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2018 Salary Survey of AMIA Members: Factors Associated with Higher Salaries

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Abstract

Greater transparency in salaries overall and in factors associated with differing salaries can help students and professionals plan their careers, discover biases and obstacles, and help advance professional disciplines broadly. In March 2018, we conducted the first salary survey of American Medical Informatics Association members. Our goal was to summarize salary information and provide a nuanced view pertaining to the diverse biomedical informatics community. To identify factors associated with higher salaries, we reviewed average salaries for different groups (physician status, academic status, and different leadership positions) by gender. We also fitted multiple linear regression models for all participants (N = 201) and for gender, physician- and academic-status subgroup. The mean (standard deviation) salary was $181,774 ($99,566). Men earned more than women on average, and especially among professionals from academic settings. More years working in informatics and full-time employment were two factors that were consistently associated with higher salary.

INTRODUCTION

Understanding salaries overall and the factors associated with higher salaries in biomedical informatics can aid individuals at all stages of the profession in career planning and negotiation. In addition, greater insight into the characteristics associated with higher compensation in biomedical informatics may help advance the field by identifying potential pay gaps, including gender disparities, which can then be addressed.

In several scientific fields, studies were conducted to explore and discover factors associated with salary.[1-9] The majority reported that on average men earned higher salaries than women.[2,3,5-9] The American Association of University Women (AAUW) tracks the pay gaps using data from the Bureau of Labor Statistics and the Census Bureau for different characteristics such as race, geographical location and industry. In Fall 2018, they reported a gender pay gap of almost 20% and listed ‘physicians and surgeons’, ‘registered nurses (RNs)’, and ‘medical and health services managers’ among the 10 occupations where the collective loss is the highest for women.[10]

Focused surveys in the medical domain report findings that are in line with the AAUW report. For example, male internists earned 14% more per hour than female internists[6] and male RNs earned $3,792 to $17,290 more per year than female RNs, depending on the setting, specialty and position.[5] Among early career physician-researchers, males’ salaries were about $10,921 higher, after taking other factors into account.[3] Males with a PhD degree earned $18,000 more annually than females with PhDs.[9] However, a few studies found no gender differences in salary, for example, among radiologists working in public medical schools.[1,4]

The existing work rarely examines factors that may lead to higher salaries for professionals in biomedical informatics and related fields such as health IT. One exception is the 2018 Health Information and Management Systems Society (HIMSS) US Compensation Survey report, which is based on a salary survey of US health IT professionals and conducted annually since 2006. In 2018, responses from 885 participants provided a nuanced view.[11] There were several disparities reported, including lower salaries for women (vs men) and non-white (vs white) professionals in health IT. Compared to males, females earned $22,797 (accounting for 14%) less on average, and the disparity persisted from 2006 to 2018. Although this study estimated gender and race disparities overall and stratified over several factors separately including age, geographic region, job type, and managerial status; other factors including educational degree, years of work experience, workplace setting (e.g. industry, academia, government), area(s) of expertise, and professional duties were not examined and may be important to consider.[3,4,12]

The American Medical Informatics Association (AMIA) is a non-profit professional association dedicated to the development and application of biomedical and health informatics.[13] Founded in 1989, the association includes over 5,600 informatics professionals.[14] The members belong to several different groups; they include academic and industry members as well as clinical and non-clinical members. AMIA members also have a wide range of experience levels, ranging from students to Chief Medical Informatics/Information Officers/Chief Health Informatics Officer (CMIO/CHIO) or higher. As such, analysis of this community may provide a diverse and nuanced view on salary and pay differences between different groups. Understanding the range of members' salaries for various informatics roles can inform the AMIA community about existing gaps and may facilitate activities aimed at ensuring fairness and transparency in compensation for all informatics professionals.

The objectives of this paper are to (1) describe the methods of the first AMIA member wide salary survey, (2) describe the distribution of survey participants' salaries overall, (3) describe the factors associated with higher salaries, including a possible gender disparity, and (4) to explore some of the potential barriers to salary and career advancement among AMIA members.

