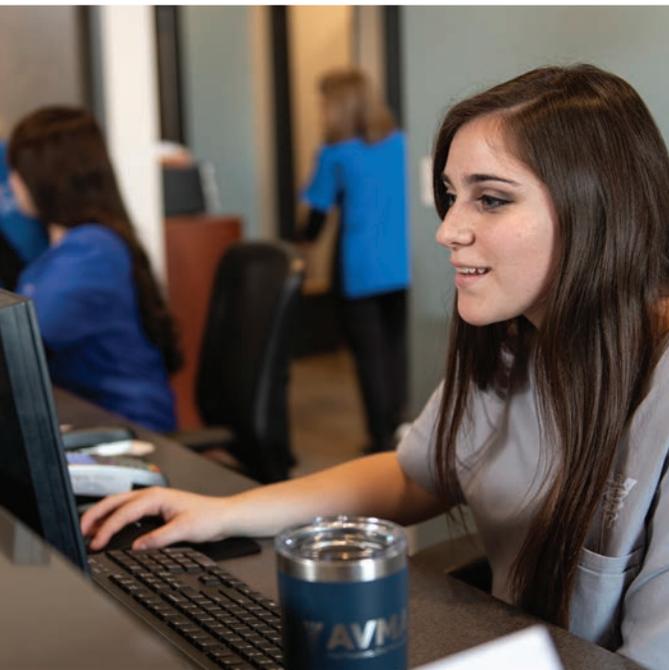


2020 ECONOMIC STATE OF THE VETERINARY PROFESSION



2020 AVMA Report on

ECONOMIC STATE OF THE VETERINARY PROFESSION

Veterinary Economics Division
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INTRODUCTION

2019 marked a year of strong growth and continued demographic shifts for the veterinary profession.

Starting salary for new veterinarians and average salary for all veterinarians increased from the previous year's levels. While companion animal medicine continues to be the predominant focus for all veterinarians, the profession saw low unemployment and high rates of job offers for new graduates across species focus and industries. Debt continues to be of concern, but the average debt levels of new graduates fell by \$2,481 as a record-high 18.2% of graduates reported no debt upon graduation.

Women and millennials continue to dominate the demographic shifts observed in the profession. As baby boomers approach and pass retirement milestones, millennials have begun to overtake the workforce, approaching 35% of the profession. Women continue to enter veterinary medicine in large numbers, now comprising 70% of DVMs.

With these demographic shifts come changes to workplace culture and needs, and AVMA's analysis finds many opportunities to continue strengthening the profession. Wellbeing and mental health remain a top priority to help ensure our fellow veterinarians thrive in a rewarding profession. As demographics change, work preferences require new tactics for attracting and retaining talent. The profession also continues to see a gap in pay between women and men: In 2019, this gap was \$2,600, adjusting for other factors.

Meanwhile, small practices continue to be highly dependent on wellness exams (up to 30% of revenue). Especially as COVID-19 changes the economic, social, and physical health landscape of the world, practices must adapt in order to support their economic sustainability.

As we reflect on 2019, we are also acutely aware of the sudden, far-reaching, and varied impact COVID-19 has had on the veterinary profession in 2020. Across the country, veterinary practices have made tremendous changes to ensure patients continue to receive essential veterinary care while implementing new safety measures to protect team members and clients. This report highlights not only the observations of 2019, but challenges and opportunities that the first part of 2020 has brought to the profession.

AVMA research studies

The AVMA conducted surveys in 2019 and early 2020 to assess the state of the profession for graduates, practices, owners, associates, and others in the profession. The data collected from these surveys and subsequent analysis highlight strengths, changes, and opportunities for the veterinary profession:

- Surveying new graduates allows us to explore postgraduate plans, debt levels, and starting salary across location, practice type, and demographic characteristics.
- The AVMA's survey of veterinarians provides data on income, hours working in practice, the job market, mobility, and wellbeing.
- AVMA also surveyed practice owners to determine demographics, practice characteristics, and revenue composition.
- Additionally, the AVMA fielded a survey to determine early impacts and projections for how COVID-19 is impacting the profession.

THE MARKET FOR VETERINARY EDUCATION

To maintain a strong veterinary profession, it's important to understand the experiences of recent graduates who are about to embark on their new careers as veterinarians. This section of the report examines postgraduate plans, debt levels, and starting salaries of recent graduates from the 30 AVMA COE-accredited colleges of veterinary medicine in the United States. Survey data on veterinary graduates allow us to assess the market for new veterinarians by estimating the impact of location, practice type, and other demographic variables on debt and income.

Survey data show positive trends for job offers, starting salary, and lower debt ratios. Most graduates received job offers (94.6%) and planned to pursue full-time work (60%) in private practice in the companion animal sector (43.4%). Average starting salary increased by \$4,000 in 2019 for private practice, and average internship salaries increased by \$1,235. Mean debt levels dropped by \$2,481, weighted debt-to-income ratios (DIR) fell by 0.45, and a record-high 18.2% of graduates reported no debt upon graduation in 2019. Although the numbers are promising, these figures vary by location, demographics, education, and practice type.



Average debt levels decreased by \$2,481 but 10.7% of graduates report over \$300,000 in student loan debt

There are opportunities for further strengthening the profession, as seen by AVMA's analysis. Women continue to earn less than their male peers, earning \$2,600 less net of other factors. In 2019, the average public practice salary decreased by \$483, and graduates in rural communities earned \$3,200 less than those in urban or suburban areas. A significant portion of graduates carried high levels of debt, with 10.7% reporting over \$300,000. Mean DIR remained high for those pursuing advanced education (over 4.5), particularly for students at Tuskegee University (3.6 DIR).

Methodology

In the spring of 2019, the senior survey was sent to 30 AVMA COE-accredited U.S. veterinary colleges and two COE-accredited veterinary colleges located outside the United States. This report highlights analysis of data provided by graduates of U.S. veterinary colleges. These institutions trained and graduated 3,177 veterinarians, of whom 86.2% responded to the AVMA senior survey.

The overall response rate was down slightly from 2018 (88.3%), and response rates varied by university (Appendix A). The Ohio State University had the largest number of respondents, and 10 of the 30 schools participating had 100% response rates. The average response rate for the two off-shore colleges participating in the survey was 44.8%, up from 36.1% in 2018. As previously reported, the low response rate of off-shore institutions compared with those in the U.S. limits the ability to conduct analysis on foreign institutions. Therefore this study is limited to U.S. institutions. Future publications will report on the demographic assessment of foreign institutions and the consequential data limitations discussed.

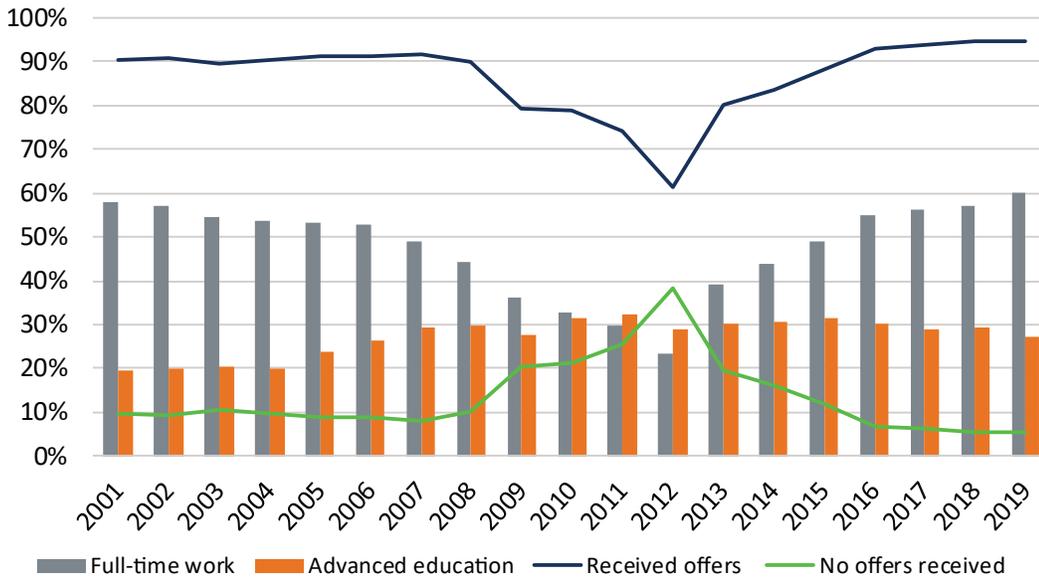
A major component of the senior survey addresses the postgraduate plans of graduating veterinary students. Students are asked to report their plans after graduating, describing whether they plan to pursue an internship, residency, continuing education or full-time employment. They also are asked to report the location of any postgraduate employment or education. When assigning regions to locations, the first digit of each respondent's ZIP code was used. (Appendix B).

Offers

Most graduates were able to secure full-time offers or advanced education opportunities at the time of the survey. Although some students said they had not secured employment when the survey was distributed (5.4%), evidence from other AVMA economic surveys suggests that many of these new veterinarians do find employment within a year of graduating.

The 2019 survey found 94.6% of graduating students reporting they had secured full-time offers of either employment or continuing education. This was essentially stable from 94.7% in 2018. Prior to that, the number had been improving steadily since 2012. While all respondents reported whether they had secured post-graduate positions, not all students reported the type of positions secured. Figure 1 shows the level of full-time employment and academic offers received and reported by veterinary graduates each year beginning in 2001.

FIGURE 1: DVM GRADUATE OFFERS



During the 2007-2009 financial crisis, there was a decline in the number of graduates securing full-time placements. Where 89.8% of 2008 graduates reported full-time offers, only 79.5% did so the following year, in 2009. This downward trend persisted until 2012, when only about three-fifths of the graduating class (61.5%) reported receiving full-time postgraduate employment or continuing education offers – the low point for the 19-year period.



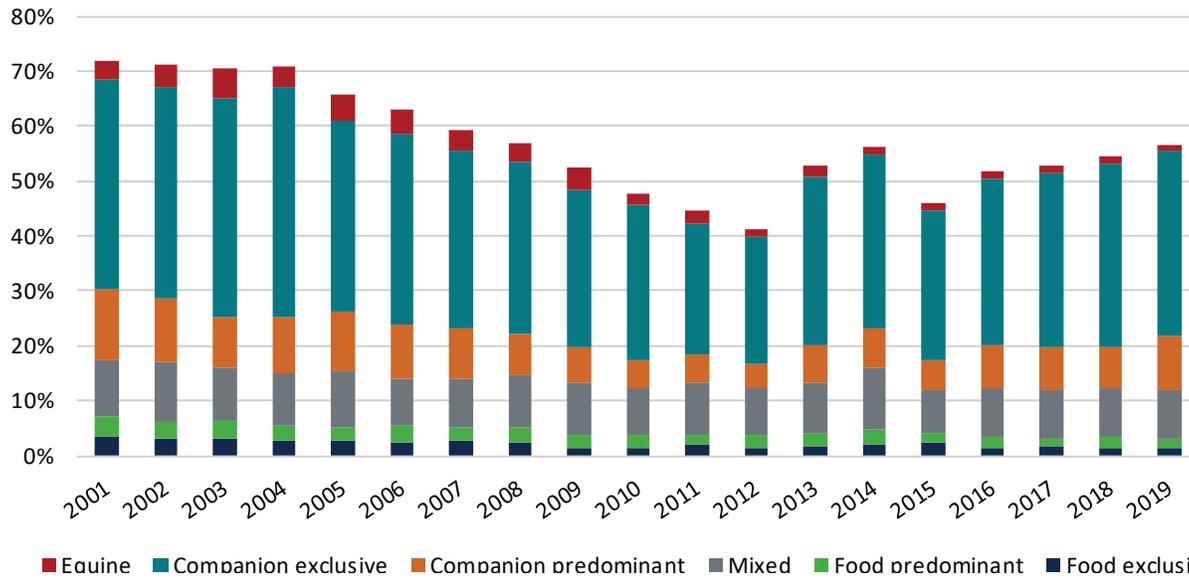
The financial crisis led to a decrease in offers, with 40% of 2012 graduates not receiving offers. By 2018, 95% of graduates were receiving offers.

