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Research Article

Determinants of Salary for Veterinarians Employed in the Field of Shelter Medicine in the United States

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A B S T R A C T

Despite recent growth in the field of shelter medicine, there is a paucity of wage data available. Understanding determinants of salary is helpful for new graduates deciding on a career path as well as employees and employers with regard to budgeting, professional development, and negotiations. An anonymous online survey was distributed via commercial survey platform to shelter veterinarians. Salary was analyzed using multiple linear regression, Kruskall-Wallis equality-of-populations rank-test, and Conover-Iman pairwise comparison. Of the 219 unique respondents, 197 worked as shelter veterinarians, with 157 full-time and 40 part-time. Fifteen respondents worked in academia, and 7 respondents worked in shelter leadership. Full-time shelter veterinarians had a median income of $92,000 [$78,000-110,000], which is the same as the median salary reported for all veterinarians by the AVMA in 2018. Salary depended on years of shelter experience ($P = .004$), supervision of other veterinarians ($P = .015$), region (Southwest, $P = .010$, Mideast, $P = .010$, and Far West, $P = .002$) and size of the metropolitan area (>1 million, $P = .001$ and <250,000, $P = .011$). Part-time veterinarians had a median income of $60,000 [$44,000-84,000]. The only variable predictive of salary was hours worked, with part-time veterinarians paid a median of $48 [36-66] per hour. Academic veterinarians had a median income of $108,000 [90,000-120,000]. For academics, title (assistant professor, $P < .0001$ and professor, $P = .001$), PhD ($P = .010$), and master's ($P = .001$) predicted salary. Veterinarians working in leadership positions had a median income of $120,000 [110,000-198,000], and no variable was significant. Veterinarians employed in academia and leadership had a higher salary than veterinarians employed in the shelter. There are predictors of salary for shelter medicine veterinarians, which will help both potential employers and employees, determine reasonable salaries when budgeting, negotiating, or planning personal development.

Introduction

Recognized in 2014 as a veterinary specialty by the American Veterinary Medical Association (AVMA), shelter medicine is a rapidly advancing area of the veterinary profession. Although still a relatively new field, interest in a career in shelter medicine is increasing. According to the Association of American Veterinary Medical Colleges (AAVMC), shelter medicine was the second most popular (tied with food animal and equine) applicant career interest for incoming veterinary students in 2017, [1] up from fifth place in 2015.[2] Most veterinary colleges in the United States currently address shelter medicine in their curricula. Major conferences now offer shelter medicine continuing education. Postgraduate internship, residency, fellowship, and online certificate opportunities exist and career opportunities are plentiful. Despite this growth, there is a paucity of wage data available. Understanding determinants of salary can help new graduates, as well as employees and employers, with regard to budgeting, professional development, and negotiations.

While aggregate salary estimates exist for the veterinary profession,[3-6] these tools might be too general to aid those interested in determining a target salary or improving their earning power. Moreover, none are peer-reviewed. The AVMA provides a salary estimator tool that takes into account multiple demographic and employer factors (including nonprofit status), but targets it only at new graduates[7] and current students.[8] The AVMA has published the coefficients of the linear regression for experienced veterinarians[9] but nonprofits are not included in the public practice category. To the authors' knowledge, the only publication available that focuses on shelter medicine wages was conducted in 2011.[10] The aim of this study was to determine variables that predict the salaries of veterinarians employed in the field of shelter medicine in the United States.

Materials and Methods

A survey was created using a commercial survey platform (Survey Gizmo; https://www.surveygizmo.com) and distributed to the 701 veterinary members of the Association of Shelter Veterinarians listserve in an email on February 13, 2018. The survey was also distributed on the Veterinary Information Network in the Shelter Medicine folder and a social media posting by Association of Shelter Veterinarians in both a public and members-only forum. The survey was open from October 2, 2018 through April 15, 2018 and all responses were anonymous. The full survey is available in Appendix 1. The survey did not include any access to identifiable private information and was exempt from Institutional Review Board review.