METHODS

Survey Development

In 2017, the Career Advancement Committee ([CAC] formerly named Academic Career Advancement Committee), a subcommittee of the Women in AMIA Steering Committee, created a survey by adapting content from existing surveys to obtain information from AMIA members about their titles, areas of expertise, years in those areas, gender, and salary, in-part to identify potential gender-based salary disparities. The CAC collaborated with several members from the Women in AMIA Steering Committee and other AMIA members and staff with expertise in survey development, including reviews of the American Health Information Management Association's (AHIMA's) Salary Survey,[15] to iteratively develop the AMIA Salary Survey. The final AMIA Salary Survey was hosted on SurveyMonkey Inc. and included 34 questions focusing on demographic, education, salary and other forms of compensation, informatics expertise, and current informatics position.

Participant Recruitment and Data Collection

The survey was launched through AMIA eNews on March 22, 2018 as well as two AMIA online communities (the Women in AMIA and Implementation forums) and closed on May 16, 2018. Our goal was to keep the survey open until we reached at least 200 participants. After closing the survey, there were 225 participants. We excluded from the current report those who reported that they did not currently have a salary or were retired (N = 21) or listed a salary of $0 (N = 3).

Statistical Analysis

In descriptive analyses, we present summary statistics overall and statistics stratified by gender, physician (vs non-physician) status, and academic (vs non-academic) status. For analyses stratified by gender we excluded participants who either did not report their gender or reported non-binary/other gender (N=9, 4.5%). For analyses stratified by physician-status we excluded 1 participant who did not report this information. Student's t-tests and Chi-square tests were conducted to compare mean and proportion difference in areas of informatics expertise and career barriers between two stratified subgroups (i.e., male vs female, etc.).

To estimate the factors influencing salaries of the study cohort, including gender, we fitted a regression model including all participants as well as prediction models for each subgroup of participants, stratified by gender, physician status, and academic status. For each model, we conducted a multiple linear regression with a backward selection procedure, using the zero-skewness logarithm of salaries, as a dependent variable, and all other factors (except for outcome questions such as benefits including health insurance, life insurance, retirement plan, bonus, flex schedule, etc.) collected from the survey as independent variables. To optimize our models, several steps were taken before fitting the multivariate models: 1) if a factor was categorical, we reclassified the original categories in order to get the lowest Akaike Information Criterion (AIC) of that factor in univariate analysis; 2) if factors were highly correlated, we combined them into a single factor (e.g., factors about faculty/faculty rank, similar informatics expertise, etc.); 3) each workplace setting, informatics area, informatics expertise, and career barrier category was modeled as a yes/no indicator variable. The significance level for factor removal from the model was set as 0.1. Multicollinearity was checked using Variance Inflation Factors (VIF) with the rule of thumb that VIF ≥ 5 indicates multicollinearity.[16] If one or more factors had a VIF ≥ 5 in a model, we excluded the factor with the highest VIF and then checked VIF again after exclusion. The process was conducted iteratively, until all factors in the model had a VIF less than 5. The residual normality assumption of each model was checked using plots and tests of skewness and kurtosis. All the analyses were conducted using Stata 13.0.

RESULTS

Overall Participant Characteristics

Among participants who reported a salary greater than $0 (N = 201), more than half were female (62.7%), and physicians and academics were accounted for 38.3% and 59.2%, respectively. Regarding the education of our study sample, the smallest group were participants with a bachelor's or master's degree (17.4%), while majority had a Ph.D./DSC (42.8%) or a professional doctorate such as MD, PharmD, and JD (39.3%); and 27.4% reported having two or more doctorate degrees. Among the 201 participants, 91.0% were full-time employees. The number of years of experience as an informatics professional was distributed evenly among the participants, with 17.9% ≤ 4 years, 21.9% 5-9 years, 22.4% 10-14 years, 14.9% 15-19 years, and 22.4% ≥ 20 years. Figure 1 compares the representativeness of the survey participants with AMIA members of 2018. Compared to AMIA members, survey participants had a higher prevalence of females and academics, but a lower prevalence of students. The prevalence of physicians among survey participants was similar to the prevalence in the broader AMIA population.