Throughout the same period, 2001 through 2019, 20% to 60% of those with offers reported finding full-time employment. The lowest point in the period occurred in 2012, when only 23.6% of the class reported finding full-time employment and 29.1% planned to pursue continuing education. Since then, the percentage of the class reporting full-time employment offers has been steadily increasing, reaching an all-time high of 59.9% in 2019. The percentage of graduates securing positions to continue their education has remained primarily flat, but decreased slightly from 29.4% in 2018 to 27.4% in 2019, the lowest level since 2006.

Practice selection

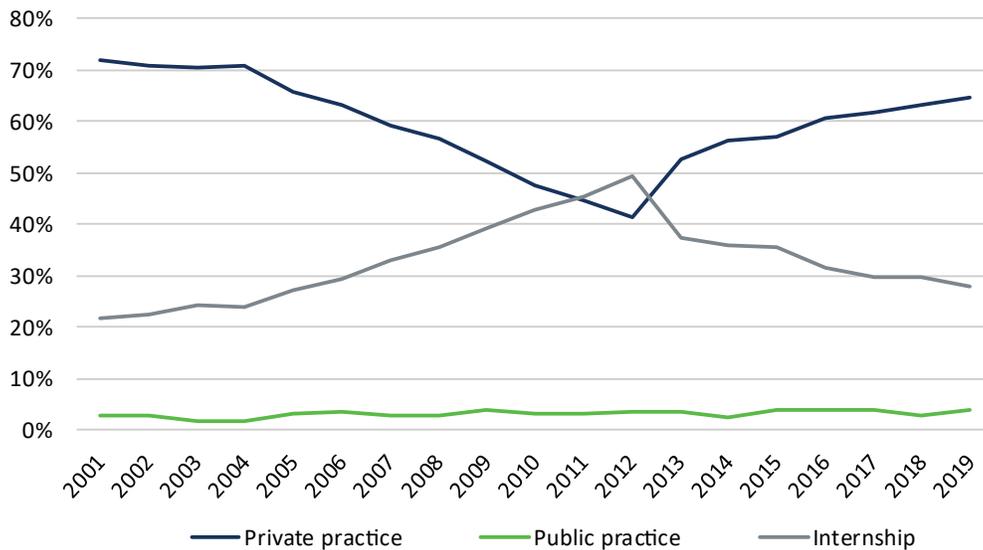
Among those securing full-time positions, most graduates opt for companion animal exclusive positions in private practice. Over the last 19 years, graduates opting to pursue companion animal exclusive positions have ranged from a low of 23.1% in 2012 to 42.0% in 2004 (Figure 2). Full-time positions in the companion animal exclusive sector decreased in the early 2000s, then began increasing as the economy recovered from the 2008 financial crisis and employers were able to hire more. From 2018 to 2019, selection of companion animal exclusive sector stayed relatively consistent (33.2% and 33.5%, respectively) although animal sector jobs (exclusive and predominant combined) rose by 2.5% to 43.4% in 2019.

FIGURE 2: PRIVATE PRACTICE SELECTION



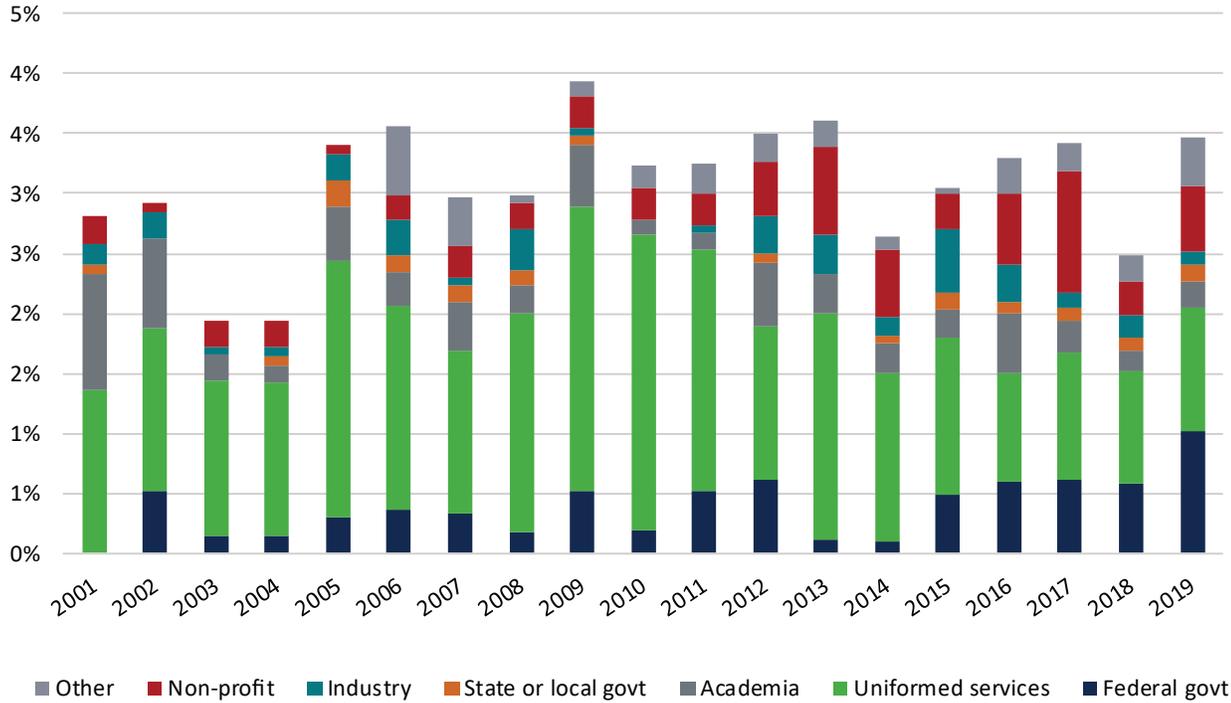
Starting in the early 2000s, internship participation rose steadily as full-time employment decreased (Figure 3). Internship participation peaked in 2012, then began decreasing as full-time employment increased due to economic recovery. From 2018 to 2019, internship participation declined by 1.3%, to 24.4% in 2019. Among graduates reporting they intended to pursue internships during the last 10 years, 70-80% of internships were in the companion animal sector (Appendix B). Roughly one-fifth of internships were in the equine sector, with fewer than 5% in either food animal, mixed animal, exotic or zoological animal, or other sectors.

FIGURE 3: PRACTICE VS. INTERNSHIP SELECTION



From 2001 through 2012, the number of new veterinarians entering public practice remained relatively flat (below 5%), in response to economic hardships (Figure 4). Despite recent declines, uniform services remain the most popular field within public practice, with 1% of graduates choosing this career path in 2019. Since 2001, this number has ranged between 0.9% and almost 2.5%. In 2019, 1.0% of graduates reported employment with the federal government, the highest level since 2001. Each year for the last 19 years, less than 1% of the graduating class reported accepting positions in federal/state government, colleges and universities, industry, or non-profits. The industry category includes pharmaceutical/biological, feeds/nutrition, laboratory, agriculture/livestock production, business/consulting services, and other industry/commercial.

FIGURE 4: PUBLIC-SECTOR SELECTION

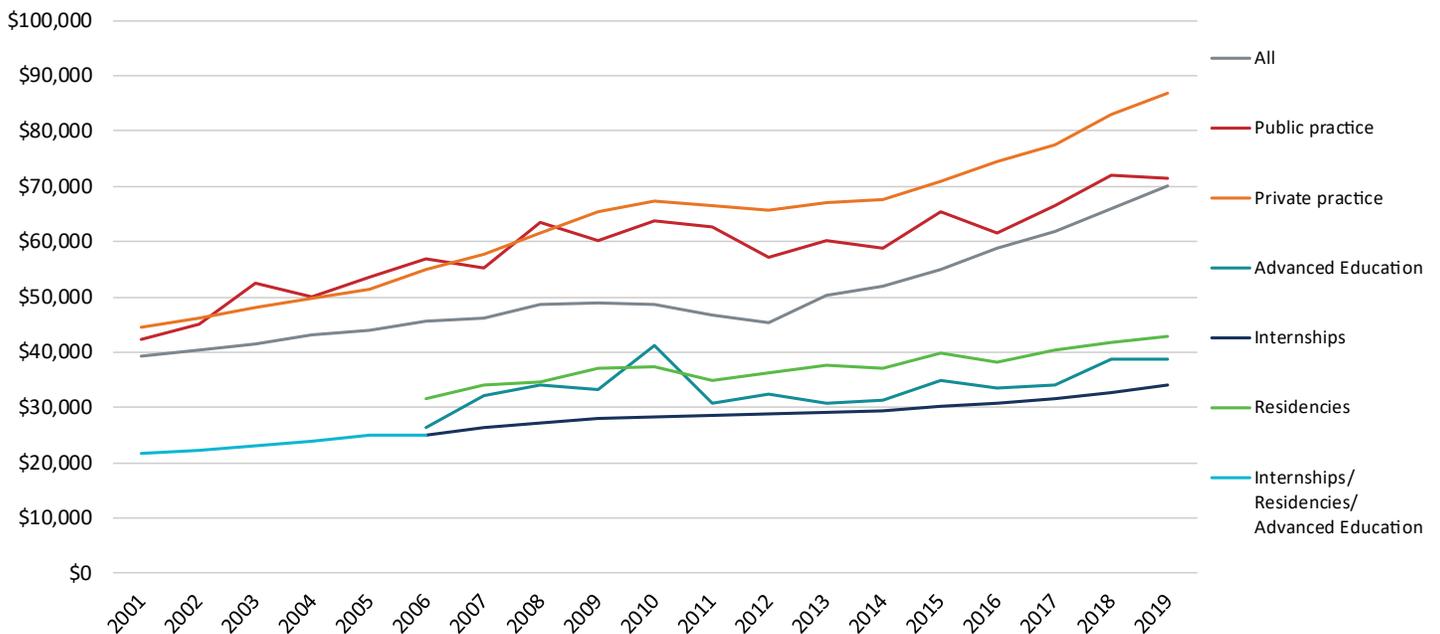


In 2019, 2.1% of respondents said they planned to pursue residency, not significantly different from 2.2% in 2018. Since 2001, that percentage has ranged between 2% and 4%. Fewer than 1% of 2019 graduates reported plans to pursue either a master’s or doctoral degree (Appendix C).

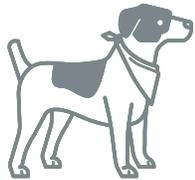
Starting salary

Throughout the period 2001 through 2019, there remained a significant difference in income based on postgraduate employment position. Prior to 2008, positions in public and private practice had fairly similar levels of compensation (Figure 5). After 2008, positions in private practice had a clear lead.