Salary for veterinarians with primary work responsibility in the United States was analyzed by 4 major types of employment: part-time shelter veterinarian (contracted less than 40 hours per week), full-time shelter veterinarian, academician, and shelter leadership. A Kruskal-Wallis equality-of-populations rank test was used to compare age, years in shelter medicine, and salaries between full-time positions, and a Conover-Iman pairwise comparison was performed between position pairs. Predictors of salary were determined for each position using multiple linear regression with robust estimators

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of variance. Models were built using backward stepwise regression, with competing models evaluated using adjusted R^2, Akaike information criterion, and Bayesian information criterion. Post-hoc analysis of models was used to determine the normality of residuals and identify outliers or points with high leverage. Variables considered in prediction models included regions of the country (as determined by the United States Bureau of Economic Analysis),[11] size of the metropolitan area, hours worked, hours contracted, age, gender, years as a vet, years of experience with shelter medicine, years in position, supervision of other veterinarians, number of veterinarians supervised, supervision of staff, postveterinary qualifications (PhD, masters, other degree, internship, residency, board certification), and benefits. For shelter veterinarians and leadership, the type of shelter, shelter annual budget, shelter annual intake, shelter daily count, number of organizations worked with, job title (chief, lead, and staff vet) and job responsibilities were also considered. For academics, the academic title was analyzed. Significance was set at $P < .05$ for all tests, with results reported in dollars [IQR] or hours [IQR].

Results

Due to the multiple methods of survey solicitation, several of which could not be tracked, the overall survey response rate could not be determined. We obtained 233 responses, 2 of which appeared to be duplicate responses based on IP address and demographic information, 3 of which were not from veterinarians, and 1 of which contained nonsensical information, for a total of 227 conforming survey responses. Of these respondents, 219 identified themselves as veterinarians working in or with shelters in the United States and were included in the salary analysis (Table 1). Of these, 197 worked as veterinarians with or for one or more shelter organizations (shelter veterinarian), with 157 employed full time and 40 employed part time. Fifteen respondents worked in academia (academic), and 7 respondents worked in nonveterinary positions (leadership). Median income across all full-time positions was $94,500 [$80,000-110,000] with a median of 45 [42-50] hours worked per week.

Table 1
Demographics. Responses reported as counts (categorical variables) or medians (continuous variables).

	Shelter Veterinarian			
	Full-time	Part-time	Academic	Leadership
Number	157	40	15	7
Gender				
Female	140	37	14	7
Male	16	3	0	0
No response	1	0	1	0
Age (median [IQR])	39 [33-47]	42 [35-47]	40 [35-52]	43 [41-53]
Region				
New England	5	5	0	0
Mideast	14	3	2	1
Great Lakes	20	8	2	0
Plains	6	3	1	0
Southeast	45	8	1	1
Southwest	19	2	6	2
Rocky Mountain	8	1	0	0
Far West	37	8	3	3
No response	3	2	0	0
Metropolitan size				
Fewer than 250,000 population	107	20	7	3
250,000 to 1 million population	28	13	0	2
1 million population or more	22	7	8	2
Years in shelter medicine (median [IQR])	5 [3-9]	6 [3-10]	8.5 [6-15]	13 [12-17]
Supervision of other vets	62	5	0	5
Masters	27	6	11	3
PhD	1	0	2	0
Academic title				
Instructor			1	
Researcher			1	
Assistant Professor			9	
Professor			3	
No response			1	

Table 2
Significant variables for full-time shelter veterinarians. Categorical variables that did not reach significance in italics.

Variable	Coefficient	P	95% CI
Years in shelter medicine	$1,607	0.004	$513-2,701
Supervise veterinarians	$10,801	0.015	$2133-19,469
Region			
Plains	baseline	-	-
New England	*$4,895*	*0.502*	*$-9,488-19,278*
Mideast	$20,264	0.010	$4,939-35,589
Great Lakes	*$-970*	*0.847*	*$-10,903-8,964*
Southeast	*$5,351*	*0.205*	*$-2,957-13,659*
Rocky Mountain	*$-7,965*	*0.296*	*$-22,986-7,057*
Southwest	$13,604	0.010	$3,289- 23,919
Far West	$19,595	0.002	$7,358-31,833
Metropolitan Size			
250,000 - <1 million	baseline	-	-
Less than 250,000	$16,702	0.011	$3,919-29,485
1 million or more	$13,603	0.001	$5,324-21,883