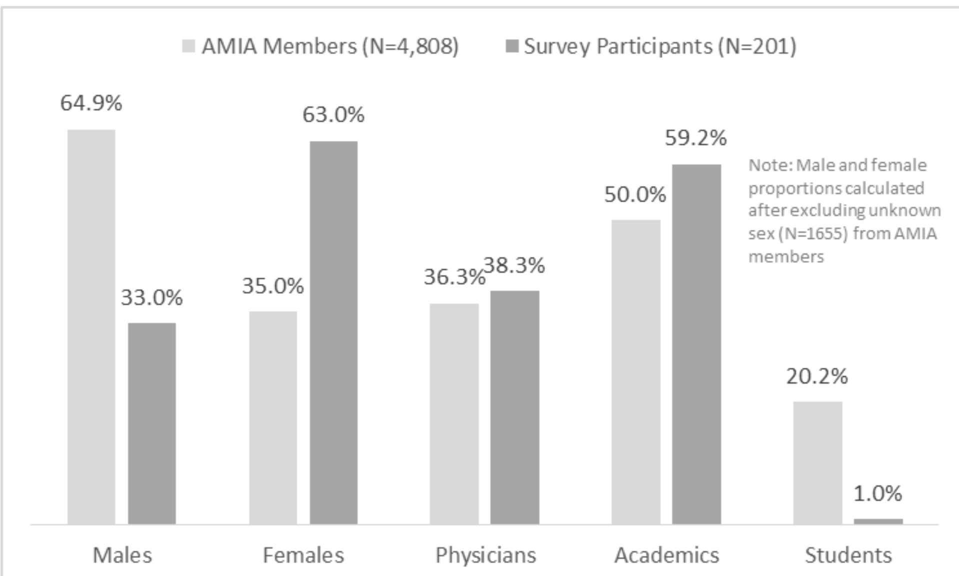

Figure 1. Demographic characteristics of survey participants and 2018 AMIA members

The lowest salary for someone engaged full-time in informatics activities was $37,000, for a full-time student, while the highest salary reported was $1,900,000. The top two highest salaries ($750,000 and $1,900,000) were identified as outliers (using the empirical rule[17] which identifies outliers beyond 3 standard deviations of the mean of the logarithm of salary). However, we further explored the other self-reported data associated with the top two salaries to determine the plausibility of the high salaries. Based on the other self-reported data (e.g. title, years of experience, and other factors) for the participant who reported the highest salary of $1,900,000, we suspect a data entry error for the salary and used $190,000 instead of $1,900,000 in the data analysis. As for the second outlier, $750,000 could be a true value according to the self-reported data, so we kept it in the data. Tables 1-3 show overviews of the salary data overall and for different groups. The overall mean (standard deviation [SD]) annual salary of the AMIA participants in this study was $181,774 ($99,566) and median (interquartile range) was $165,000 ($111,000-$230,000) (Table 1).

Figure 2 shows that the salary distribution was skewed to the right ($p < 0.001$), but the zero-skewness logarithm of salary, ln(salary+57,011.99), was normally distributed ($p = 1.000$).

Table 1. Salaries in US dollars of informatics professionals stratified by gender, physician and academic status

	Overall (N = 201)	Male (N = 66)	Female (N = 126)	Physician (N = 77)	Non-Physician (N = 123)	Academic (N = 119)	Non-Academic (N = 82)
Salary, mean (SD)	181,774 (99,566)	206,091 (118,865)	165,369 (80,807)	252,208 (109,448)	138,142 (60,930)	166,618 (88,579)	203,778 (110,545)
Salary, median (Q1-Q3)	165,00 (111,000-230,000)	197,500 (125,000-250,000)	152,000 (105,000-215,000)	235,000 (196,000-304,000)	130,000 (98,000-175,000)	150,000 (104,000-220,000)	192,000 (128,000-250,000)
All unadjusted mean differences (i.e. male vs female, physician vs non-physician, and academic vs non-academic) were statistically significant (p < 0.05). Abbreviations: SD, standard deviation; Q1, the first quartile; Q3, the third quartile.							

Table 2. Salaries in US dollars of informatics professionals stratified by physician status and gender

	Physician (N = 72)		Non-Physician (N = 119)	
	Male (N = 37)	Female (N = 35)	Male (N = 29)	Female (N = 90)
Salary, mean (SD)	259,649 (126,724)	236,514 (80,887)	137,759 (59,373)	138,150 (62,559)
Salary, difference in means (male vs female)	23,135		-391	
Salary, median (Q1-Q3)	240,000 (196,000-310,000)	235,000 (200,000-290,000)	120,000 (90,000-175,000)	129,500 (98,000-174,500)
Abbreviations: SD, standard deviation; Q1, the first quartile; Q3, the third quartile.				