FIGURE 5: AVERAGE STARTING SALARY FOR NEW VETERINARIANS



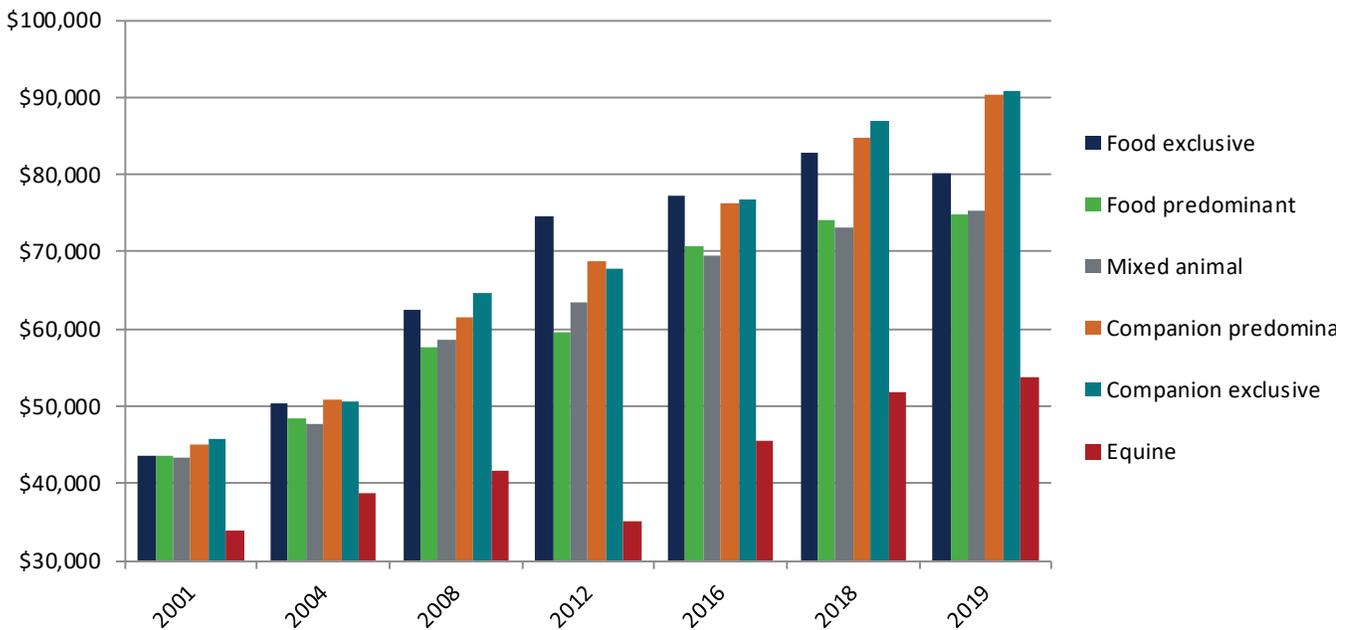
The average compensation of all graduates in 2019 was \$70,045, up from 65,983 in 2018. Private practice positions also have been on a steady rise, increasing by over \$4,000 (\$82,894 in 2018 and \$86,920 in 2019). In 2019, compensation for public practice positions remained steady at \$71,422, compared with \$71,905 in 2018. Those pursuing internships had the lowest level of compensation in 2019 at \$34,029.



Companion animal exclusive had the highest level of compensation amount for private practice, with an average starting salary of \$90,893 in 2019

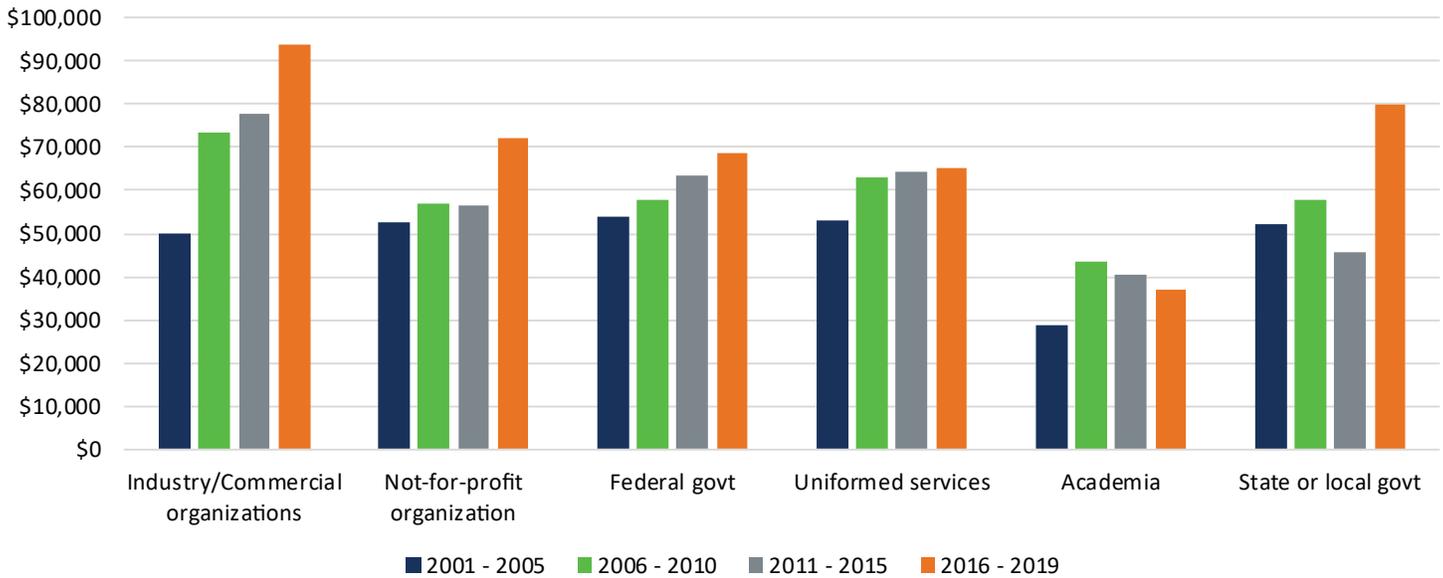
All sectors follow a similar trend: strong growth from 2000 to 2007, some flat to declining trends during the recessionary period, with a rebound post-2012 recovery. Among those in private practice, companion animal exclusive had the highest mean level of compensation at \$90,893, closely followed by companion animal predominant with a mean starting salary of \$90,385 (Figure 6). The mean salary of those receiving offers in food animal exclusive practice was \$80,088, down \$2,600 from 2018. There was no significant change in the starting salaries of those securing full-time employment in the food animal predominant sector between 2018 and 2019. Those in mixed practice sectors received a mean level of compensation of \$75,391, up \$2,300 from 2018. Those in the equine sector received a mean level of compensation of \$53,804, up from \$51,893 in 2018.

FIGURE 6: PRIVATE PRACTICE AVERAGE STARTING SALARY



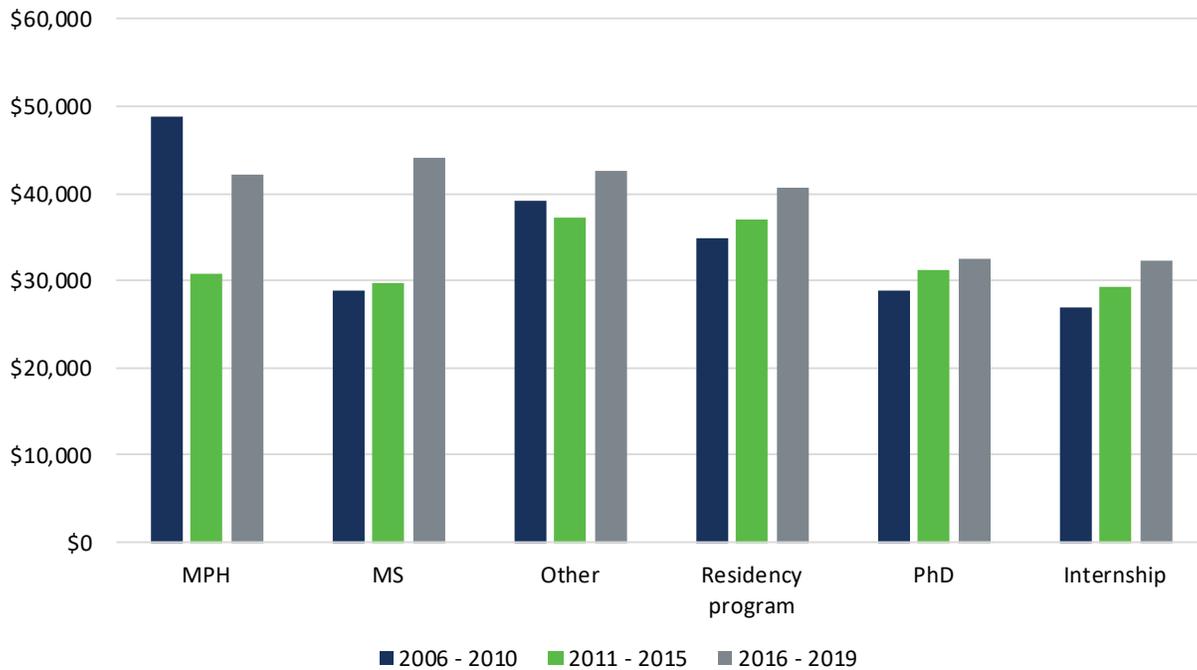
Despite being the highest-compensated public practice sector of the last decade (\$91,000 in 2019), industry has experienced a \$23,400 decline in mean starting salaries within the last year (Figure 7). Although this decline is significant, it is difficult to assess market conditions since fewer than five students report finding full-time positions in industry each year. College and university positions (as faculty or staff) also experienced a decline (\$19,000), resulting in a 2019 average salary of \$31,580, but the sample size here was only six students. All other sectors within public practice saw salaries increase between 2018 and 2019. Not-for-profit had a \$10,000 mean salary increase, landing at \$80,300 in 2019. For the first time in the last two decades, mean starting salaries of those in state or local government crossed \$90,000. Salaries in uniformed services and federal government remained below \$80,000.

FIGURE 7: PUBLIC PRACTICE AVERAGE SALARY



Compensation levels for advanced education positions (graduate assistantships or stipends) ranged from \$30,000 to just below \$50,000 (Figure 8). In 2019, master’s programs awarded new veterinarians stipends between \$42,000 and \$48,000, while the mean earnings for internships were just over \$34,000.

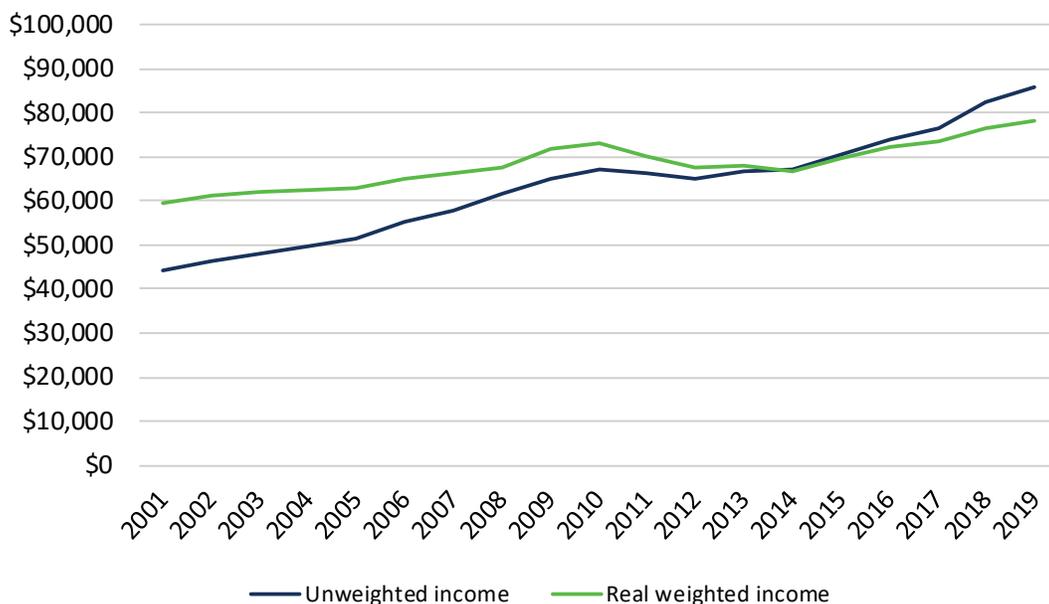
FIGURE 8: AVERAGE STARTING SALARY FOR ADVANCED EDUCATION



Numerous factors affect starting salaries independent of the economy. Starting salaries can be influenced by the number of new veterinarians opting to pursue internships, a change in the gender distribution among new veterinarians, variation in the distribution of practice types new veterinarians pursue, and a change in the location trends where new veterinarians pursue employment. To accurately identify the trends in starting salaries impacted only by economic factors (general economic growth, the quantity of veterinarians supplied), an index is created to control for all other factors (changes in demographic characteristics, inflation).