Full-time shelter veterinarians had a median income of $92,000 [$78,000-110,000]. Full-time shelter veterinarians were contracted for a median of 40 [40-40] hours per week and worked a median of 45 [42-50]. In multiple linear regression, years of shelter experience, supervision of other veterinarians, region, and size of the metropolitan area all predicted income of full-time shelter veterinarians (Table 2). The R^2 value was 0.31, and the intercept was $60,007, meaning that the model predicted 31% of the variation in shelter veterinarian salary and that the yearly income for a new graduate working as a shelter veterinarian full time in a metropolitan area of 250,000 to 1 million people in the Plains region who did not supervise other veterinarians would be approximately $60,000.

Part-time veterinarians reported a median income of $60,000 [$44,000-84,000], were contracted for a median of 24 [16-30] hours per week and actually worked a median of 26 [16-32]. Only "hours actually worked" predicted part-time income (Fig 1), with part -time veterinarians paid an additional $1,106 per year for each hour worked per week. This equated to a median of $48 [36-66] per hour. The R-squared was 0.15 and the intercept $38,964, meaning that the model predicted 15% of the variation in income for part-time veterinarians and that a veterinarian working the average of 24 hours per week would expect an income of $65,000 ($38964 + (1106 × 24)).

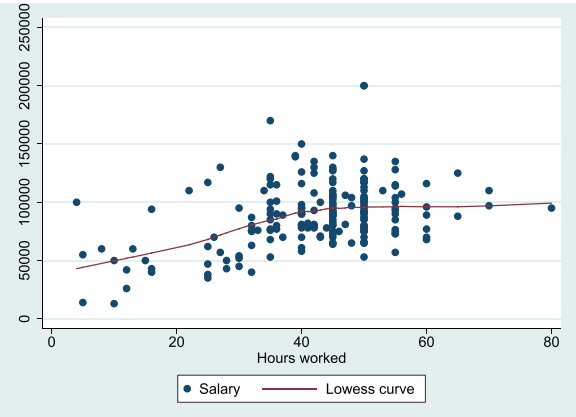

Fig 1. Scatterplot of yearly income by hours worked for shelter employed veterinarians overlaid by Lowess curve. Hours worked is only meaningful for part-time veterinarians (less than 40 hours).

Table 3
Significant variables for academic veterinarians. Categorical variables that did not reach significance in italics.

Variable	Coefficient	P	95% CI
Title			
Instructor	baseline	-	-
Researcher	*-$4,813*	*0.281*	*-$14,413-4,789*
Assistant Professor	$17,000	<0.0001	$17,000-17,000
Professor	$22,188	0.001	$12,586-31,789
PhD	$45,813	0.010	$14,124-77,501
Master's	$21,813	0.001	$12,211-31,414

Academic veterinarians had a median income of $108,000 [$90,000-120,000] and reported working a median of 50 [40-50] hours per week. For academicians, title, presence of a PhD and presence of a master's degree predicted income (Table 3). The R^2 value was 0.8, and the intercept was $66,000, meaning the model predicted 80% of the variation in income and that a veterinarian without a PhD or masters working in academia as an instructor would expect an income of $66,000.

Veterinarians working in leadership positions had a median income of $120,000 [$110,000-198,000] and reported working a median of 45 [45-50] hours. No variable predicted leadership income.

Age did not vary between full-time positions (H = 4.2, 2 d.f., P = .1212), although years in shelter medicine did (H = 17.8, 2 d.f., P = .0001). Years in shelter medicine were different between full-time shelter veterinarians and academicians (T = −2.9, P = .0023) and full-time shelter veterinarians and leadership (T= −3.5, P = .0003), but not between academicians and leadership (T = −1.2, P = .1256). Salaries for full-time positions (Fig. 2) differed by position (H = 11.6, 2 d.f., P = .0030). Full-time shelter veterinarians earned less than academicians (T = −2.1, P = .0194) and leadership (T = −2.9, P =.0018), while salaries of academicians and leadership did not differ (T = −1.2, P = .1152).