Table 3. Salaries in US dollars of informatics professionals stratified by academic status and gender

	Academic (N = 115)		Non-Academic (N = 77)	
	Male (N = 37)	Female (N = 78)	Male (N = 29)	Female (N = 48)
Salary, mean (SD)	199,973 (106,996)	150,070 (73,779)	213,896 (134,042)	190,229 (86,191)
Salary, difference in means (male vs female)	49,903		23,667	
Salary, median (Q1-Q3)	205,000 (120,000-263, 000)	130,000 (100,000-188,000)	190,000 (125,000-240,000)	195,500 (127,000-250,000)
Abbreviations: SD, standard deviation; Q1, quartile 1; Q3, quartile 3.				

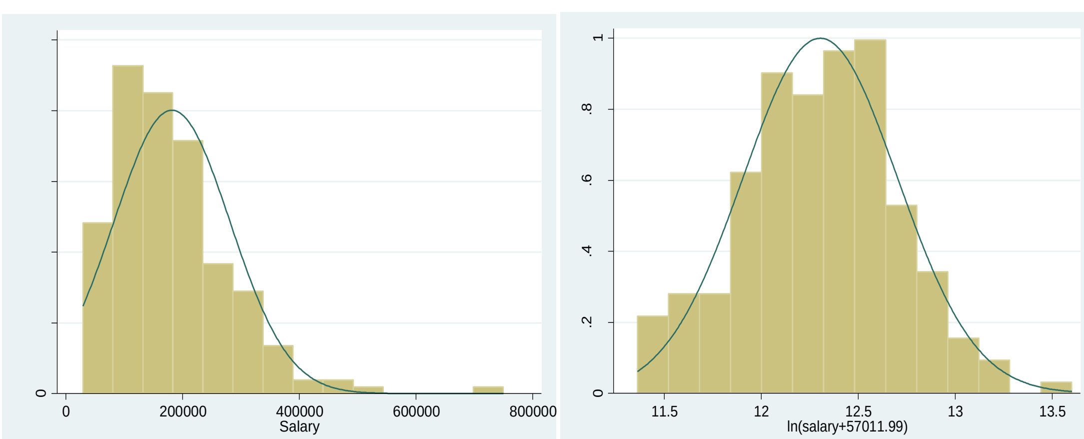

Figure 2. Salary and zero-skewness logarithm of salary distribution shown in histogram graphs

Unadjusted Comparisons by Gender

On average, men earned $206,091 (SD: $118,865) per year, compared to $165,369 (SD: $80,807) per year for women, resulting in a gap of $40,722 (Table 1). The largest unadjusted difference in mean salary, where men earned more than women, was for academics ($49,903), followed by non-academics ($23,667) and physicians ($23,135) (Table 2 and 3). However, among non-physicians, men earned slightly less ($391) than women. In general, men and women had a similar number of informatics expertise areas (5.8 vs 5.7). Figure 3 shows the distribution of members who had a leadership position. There were 81 (40.3%) participants who held a leadership role (e.g. CMIO, vice president [VP], director, and department chair). The percentage of leaders was higher among men than women (53.0% vs 34.1%). The top 3 (out of 27) areas of informatics expertise among men were clinical decision support, implementation, and human computer interaction; and among women were clinical decision support, implementation, and clinical research informatics. In comparison, clinical decision support, human computer interaction, and security were more frequently reported as areas of expertise by male participants, while consumer health informatics was more frequently reported by female participants. Figure 4 shows salary comparisons by years of experience. Salaries for both men and women increased with more years in the informatics profession, with the highest mean salary associated with working for 15-19 years among men and working for 10-14 years among women. There were no consistent differences in men versus women across years spent in the profession.