The real weighted mean income Index (RWI) depicts salary of veterinarians independent of demographic changes that may occur within the population (gender distribution, practice, location, etc.) while adjusting for inflation. Between 2018 and 2019, the RWI of new veterinarians finding full-time employment increased from \$76,633 to \$78,412 in 2014 \$s (Figure 9). The unweighted mean income of veterinarians finding full-time employment in 2019 was \$86,031, up from \$82,425 in 2018. This may not entirely be representative of increased demand; it also may reflect an increase in the proportion of veterinarians selecting higher-paying categories such as in urban areas or the companion animal predominant sector.

FIGURE 9: WEIGHTED AND UNWEIGHTED INCOME



Each year, starting salaries for new veterinarians increased by an average of \$1,691.

There are several factors that explain the variation in income, including demographic factors, terms of employment, and industry. It's important to note that the explanatory power of the selected model describes an association between selected variables and income, and not a causal relationship; other models that would attribute causality are not defined in this paper. The following describes the association of several demographic variables with starting salaries as identified by analyzing starting salaries through a modeling technique called multiple linear regression (Appendix C).

As estimated by the model, each year starting salaries increase by an average of \$1,691. Being female is associated with, on average, \$2,639 less income, and each additional \$1,000 of debt incurred is associated with a \$5 premium in salaries. This is certainly not to imply that if you incur more debt your employer will pay you higher wages, this relationship is not causal but correlated. We can hypothesize that perhaps individuals with higher debt levels negotiate higher salaries (\$5 more for every additional \$1,000 in debt) to ensure they earn a living wage while maintaining loan repayments, or they receive more offers and select the highest, but other hypotheses may also be plausible.

Among the categories represented – the practice type (private, public or advanced education), the region, and the type of community – each has a comparison group with a baseline salary. In other words, the impact of each category is measured by comparing salary differences of subcategories.

When looking at practice type, incomes of all the other practice types are compared with those in companion animal exclusive. As compared to those securing full-time positions in the companion animal exclusive sector, new food animal exclusive veterinarians earn approximately \$5,952 more, and those in industry earn \$13,995 more, while those in mixed practice earn \$3,985 less. New veterinarians pursuing continuing education and those pursuing an internship or residency earn, on average, \$30,000 to \$50,000 less than new veterinarians employed full-time in the companion animal exclusive sector.

The employment types associated with the lowest level of income among those securing full-time employment are college/university (employment as faculty or staff) and equine. These groups earn an average of \$40,057 less and \$23,926 less, respectively, than those securing full-time employment in the companion animal exclusive sector.



New veterinarians on the West coast (region 9) reported the highest starting salaries, averaging \$4,366 more than those in the Southeast (region 3).

For regions, identified by the first number in the area's ZIP code, incomes of each region are compared to those in region 3 (Southeast). For example: new veterinarians finding full-time employment in region 1 earn an average of \$2,425 more than new veterinarians in region 3; new veterinarians in region 5 earn on average \$2,501 less than in region 3; and there was no significant difference between the compensation of new veterinarians in region 4 as compared to region 3. Graduates securing employment in region 9 secured the highest starting salaries, earning an average of \$4,366 more than those securing employment in region 3, after controlling for all other factors estimated.

Considering the type of community, incomes awarded to those in urban or rural communities are compared with those in suburban communities. New veterinarians finding full-time positions in rural communities earn on average \$3,266 less than new veterinarians finding full-time positions in urban or suburban communities. There was no significant difference in income of those securing employment in urban communities versus suburban communities.

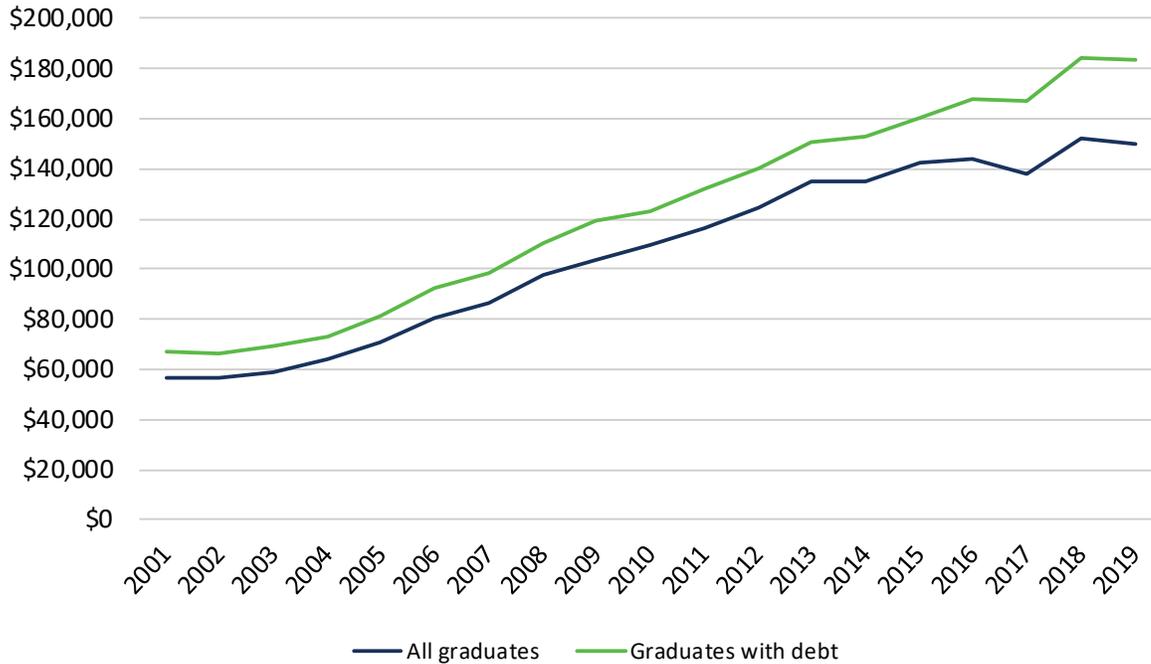
Each additional hour of work is also associated with a reduction of income of \$107 per hour. This may seem counterintuitive, but one explanation is that those in internships report expecting to work 10-20 more hours than those in full-time employment. So the model associates higher hours with internship salaries, which are significantly lower than the salaries of those securing full-time employment.

The explanatory power of the model is 76.3% – meaning that 76.3% of the variation in the starting salaries of new veterinarians could be explained by the variables identified in the model. The model, however, could not explain 23.7% of the variation in starting salaries. This is likely attributable to character traits and attributes of the individual.

New veterinarian debt levels

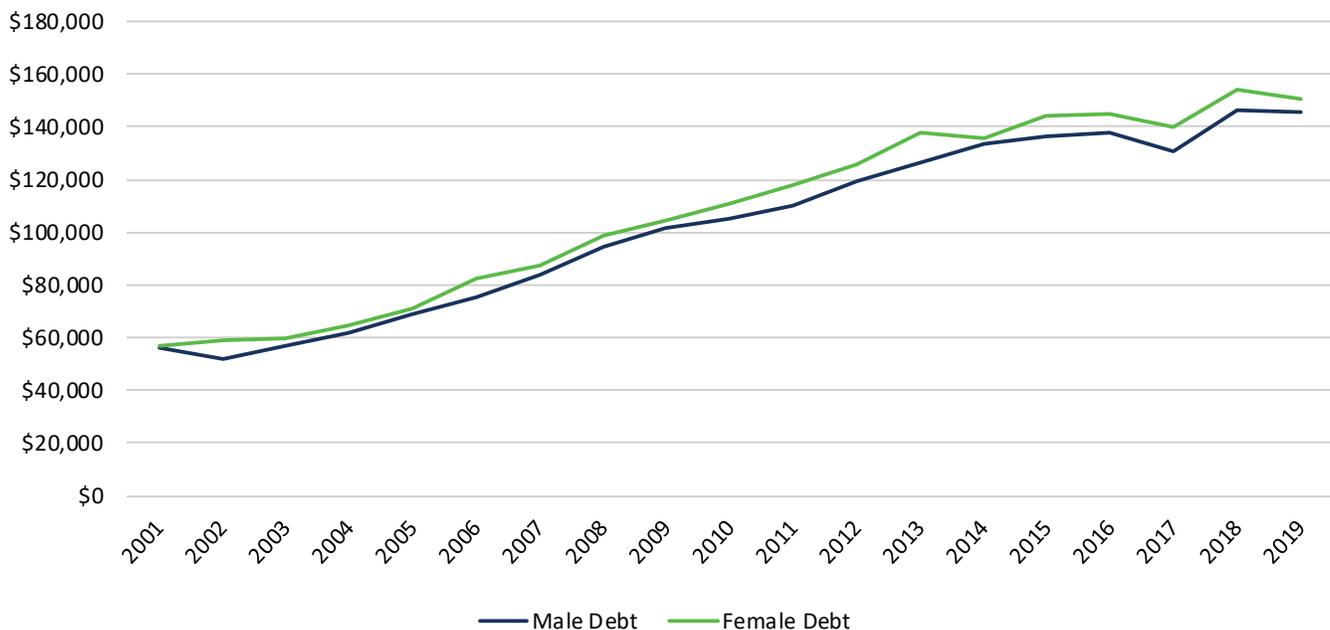
Debt incurred during veterinary school decreased in 2019, due to a larger portion of students graduating with no debt. The mean debt incurred during veterinary school by all 2019 graduates was \$149,877, down \$2,481 from the mean of \$152,358 in 2018 (Figure 11). When removing respondents with no debt, the mean level of debt incurred increases to \$183,302.

FIGURE 11: AVERAGE DEBT OF NEW GRADUATES



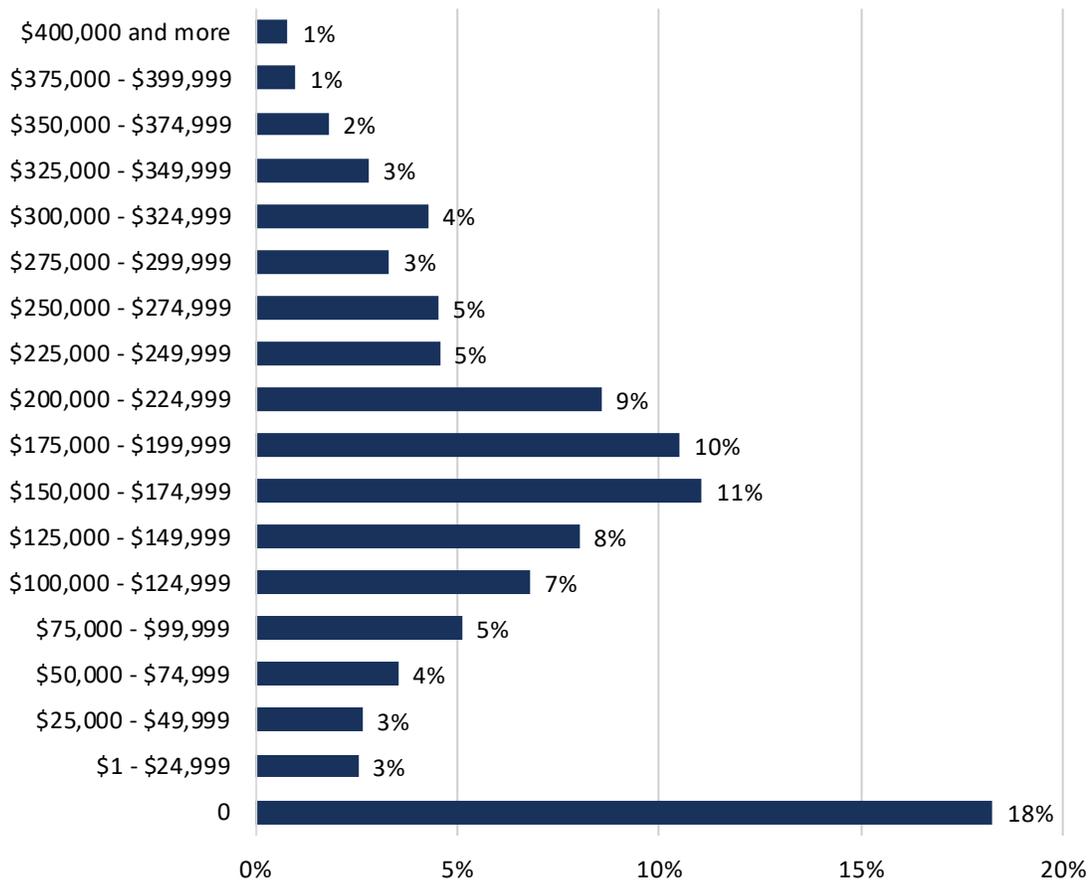
This debt also varied by gender, with female graduates incurring more debt (\$150,849 average) than their male peers (\$145,940 average) in 2019 (Figure 12). This gap has begun to close as observed between 2018 and 2019, when mean debt of male graduates declined by \$360 while mean debt of female graduates declined by \$2,953. It's important to note that debt incurred from undergraduate programs was not included in these calculations.