Discussion

Our study provides predictors of income for shelter veterinarians in the United States. We found that these predictors, and the strength of the prediction models varied, depending on the type of employment. Our findings, although based on a relatively small sample population, might help provide information for employers and employees within shelter medicine who are attempting to set budgets or negotiate for remuneration.

The predictors found here were similar to results found in AVMA's new graduate salary calculator[7] where hours worked, years of experience, and location mattered for veterinarians employed exclusively in companion animal primary care medicine, but advanced degrees did not. Similar to the AVMA's findings,[9] completion of an internship did not have an effect on salary. We also found that predictors for academic salaries mirrored those found in the AVMA salary calculator for academicians, where advanced degrees increased salary, while geography did not. There was no equivalent for leadership positions to compare to the AVMA calculator. Unlike this analysis, the AVMA has found that residency and board certification increase salary for early career veterinarians by $2,527-$3,732 and $14,599-$16,388 per year, respectively.[12] It was not surprising that residency and board certification were not significant here, given how unique shelter medicine is as a field and how relatively recently shelter medicine has been recognized as a specialty. Since the first examination was offered in 2015, less than 20 veterinarians have been credentialed in shelter medicine through the American Board of Veterinary Practitioners and nearly all had completed a residency. Whereas in companion animal practice, board certification may lead to work in a referral niche, in shelter medicine, the job market for specialists may be quite different. It is possible that board certification may serve more as a screening tool rather than a salary enhancer, as 50% of academics and nearly 30% of leadership was board certified as opposed to 6% of shelter veterinarians.

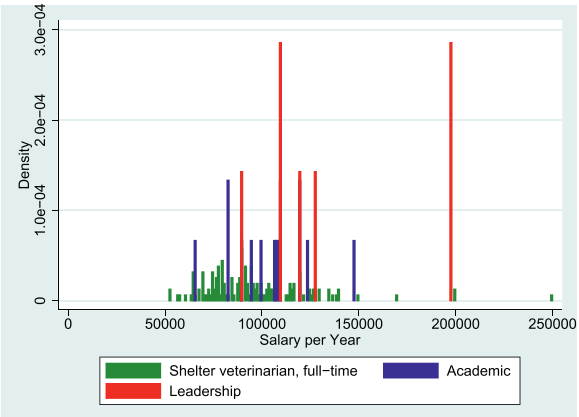

Fig 2. Histogram of salary frequency for full-time positions. Height of bars relative for each position.

Unlike full-time veterinarians, only hours worked predicted income for part-time veterinarians. This might be due to part-time veterinarians working in a relief capacity rather than as a core team member, or part-time employment may reflect different needs or interests of the employing shelter.

Analysis for veterinarians in leadership was limited due to very small sample size. In addition, respondents likely represented a very heterogeneous population, ranging from chief veterinary medical officers without clinical responsibilities to executive directors. Average income for this group was higher than full-time shelter veterinarians, and although statistically not different from academicians, visual inspection of the histograms for the positions suggests that there may be a difference that would become apparent with a larger sample size.

Limitations

There is a potential for nonresponse bias that could affect the size of the coefficients if lack of response was related to the amount of income, although it is unlikely to affect which predictors were found to be significant. The sample size was limited for some analyses such as the leadership position, which limited our ability to draw conclusions. The sample size for full-time shelter veterinarians also limited analysis of the category of region.

While R^2 values were reasonable for a relatively stochastic measure such as income, there was a large proportion of income difference not explained by models, particularly for part-time veterinarians. The fit of the model for academic veterinarians was much higher which may indicate a more regimented compensation structure or less variability within the position.

Conclusions

We identified several predictors related to basic information relevant to their respective areas of practice for full-time shelter veterinarians, part-time shelter veterinarians and academics. Veterinarians in academia and leadership positions had a higher salary than full-time shelter veterinarians. Contributors to salary were unique to each position, which could limit the ability of full-time shelter medicine veterinarians to move laterally or upward between positions. However, movement into leadership represents an opportunity for shelter veterinarians to both increase their influence in shelter operations and income.

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Supplementary materials

Supplementary material associated with this article can be found in the online version at doi:10.1016/j.tcam.2020.100428.

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