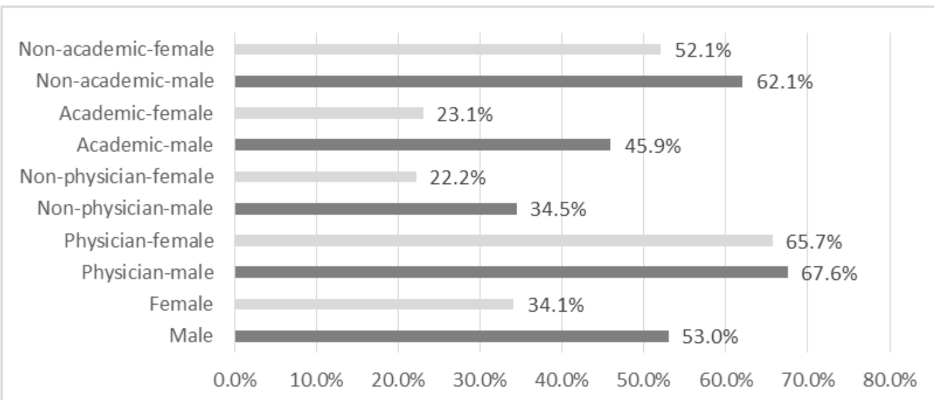

Figure 3. Proportion of participants having a leadership position (e.g. CMIO, VP, director, and department chair, N=81)

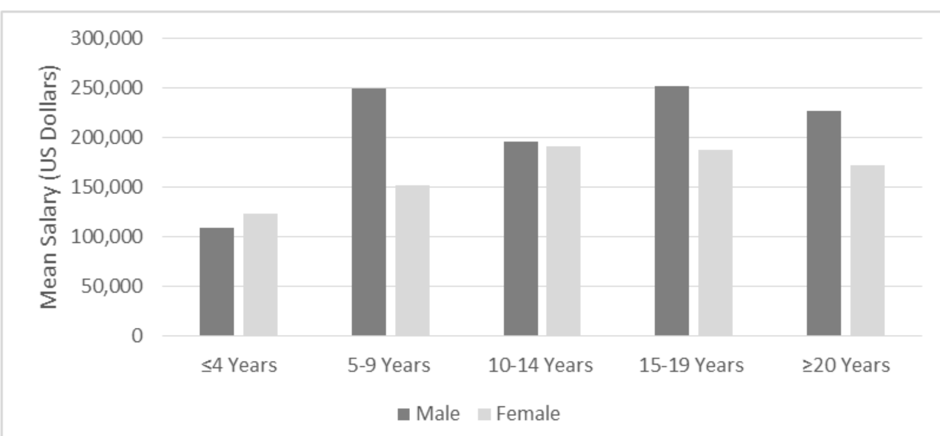

Figure 4. Annual salary by number of years working in the informatics profession stratified by gender (N = 66 males and 126 females)

The survey also requested a list of career advancement barriers. The different rankings of career barriers by gender are shown in Table 4 and rankings by strata of physician and academic status are available online (https://www.amia.org/sites/default/files/AMIA-2018-Salary-Survey-20181031.pdf). Across 5 potential career advancement barriers, on average, men reported fewer than half the number of barriers that women did (0.2 vs 0.6, p<0.001). The #1 top career barrier for men and women was "other barriers" (i.e., work-life balance, career/life change, lack of support from family) (N=5, 7.6%) and taking time off to raise a family (N=22, 17.5%), respectively.

Qualitative analysis was performed of free-text responses to one question in the salary survey: "Are there significant life events that may have impeded your career progress?" The responses were classified according to the typology proposed by Cachon[17] as *personal* (inherent to the individual); *organizational* (determined by the organization); and *social* (determined by sociocultural contexts in which both organization and individual are embedded). Several participants listed multiple factors – "All of the above in one way or another, and at one time or another".

The free-text responses provide more nuance: *Personal:* "Two-body problem that comes from being an academic spouse"; "Special Needs Child, had to file FMLA in the past to meet child's needs"; and "Inability to move to new city due to family commitments". *Organizational:* "No family financial support during education; lack of on-the-job mentoring; starting career in areas of the country with lower salaries than where most other positions are"; "Attitudes of tenured faculty"; and "Burnout and compassion fatigue."

Of the top 5 career barriers (Table 4), three were personal factors, and one simultaneously social and organizational in nature.