FIGURE 12: AVERAGE DEBT BY GENDER



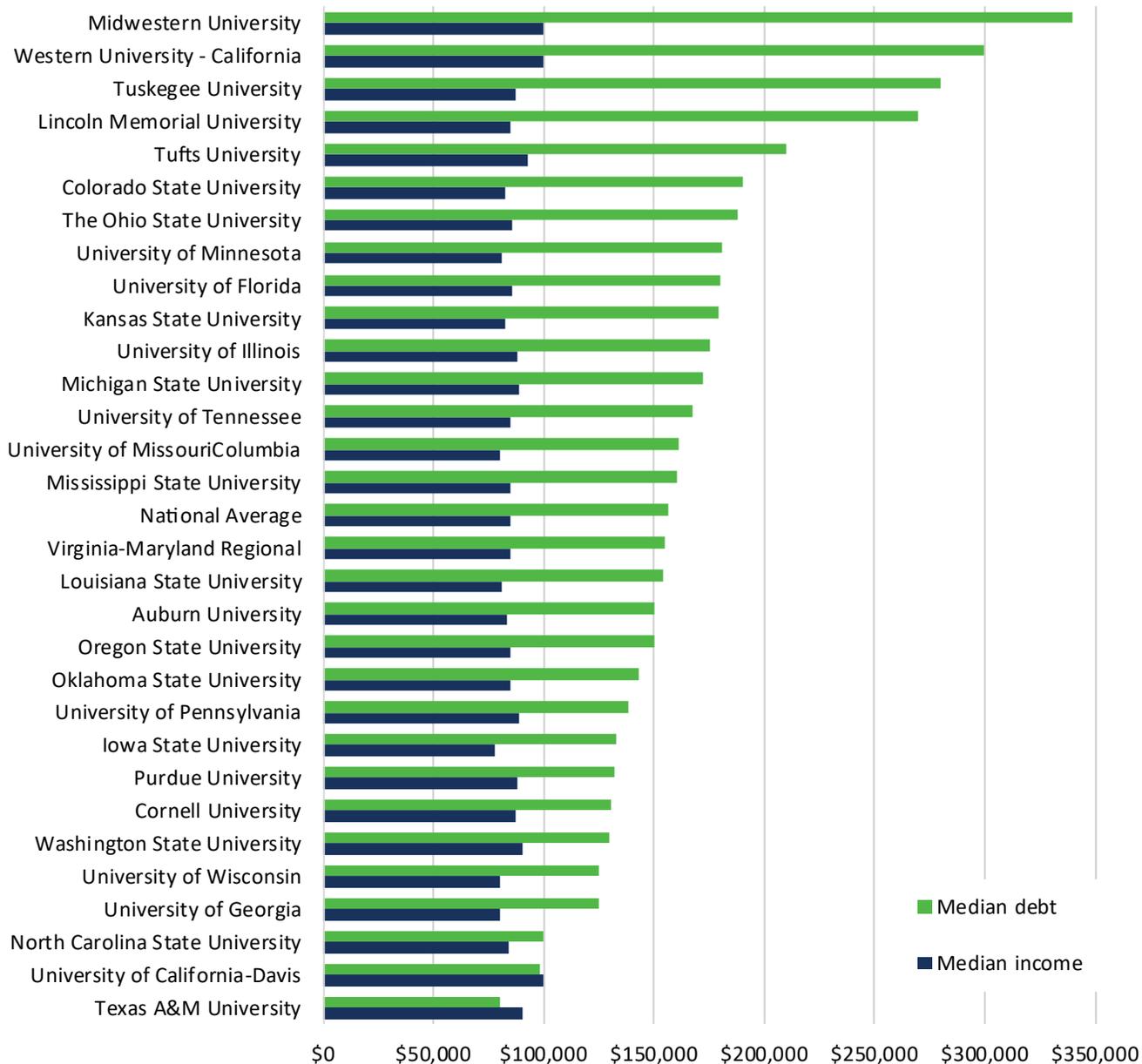
Although the mean debt of the 2019 graduating class was \$149,877, the distribution of debt varied widely. Respondents with lower debt levels increased in 2019, with 18.2% of the class graduating with no debt, up from 17.3% in 2018 (Figure 13). Additionally, 23.4% graduated with less than \$50,000 in debt, up from 22.1% in 2018; and 10.7% of 2019 graduates reported graduating with over \$300,000 in debt, a value not significantly different from the 10.3% reporting the same in 2018.

FIGURE 13: DISTRIBUTION OF DEBT AMONG 2019 GRADUATES



To assess the distribution of student debt across schools, we examined the median debt of graduates by veterinary college (Figure 14), and the results are staggering. While the median debt across all schools in 2019 decreased to \$156,597, debt levels varied significantly between schools. Median debt levels ranged from \$80,000 to \$340,000 across schools, a difference of \$260,000. At the low end, Texas A&M graduates had a median debt level of \$80,000. At the high end, Midwestern University students incurred a median debt level of \$340,000. To add further perspective to this distribution, in 2019, 50% of Texas A&M veterinary students graduated with less than \$80,000 in debt, while 50% of veterinary students at Midwestern University graduated with over \$340,000 in debt. These debt levels are statistically significant, especially when compared to median starting salaries. The median starting salary across schools is lower and smaller in range, as low as \$77,750 for Iowa State University graduates and up to \$100,000 for both UC Davis and Midwestern University, a range of about \$22,250.

FIGURE 14: MEDIAN DEBT AND FULL-TIME INCOME OF 2019 GRADUATES



There are several factors associated with varying levels of debt (Appendix E). These include the location of the school, levels of tuition, and demographic factors of the student. Females had on average \$6,900 more debt than male graduates, and non-residents graduated with over \$35,000 more debt than residents.

To estimate the impact of tuition levels, tuition was divided into four categories: very low tuition (more than two standard deviations below the mean tuition); low tuition (within 2 standard deviations below the mean tuition); median tuition (within two standard deviations above the mean tuition); and high tuition (above two standard deviations above the mean tuition). Very low tuition was used as the comparison point with which to gauge other tuition levels. Graduates of schools in the high tuition category had, on average, \$76,189 more debt than those in the low tuition category. Those in the median tuition category had \$65,456 more debt than those in the very low tuition category.

The region of the school is the first number of the ZIP code in which the school is located. Region 3 was used as the comparison variable. Graduates of schools located in regions 4, 5 and 6 incur \$19,985, \$11,169 and \$17,944 more debt, respectively, than those graduating from veterinary colleges in region 3. Graduates of schools in regions 7 and 9 incur \$13,412 and \$3,945 less debt, respectively, than those in region 3.

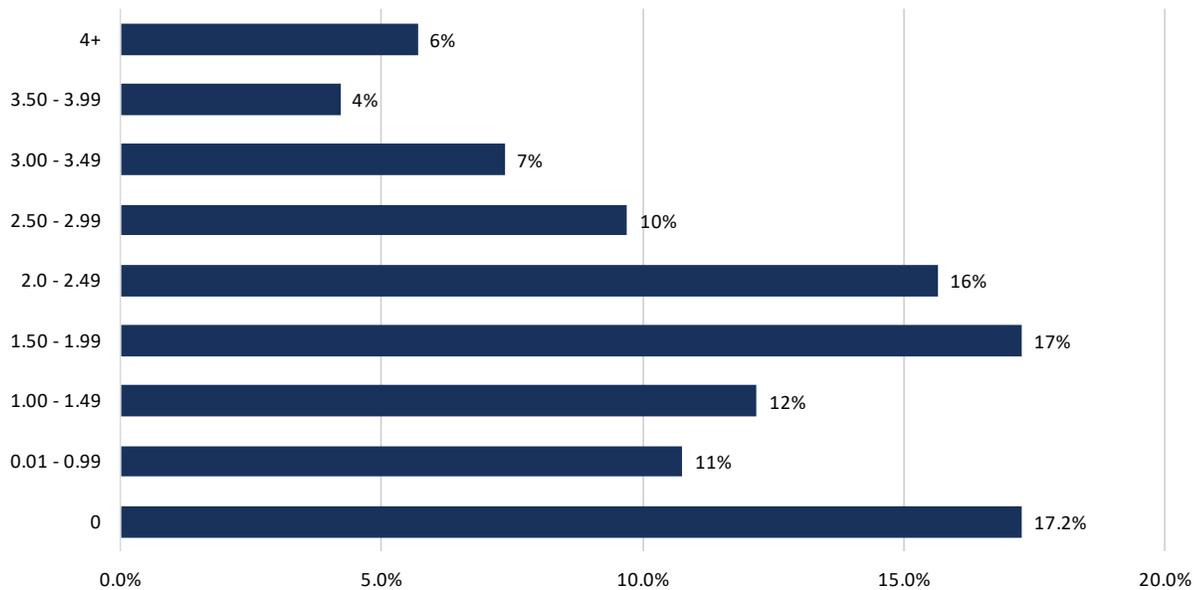
Although this regression succeeded in explaining less than 20% of the variation in debt levels, other factors that likely explain the variation in debt (but are unaccounted for in this regression) are the distribution of scholarships, grants, working while in school, and family support.

For more detailed information, see Appendix E.

Debt-to-income ratio

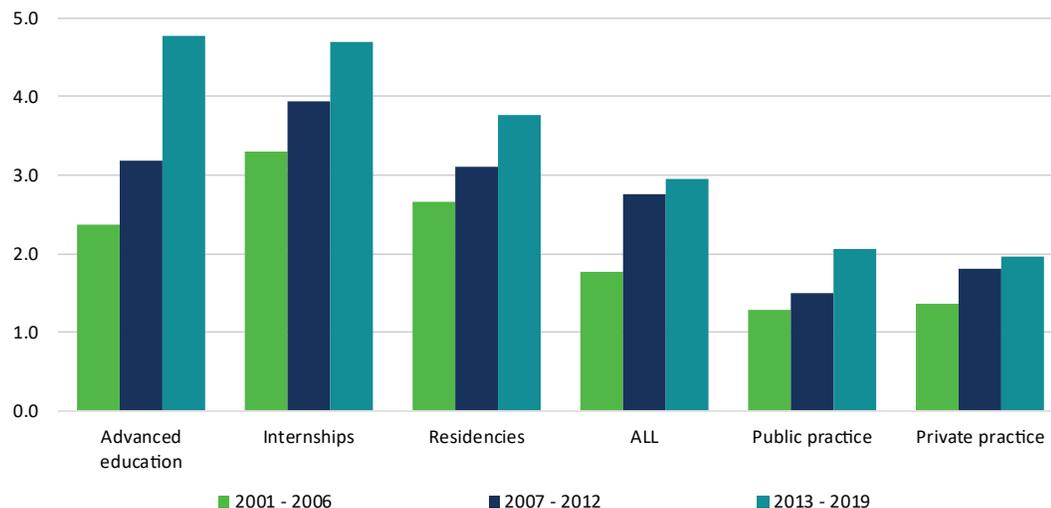
The debt-to-income ratio (DIR) is an important measure of the economic performance of the market for veterinary education. It ties together the market for education and the market for new veterinarians, and measures what percentage of debt is covered by annual income. The average DIR for 2019 graduates with full-time employment offers was 1.84 (unweighted). Among these graduates, 17.2% had a DIR of 0, 28.0% had a DIR of 1.0 or less, and 17.2% had a DIR over 3.0 (Figure 16).

