recruit and retain highly effective employees of color. Equitable salaries are a necessary (but not sufficient) precursor to building a diverse, inclusive, and effective public health workforce.

The most surprising finding is that the salary increase for graduate degrees is as small as it is. Taking other factors into account, having a master's degree is associated with only a \$3000 increase in salary. This would seem, at first glance, to discourage the pursuit of a master's degree. However, further analysis reveals that employees with a master's degree occupy supervisory, management, and leadership positions in greater proportions than do their non-master's degree trained colleagues. Thus, earning a master's degree may very well hasten an employee's journey up

the hierarchy and into higher-paying positions. It does not solve the problem, however, that having advanced technical skills does not always translate into being a good candidate for management (and, therefore, higher earnings).<sup>18</sup>

As multiple factors continue to shape the public health workforce, including increasing racial/ethnic diversity, continued retirements of baby boomers, and the growth of bachelor's-level public health education, researchers should continue to monitor the gender and racial/ethnic pay gaps. Further exploration of the findings that public health degrees are associated with lower pay than non-public health degrees at the same level is also warranted. This information should help the field of governmental public health as it endeavors to rebuild its capacity while current workers, many at the highest level of leadership, move on to retirement or other jobs. Making salaries competitive may necessitate greater state and local support of public health, a questionable prospect in this political environment.<sup>18</sup>

**Limitations**

This article has a number of limitations to consider. First, and most importantly, the earnings data are self-reported. It was also one of the portions of PH WINS that most people opted to skip—about 2.5% of eligible respondents did not answer the earnings questions. Missingness was marginally higher among executives versus nonsupervisors (3.5% vs 2.4%,  $P = .08$ ) and in SHA-CO versus BCHC versus other LHD/RHD (3%, 2.6%, 4.2%,  $P = .11$ ). Overall, it did not appear to vary systematically. The survey is cross-sectional and asks about earnings in intervals. This imprecision in measurement was accounted for by use of interval regression, as opposed to a traditional ordinary least squares approach. Response rates did differ between groups—that is, SHA-CO staff had a 36% response rate compared with the local frame at 59%. While both of these response rates are quite high for Web-based surveys,<sup>38,39</sup> and although the balanced repeated replication weights do adjust for nonresponse by frame, these differences are worth considering.



## Implications for Policy & Practice

- Public health leaders should prioritize equitable pay across gender and race/ethnicity within their own departments as they build their organizations' capacity to achieve health equity.
- Supervisors and managers should make sure that employees are working at the top of their abilities and are given room to grow.
- Governmental entities should consider loan repayment programs or ways to reclassify existing employees who obtain an additional degree so that they will earn more with their additional knowledge and skills.
- Researchers should further examine the impact of labor unions on the public health workforce—beyond a salary increase, are there other ways in which unions impact the workforce?
- Researchers should investigate where the recent public health graduates (both bachelor's and master's) are going—are they filling key vacancies in health departments, or getting jobs somewhere else?

Finally, due to sampling design, the analyses are unable to account for state-based effects for all respondents. However, a sensitivity analysis of SHA-CO staff was conducted, which controlled for state-specific effects. This showed extremely similar results (see Supplemental Digital Content Appendix Tables 2-4, available at <http://links.lww.com/JPHMP/A552>), suggesting that the regional control in the overall model does adequately account for geographic variation.

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