Table 4. Top 5 career barriers stratified by gender

	Male (N = 66)	Female (N = 126)
Barriers number, mean (SD)	0.2 (0.5)	0.6 (0.8)
Top barriers, N (%)		
1	other barriers 5 (7.6)	taking time off to raise a family 22 (17.5)
2	providing long-term care for loved one 4 (6.1)	other barriers 20 (15.9)
3	taking time off to raise a family 4 (6.1)	providing long-term care for a loved one 14 (11.1)
4	personal illness 2 (3.0)	racial/gender/sexual discrimination in the workplace 14 (11.1)
5	racial/gender/sexual discrimination in the workplace 1 (1.5)	personal illness 9 (7.1)
Other barriers: i.e., work-life balance, career/life change, lack of supports from family		

Unadjusted Comparisons by Physician Status

On average, physicians earned $114,066 per year more than non-physicians (Table 1). Physicians had slightly fewer areas of informatics expertise than non-physicians (5.3 vs 6.0, p=0.152). Table 5 shows the top 3 areas of informatics expertise stratified by physician status. A higher proportion of physicians reported clinician decision support and implementation than non-physicians; while a higher proportion of non-physicians reported data science than physicians. Physicians reported a similar number of career barriers as non-physicians (0.5 vs 0.5, p=0.516).

Table 5. Top 3 areas of informatics expertise stratified by physician status

	Physician (N = 77)	Non-Physician (N = 123)
Number of areas of expertise, mean (SD)	5.3 (3.1)	6.0 (3.4)
Top Areas of Expertise, N (%)		
1	Clinical decision support 63 (81.8)	Clinical decision support 62 (50.4)
2	Implementation 43 (55.8)	Implementation 49 (39.8)
3	Human computer interaction 26 (33.8)	Data science 45 (36.6)

Unadjusted Comparisons by Academic Status

Academics earned $37,160 per year less than non-academics (Table 1). Academics had more areas of informatics expertise than non-academics (6.1 vs 5.1, p=0.022). Table 6 shows the top 3 areas of informatics expertise stratified by academic status. A greater proportion of academics than non-academic counterparts reported clinical research informatics; while more non-academics reported standards. Academics identified a similar number of career barriers as non-academics (0.5 vs 0.5, p=0.899).

Table 6. Top 3 areas of informatics expertise stratified by academic status

	Academic (N = 119)	Non-Academic (N = 82)
Number of areas of expertise, mean (SD)	6.1 (3.5)	5.1 (2.8)
Top Areas of Expertise, N (%)		
1	Clinical decision support 71 (59.7)	Clinical decision support 55 (67.1)
2	Implementation 50 (42.0)	Implementation 42 (51.2)
3	Clinical research informatics 49 (41.2)	Human computer interaction/Standards 29 (35.4)

Fully Adjusted Analysis

We fitted a model to identify the factors independently associated with the zero-skewness logarithm of salary. As shown in Table 7, gender was not a statistically significant factor associated with salary and was removed from the model. The factors that were associated with higher salaries, and were statistically significant, included physician (vs non-physician), more years working as an informatics profession, full- (vs part-) time employment, a higher number of people directly reporting to participant, having a leadership position (vs non-leadership), hospital/health system (vs non-hospital/health system), expertise of consumer health informatics, and natural language processing. The factors that were associated with lower salaries, and were statistically significant, included having a combination of experience and education that was not part of informatics training, public health informatics area, and mobile health expertise. Also, "other career barriers" (i.e., work-life balance, career/life change, lack of support from family) were associated with lower salaries in the fully adjusted model. For example, the coefficient of physician was 0.312, which means if the annual salary of both physicians' and non-physicians' was increased by $57,012, physicians' salary would be 1.366 times as non-physicians' on average, after controlling for other factors. The R-squared of the model was 0.674, which means 67.4% of variance in the dependent variable (zero-skewness logarithm of salary) was explained by the factors included in the model.

In Figure 5, all plots showed that the residuals of the predictive model were normally distributed. The p-value of the skewness and kurtosis test for normality of the residuals was 0.0861, so we could not reject the hypothesis that the residuals were normally distributed.