FIGURE 16: DIR OF 2019 GRADUATES WITH FULL-TIME EMPLOYMENT



The variability of debt-to-income ratio (DIR) can most plainly be identified among postgraduate plans to pursue public practice, private practice, internships, residencies, and other programs in advanced education. The mean DIR of graduates decreased between 2018 and 2019, dropping from 1.93 to 1.79 for private practice, and 2.08 to 2.03 for those pursuing public practice (Figure 17). Although we can estimate a DIR for individuals pursuing internships, residencies and continuing education, it is not a justifiable measure since the compensation or stipend they receive is not representative of the earning potential of a new veterinarian.

FIGURE 17: DEBT-TO-INCOME RATIO BY POSTGRADUATE PLANS

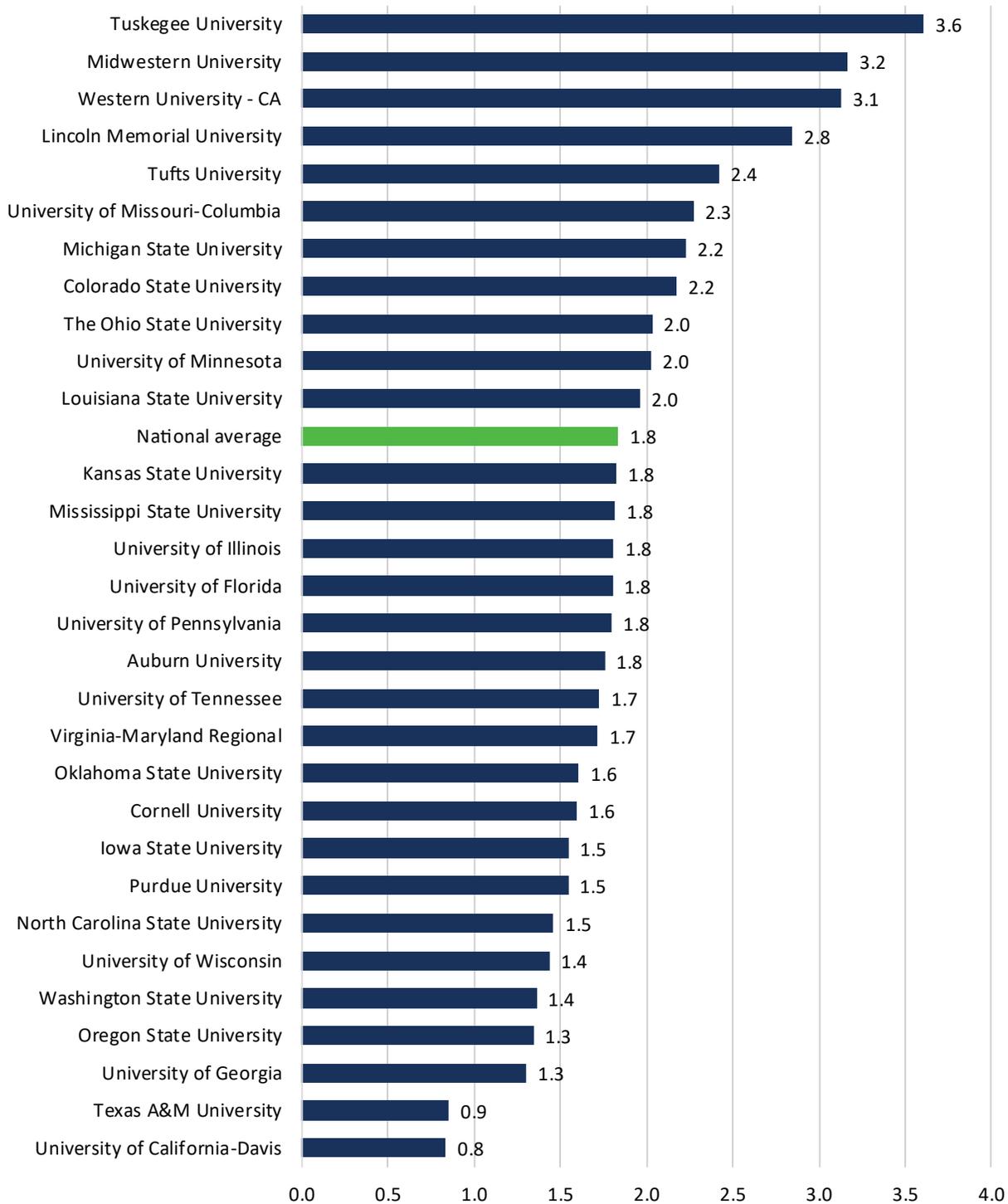


There are several factors that explain variability in DIR, such as gender, age, hours expected to work per week, location of new postgraduate position, practice type, tuition category, and university (Appendix F). Every year the DIR increases by approximately 0.052, and older graduates have slightly higher DIR (0.06) than their peers. Women, graduates without children, non-residents, and those working long hours all have higher average DIR (0.167, 0.048, 0.779, and 0.028 increases, respectively). Graduates in the West Coast were the only region to have different DIR with a decrease of -4.66. All employment types except college or university positions influenced DIR. For practice type, companion animal predominant has the highest DIR, while uniformed services has the lowest DIR (Appendix F).

One of the most influential and significant variables for DIR is what university a student attended. Considering only graduates who reported debt and income for full-time employment, the mean DIR across schools ranged from 0.8 at UC Davis to 3.6 at Tuskegee University (Figure 18). Of the 30 veterinary colleges, 19 graduated new veterinarians with a mean DIR of less than 2.0. Eight had graduates reporting a mean DIR between 2.0 and 3.0, and three colleges had a mean DIR of over 3.0. The three schools with highest DIR, net of other factors (and statistically significant), were: Western University-CA (mean DIR of approximately 1.33 more), University of Minnesota (mean DIR of approximately 0.31 more), and Midwestern University (mean DIR of approximately 1.31 more.).



FIGURE 18: MEAN DIR BY SCHOOL ATTENDED



Summary

The market for new entrants into the veterinary profession is robust, with over 94% of new veterinarians in 2019 reporting having found full-time employment or opportunities to continue their education up to two weeks prior to graduation. Additionally, total average student loan debt has decreased, and zero-debt graduates hit an all-time high.

Although this is heading in a positive direction, opportunities remain to further strengthen the situation. To do this, continued work is needed to battle both increasing debt levels and pay gaps. Student debt remains a relevant and significant issue among new graduates. Reducing the amount of student loan debt, especially at extremely high levels (\$300k+) will strengthen and preserve the profession for decades to come. The distribution of student debt across colleges (\$90,000 to \$340,000) presents an opportunity for colleges to communicate horizontally and share successful strategies to reduce student loan debt (financial counseling, need-based scholarships, etc.). Additionally, continued conversations among education, government, and industry are needed to tackle these issues head on by identifying and implementing tactics to reduce debt.

Although salary continues to increase, disparities exist that, if removed, would further strengthen the profession. Women continue to earn less than their male peers, despite entering the profession in larger numbers. Continued focus on reducing the pay gap is needed, along with education on salary negotiation and the development of policies supporting equitable pay. Average salary for the public sector has decreased, indicating an increased need for programs such as loan forgiveness for public servants.

Further investigation is necessary and underway to understand the unique challenges the profession is facing. The information provided in this report can be used as a primer to start and continue conversations to address these learning opportunities directly. Together, our veterinary community can move forward to further strengthen the profession.



THE MARKET FOR VETERINARIANS

The market for veterinarians continues to see signs of positive economic movement. 2019 showed positive indicators of a robust veterinary sector with low unemployment and increased incomes. The veterinary profession has also gone through some significant economic and demographic changes. High student debt continues to be a burden among veterinary school graduates (see the Market for Veterinary Education, above), and mental health and wellbeing are a top priority to address in the profession. In addition, changing work preferences require a shift in tactics for retaining talent as more veterinarians continue to want to work fewer hours for lower compensation, compared with veterinarians wanting to work more hours for more compensation. The market for veterinarians includes examination of topics such as income, hours working in the practice, the job market, labor mobility, and veterinary wellbeing.

Methodology

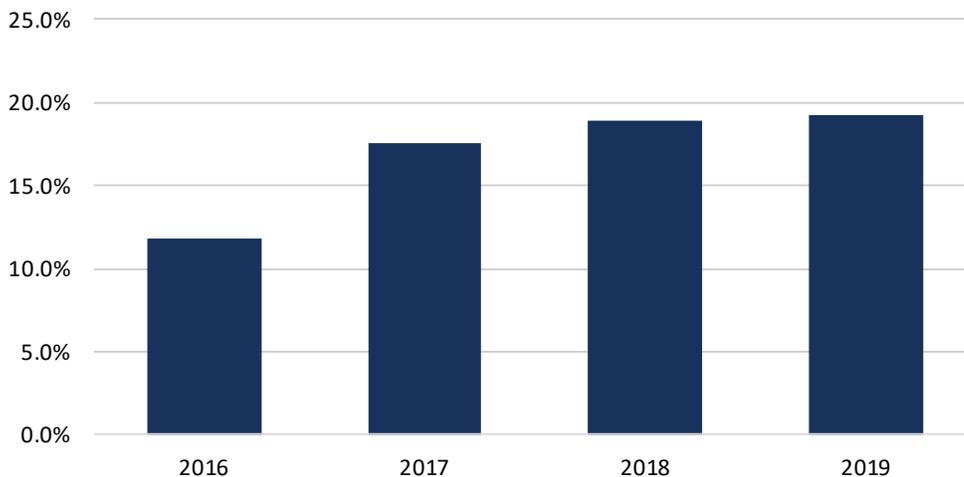
The data referenced in analyzing the market for veterinarians comes primarily from the AVMA Census of Veterinarians, an annual survey that collects information on work history, compensation and benefits, and other aspect of a veterinarian's work. The survey was distributed to AVMA member veterinarians between March and May 2019, gathering data from the previous year on the economics of veterinary practice and veterinary compensation. Sometimes the Census of Veterinarians is compared with AVMA membership data, and this is indicated in graphs and tables where appropriate.



**This year's response rate is 19.2% -
78.3% of respondents were women**

The response rate for the 2019 Census of Veterinarians was 19.2%, an increase from previous years – an excellent positive trajectory (Figure 19). Respondents represented veterinarians across the profession by practice type and career length (Appendix G). A higher percentage of females (78.3%) than males (21.7%) responded to the survey as compared to the gender distribution found in the profession (62.8% female and 37% male). The higher percentage of female respondents corresponds to the higher number of early-career veterinarians responding, as the majority of these early-career veterinarians are female.

FIGURE 19: AVMA CENSUS OF VETERINARIANS RESPONSE RATES



Survey responses include information from a variety of locations (Table 1), which are broken down by U.S. region. These indicators are presented on a broader scale throughout this section to show variation across geographies. As with other analysis in this report, U.S. regions are based off U.S. ZIP codes, with the first number in a five-digit ZIP code corresponding to its region (Appendix H).

TABLE 1: MEMBERS, RESPONDENTS, AND POPULATION BY U.S. REGION

	2019 Census of Veterinarians	2019 AVMA membership	U.S. population (est. 2019)
Region 0	6.1%	8.2%	7.2%
Region 1	8.4%	9.0%	10.1%
Region 2	11.6%	11.2%	10.0%
Region 3	12.6%	13.9%	14.3%
Region 4	9.9%	9.9%	10.0%
Region 5	8.6%	7.3%	5.3%
Region 6	8.1%	7.9%	7.2%
Region 7	9.2%	11.0%	12.4%
Region 8	8.7%	8.2%	7.2%
Region 9	15.6%	13.3%	16.3%

Incomes reported in this section are based on responses from veterinarians who earned less than \$500,000 in 2018.