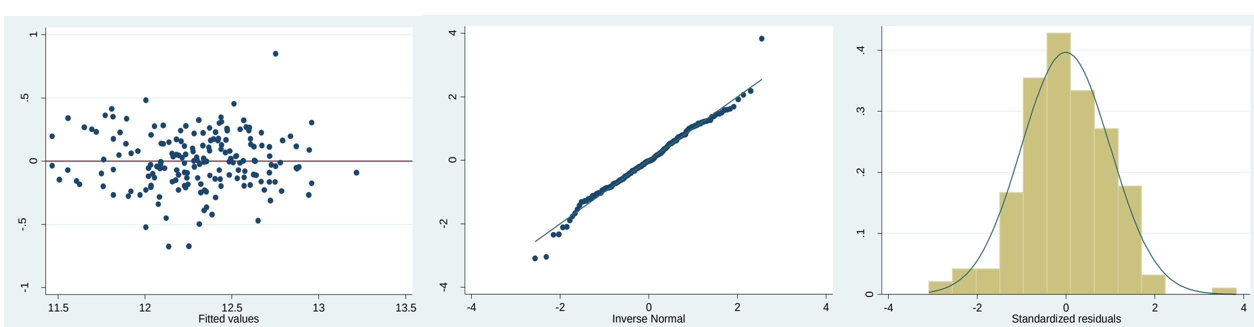

Figure 5. Normality of residual diagnosis by residual vs. fitted plot, Q-Q plot, and histogram of the residuals

We also conducted a sensitivity analysis after excluding the outlier (extremely high salary of $750,000). All significant factors in the model remained statistically significant and estimates of predictors were in same direction, with the predictor magnitudes just slightly changed. Two more statistically significant factors were identified after excluding the outlier: education degree (higher degree associated with higher salary) and the career barrier of "Taking time off to raise a family" (barrier associated with lower salary).

Table 7. Predictive model of zero-skewness logarithm of salary among overall participants

Factors predicting ln(salary+57,011.99)	β	p-value	95% CI of β	Exponential of β
Physician vs non-physician	**0.312**	**<0.001**	**0.226 - 0.380**	**1.366**
Prior career-field or an educational background that was not part of informatics training				
"No"/"Yes, education only"/"Yes, experience only"	0.000	-	-	1.000
"Yes, a combination of experience and education"	**-0.141**	**<0.001**	**-0.215 - -0.066**	**0.868**
Years working as an informatics professional				
≤4 Years	0.000	-	-	1.000
5-9 Years	**0.286**	**<0.001**	**0.176 - 0.395**	**1.331**
≥10 Years	**0.333**	**<0.001**	**0.237 - 0.428**	**1.395**
Full time vs part time	**0.428**	**<0.001**	**0.297 - 0.559**	**1.534**
Number of people directly report to participant	**0.001**	**0.004**	**0.001- 0.002**	**1.001**
Leadership position vs no leadership position	**0.176**	**<0.001**	**0.095 - 0.257**	**1.192**
Place of employment gives a cost of living increase	0.069	0.075	-0.007 - 0.145	1.071
Workplace setting of Hospital/Health system	**0.076**	**0.043**	**0.002 - 0.149**	**1.079**
Area of informatics				
Public health informatics	**-0.099**	**0.018**	**-0.181 - -0.017**	**0.906**
Expertise				
Consumer health informatics	**0.147**	**0.002**	**0.057 - 0.237**	**1.158**
Mobile health	**-0.099**	**0.034**	**-0.191 - -0.008**	**0.906**
Natural language processing	**0.156**	**0.001**	**0.063 - 0.248**	**1.169**
Barrier				
Others (i.e., work-life balance, career/life change, lack of support from family)	**-0.132**	**0.015**	**-0.237 - -0.026**	**0.876**

Fully Adjusted Analysis by Strata of Physician, Non-Physician, Academic, and Non-Academic subgroup

We also fitted models for each subgroup and found that the statistically significant factors varied in the different models. Gender was only an independent factor associated with salary for the model among academics (N = 115). In academics, the mean salary for men was higher than the mean salary for women (β=0.302, p=0.008) after controlling for other factors. Across all models of subgroups, there were only two factors that were consistently associated with higher salary and were statistically significant: 1) more years working as an informatics professional and 2) full-time (vs part-time) employment.

DISCUSSION

To the best of our knowledge, this is the first study to report on the salaries of AMIA members. Overall the mean salary of the 201 salary survey participants was $181,774. Further, our results revealed that overall, men earned a higher salary than women on average. However, after adjusting for other factors, gender was not associated with salary in participants overall or by subgroups of academic and physician status strata, except among participants who reported an academic position, where men earned higher salaries on average. Other characteristics associated with salary may explain the differences across gender. Men (vs women) had a higher education level (doctorate level) (87.9% vs 78.6%), a higher proportion of physicians (56.1% vs 27.8%) and leaders (53.0% vs 34.1%). A lower proportion of men reported career barriers than women (22.7% vs 46.8%). These initial findings should be interpreted with caution, noting that 40.3% of participants reported that they held a higher level leadership position and may over-represent professionals who earn much more than those in non-leadership positions.