Veterinarians who earned more than \$500,000 were outliers for this analysis, as these observations would artificially decrease or increase the overall average. \$500,000 was chosen because 95% of incomes equaled or fell below this number.

Unemployment rates were calculated only for veterinarians who were actively seeking employment in 2019 at the time they filled out the survey. This estimate better aligns with the U.S. Bureau of Labor

¹ Data source: United States Census Bureau

Statistics' (BLS) estimates of unemployment. Underemployment can occur when a worker is not working as many hours as he or she would like. As measured in total hours, underemployment represents the number of hours that veterinarians desire to work above what they are currently working for more compensation, versus the number fewer hours they desire to work for less compensation. This was measured as the desire to increase/decrease hours worked for an equivalent increase/decrease in compensation.

Data for the veterinary labor market was collected from the AVMA's Veterinary Career Center (VCC), the Conference Board's Help Wanted OnLine (HWOL) data series, and Bureau of Labor Statistics (BLS) unemployment data.

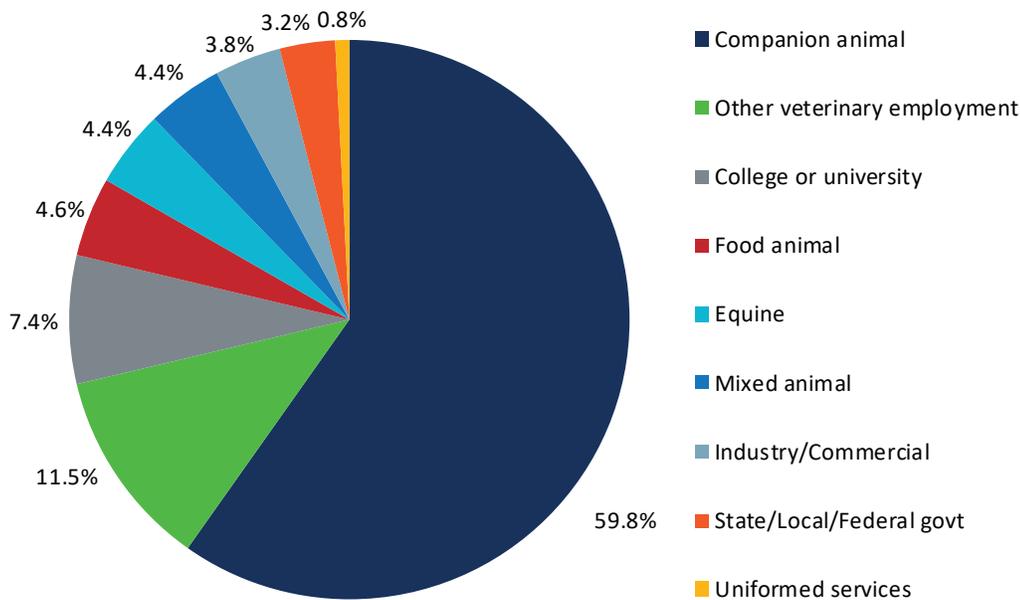


New veterinarians on the West coast (region 9) reported the highest starting salaries, averaging \$4,366 more than those in the Southeast (region 3).

The profession

In 2019, an estimated total of 116,091 veterinarians were actively engaged in the profession in the United States, in public or private practice. The largest segment of these veterinarians provide medical services to animals in private and corporate practices. Of these practices, companion animal practices employed the largest number of veterinarians. In public practice, colleges and universities employed the most veterinarians (Figure 20).

FIGURE 20: VETERINARY POPULATION BY PRACTICE TYPE

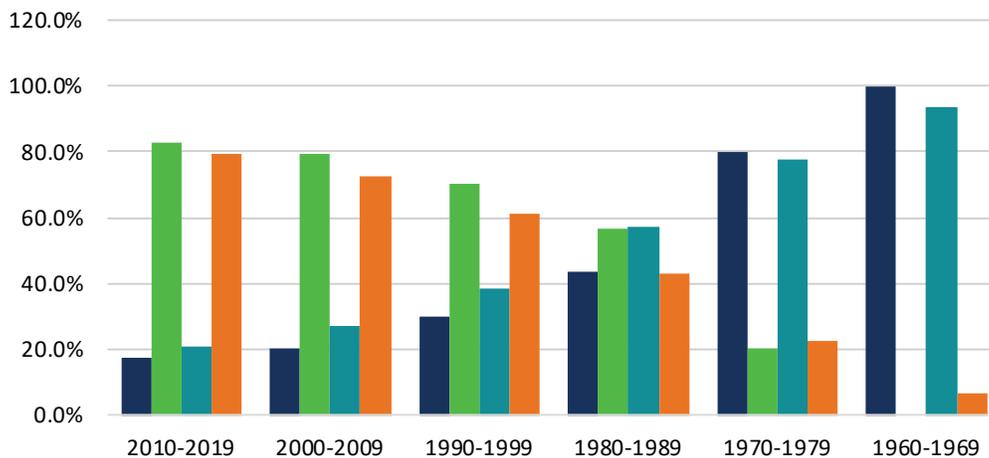


Estimated number of veterinarians as of December 31, 2019: 116,091

Source: AVMA membership data (93,593 reported their type of employment)

By looking at year of graduation by gender, one can see the gender shift start to occur in the 1980s, when AVMA membership numbers for male and female veterinarians were closer together than at other time periods (Figure 21). Since then more females have entered the profession than males.

FIGURE 21: YEAR OF GRADUATION BY GENDER



There was, however, very little difference in the distribution of respondents by veterinary college attended compared to the veterinary population (Figure 22). Over the past couple of years there has been an increase in the number of veterinarians living in suburban areas, while the number of veterinarians in rural areas has declined (Figure 23).

FIGURE 22: RESPONDENTS AND MEMBERS BY VETERINARY COLLEGE ATTENDED

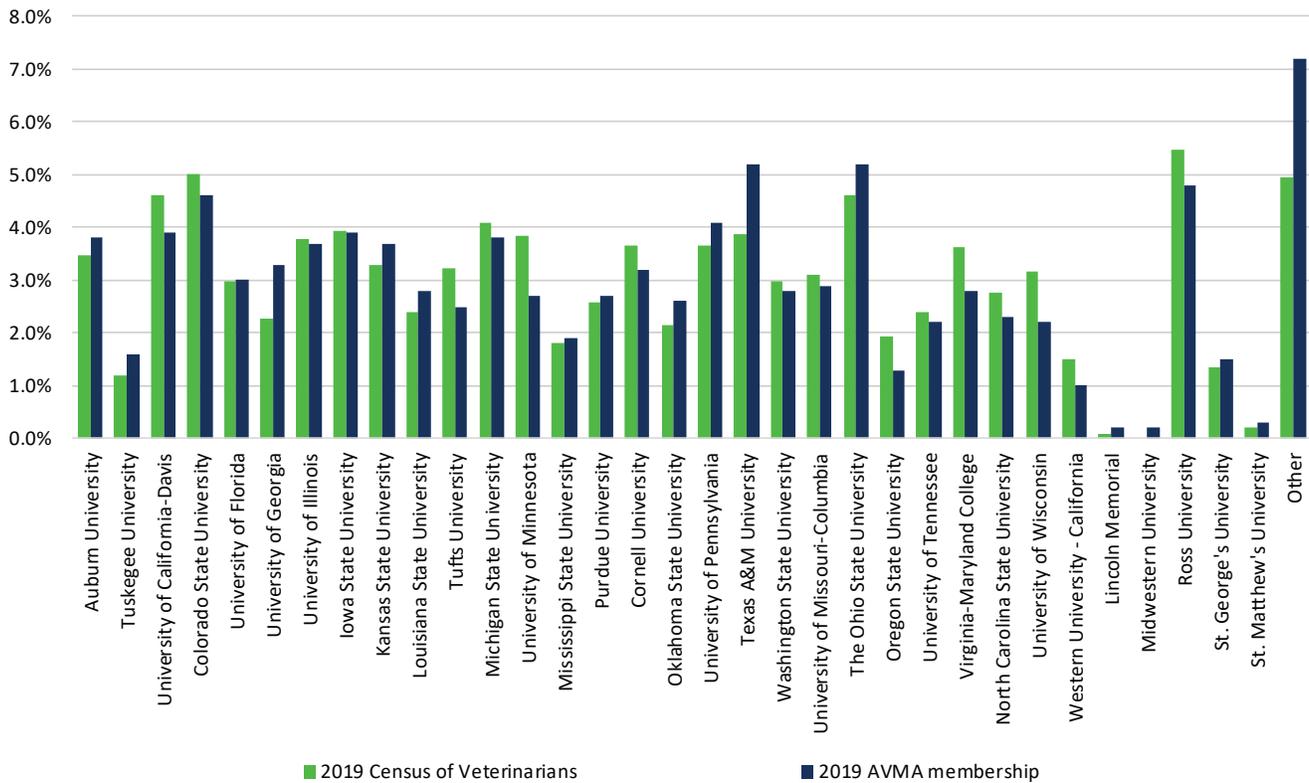
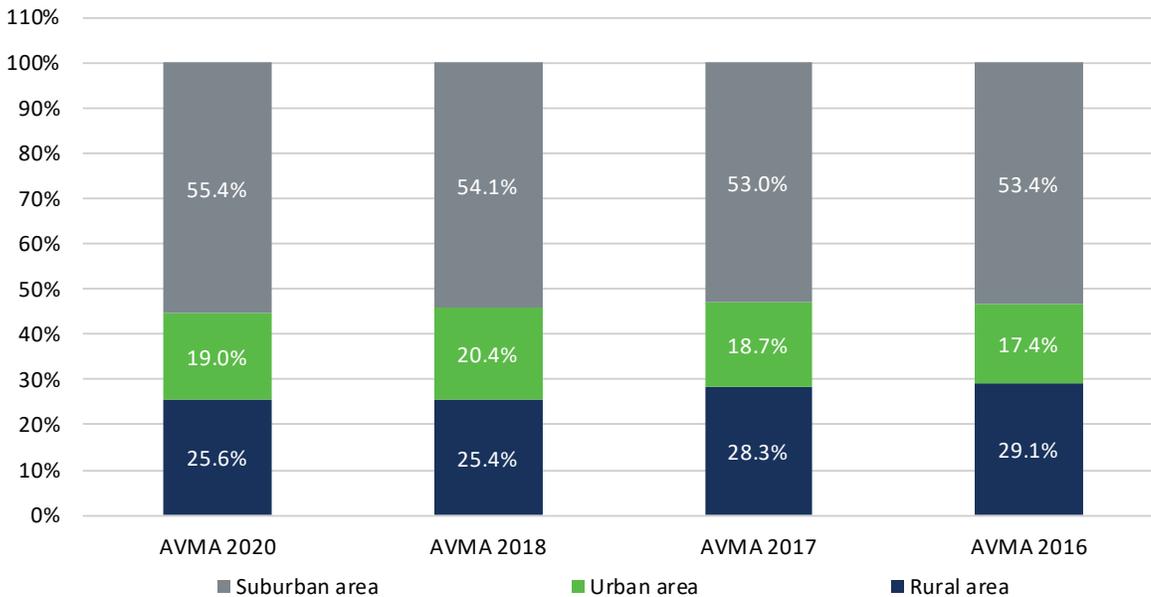


FIGURE 23: RESPONDENTS BY COMMUNITY TYPE ATTENDED



It's important to note the younger generation of female veterinarians entering the workforce. The baby boomer generation is retiring, and millennials and Generation Z are entering the workforce. This will impact the way veterinarians do business in the future. Additionally, it's important to keep in mind the high number of veterinarians in suburban areas, as this may impact overall responses.