Overall, the participants in the AMIA salary survey reported a mean salary between the mean salaries reported by the 2018 HIMSS US Compensation Survey ($109,610) and that reported by the 2018 Association of Medical

Directors of Information Systems-Gartner survey for CMIO/CHIOs ($353,600).[18,19] The mean salary of AMIA members is also in line with those reported by the Association of American Medical College's Faculty Salary Report, Fiscal Year 2018 of $184,300 among MDs in the basic sciences or $145,900 among PhDs in the clinical sciences and point to the potentially lucrative nature of the biomedical informatics profession.[20] On the other hand, the mean salary among academic AMIA salary survey participants ($166,618) was lower vs biomedical informatics faculty in the 2018 Association of American Medical Colleges Faculty Salary Report ($246,500).[21]

Several of the differences observed in salaries among participants in our study were consistent with the HIMSS Compensation Survey.[18] As in our study, in HIMSS[18], men on average earned more than women, $123,244 versus $100,477 per year, respectively. Findings from the HIMSS survey[18] also suggested that salaries increased with age. In our study, we used years working in the informatics profession as a surrogate of age. We found that working for 5 years or more (versus fewer than 4 years) was associated with higher salaries and was statistically significant. However, salary increased continuously with more years worked but only among non-physicians. Unlike the HIMSS survey, where the gender salary gap widened with older age, the gender gap in our study remained relatively constant with increased years working in the biomedical informatics profession (results not shown).

Consistent with previous research, we observed that there were more barriers and different ranking of top career barriers across men and women, which may partly account for the higher salaries observed among men and higher percentage of men in leadership positions compared to women among participants overall.[22,23] Whether differences in career burden due to taking time off to raise a family (#1 barrier for women) versus "other barriers" (i.e. work-life balance, career/life change, lack of support from family, #1 barrier for men) help explain the gender pay gap, as well as differences in resources available to address these barriers for men versus women, requires further research.

The findings of this study should be interpreted with caution and in the context of several limitations. First, the sample size is limited, especially for males. By comparison, the HIMSS study had 885 participants, almost 4 times the number of participants for ours, at 225. The gender ratio of women to men in this study was 2:1. Another limitation is that to protect participant identity, we did not collect sociodemographic factors such as age, race, and ethnicity. A third limitation is that in this study, we had more responses from individuals with senior or leadership-level positions than early-career individuals. For example, there were 20 full professors vs 17 assistant professors, and 81 individuals holding leadership roles vs 2 post-doctoral fellows. Very few students (N=2, 1.0%) and postdocs/fellows (N=8, 4.0%) participated in the survey. In our sample, 34% of women held leadership positions. On average, the number of women holding the most senior-level positions (such as chief-level positions) has not increased since 2015 and remains at 22%[24], even lower representation is reported for specific roles such as hospital CEOs (18% female) and deans and department chairs (16%).[25] Due to the limited sample size, we did not evaluate the interaction effect between these factors and gender on salary levels.

That said, this study represents a promising start in identifying factors associated with higher salaries among informatics professionals. We intend to repeat this salary survey annually or biannually, with AMIA's permission and assistance. We aim to increase and improve representation by reaching out to the full spectrum of informatics professionals for different genders, ages, races/ethnicities, and other characteristics where there may be gaps in compensation. Also, with a larger sample size, we will be able to take into account additional variables such as race and ethnicity and perform time-series analysis and study salary trends.

CONCLUSION

Overall, our study builds on the prior work that suggests that field of biomedical informatics may be a lucrative career choice for many in terms of salary. Gender disparity was only observed for professionals who reported an academic work setting but not in other groups (i.e. physician, non-physician, and non-academic subgroups), when specific factors, not previously considered by prior related studies, were included in the models. More years working as an informatics professional and full-time (vs part-time) employment were the only two factors that were consistently associated with higher salary across all groups and remained statistically significant. Future salary surveys of AMIA members will seek to address the limitations of the current study including small sample size and high proportion of the participants holding leadership roles, to improve representation and the generalizability of the findings and to continue to advance the biomedical informatics profession.

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