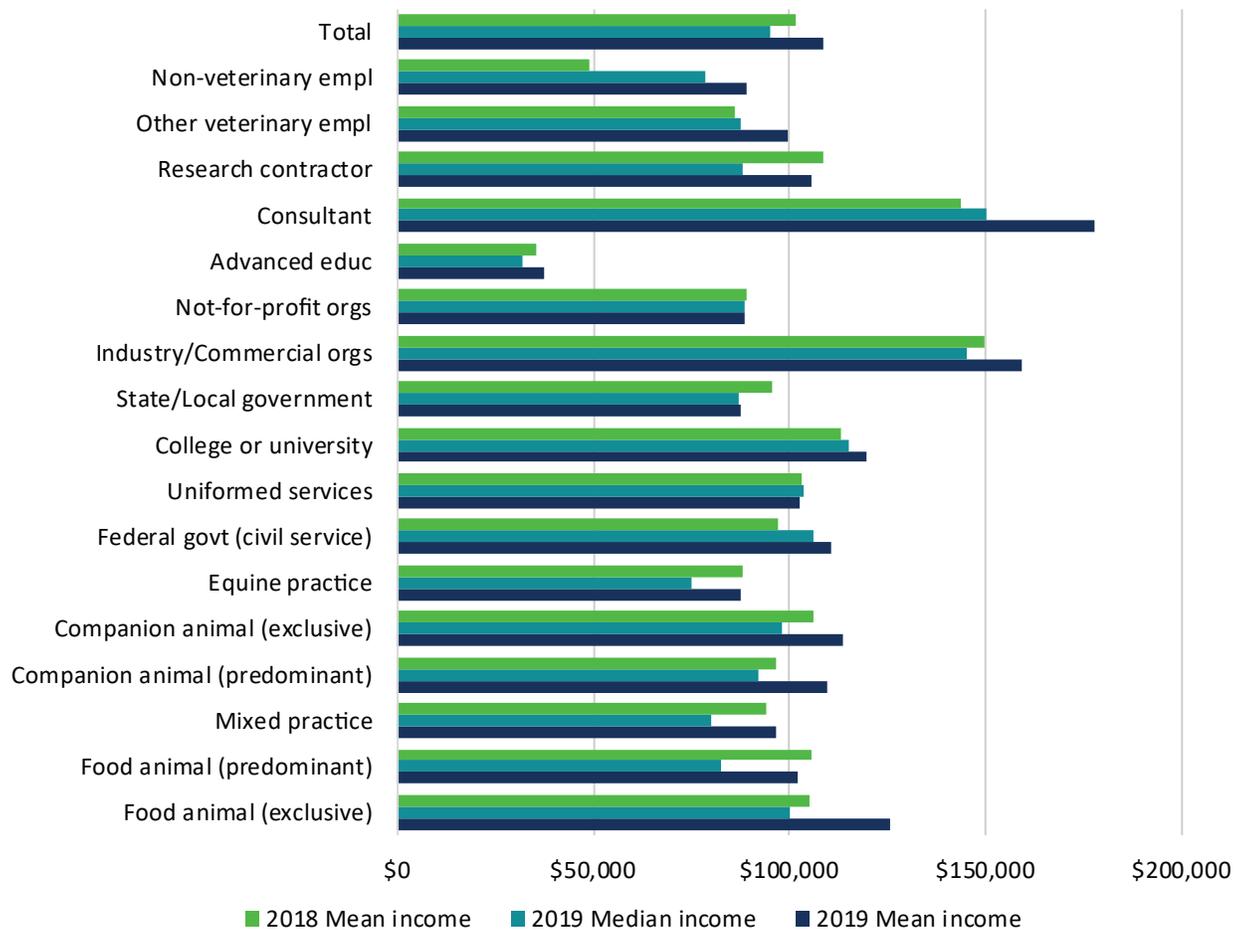


The average income of respondents was \$108,717

Compensation

In last year's report, the average income of respondents in 2018 was \$108,717 (\$101,207 in 2017). Veterinarians working 30 hours per week or more (and in this case deemed full-time workers) averaged \$111,293, compared with \$69,148 for part-time workers. The income for the national sample varies by practice type, with consultant, equine and food animal practice types having the greatest range of reported average incomes (Figure 24). Consultant and Industry occupations remain the highest paid (\$177,800 and \$159,337, respectively).

FIGURE 24: MEAN AND MEDIAN PROFESSIONAL INCOME BY PRACTICE TYPE



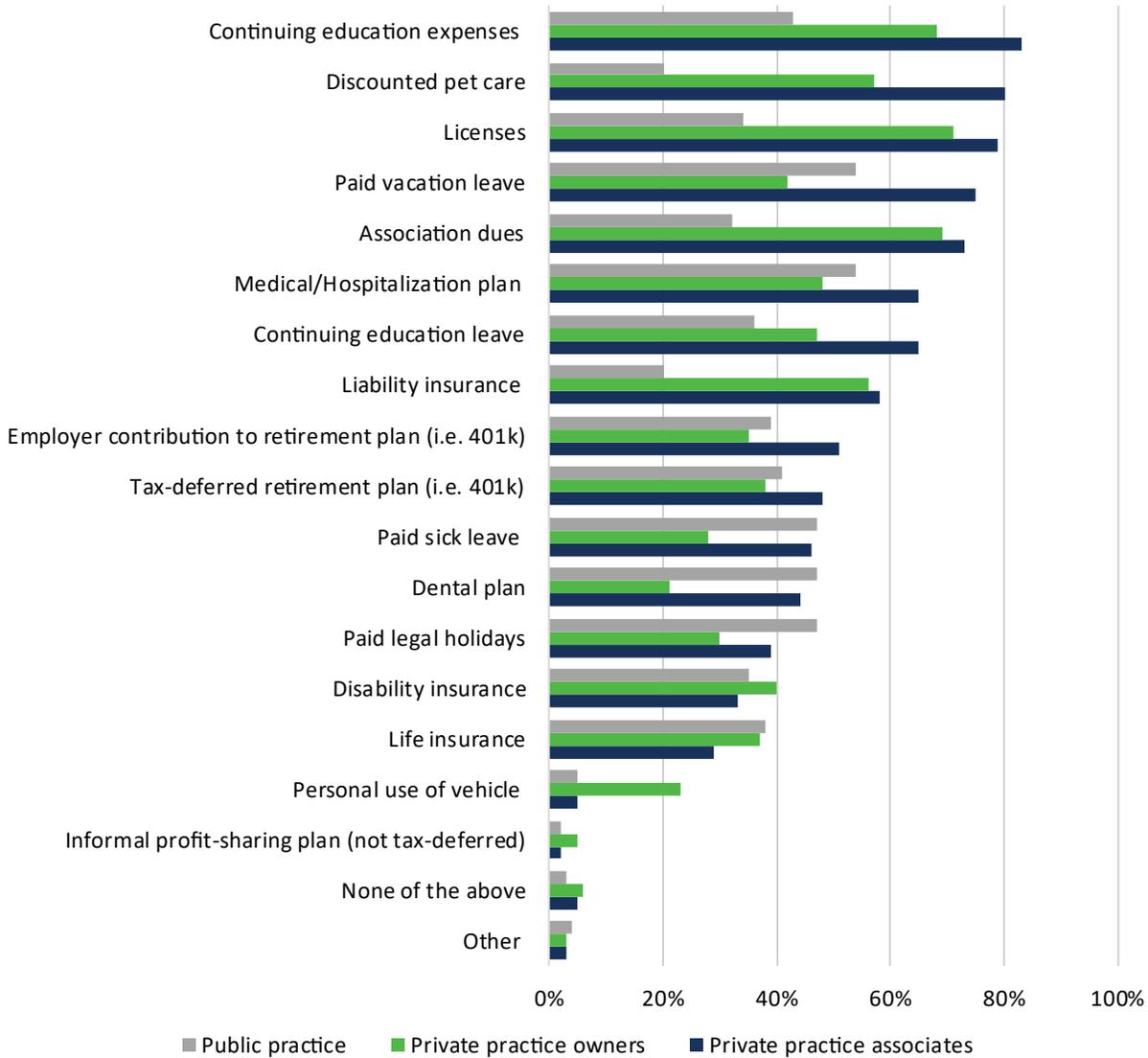
Although practice ownership is beneficial in income generation, the gender wage-gap is the largest among practice owners, resulting in lower practice-owner benefits for women (Table 2).

TABLE 2: AVERAGE SALARY BY OWNERSHIP, GENDER, AND CAREER LENGTH

	Practice associate		Practice owner	
	Female	Male	Female	Male
Early career (21-34 years)	\$87,499	\$95,620	\$117,720	\$201,875
Mid-career (35-44 years)	\$109,206	\$131,678	\$120,899	\$218,250
Late career (45+ years)	\$102,342	\$129,297	\$127,443	\$198,405

When it comes to benefits provided by the employer, over 70% of associates reported continuing education, discounted pet care, licenses, paid vacation, and paid association fees as part of their benefits package (Figure 25). Over 50% of veterinarians in public practice report having a medical/hospitalization plan.

FIGURE 25: EMPLOYER BENEFITS



Employment

The unemployment rate for the veterinary profession in 2019 was 0.8%, which is well below the 3.9% national unemployment rate reported at the end of 2019 (Figure 26). Approximately 11% of respondents currently not employed in veterinary medicine were seeking enrollment in an internship, residency or advanced education, while 52.7% were not seeking any employment at the time of the survey (Table 3).

FIGURE 26: UNEMPLOYMENT RATE

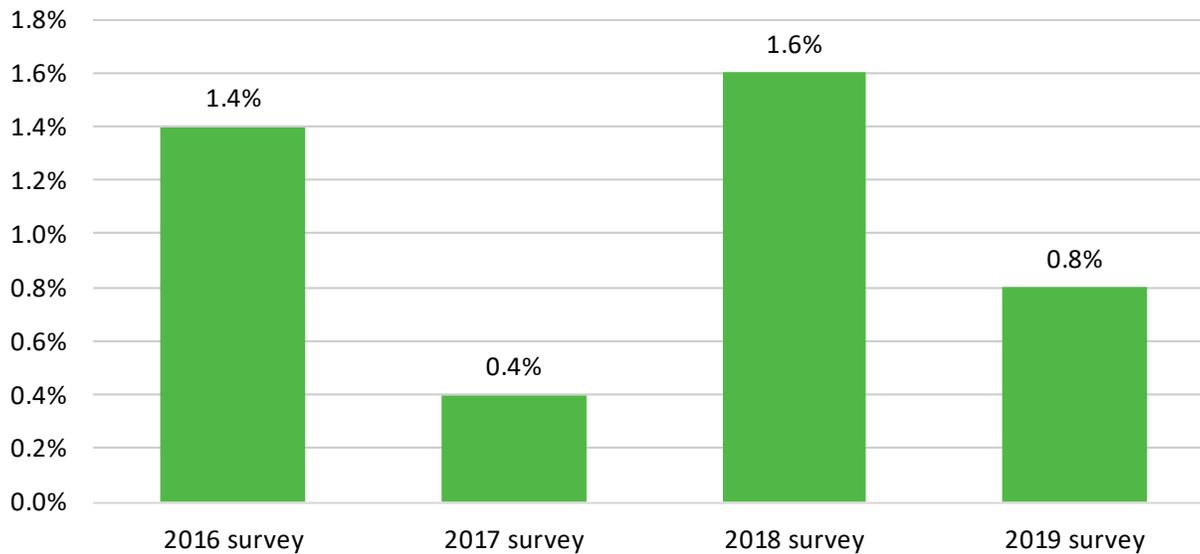


TABLE 3: UNEMPLOYED VETERINARIANS SEEKING EMPLOYMENT

If unemployed, are you seeking employment in veterinary medicine?	2016 survey	2017 survey	2018 survey	2019 survey
Seeking employment in veterinary medicine	38.8%	29.3%	30.9%	36.5%
Seeking enrollment in an internship, residency, or advanced education program	12.9%	4.9%	18.4%	10.8%
Not seeking employment (and not retired)	48.2%	65.9%	50.7%	52.7%

Underemployment was again negative in 2019, following a trend started in 2014, with more veterinarians indicating they wish to work fewer hours for less compensation than those who wish to work more hours for more compensation (Figure 27). For the fourth year in a row, both men and women were more likely to want fewer hours rather than additional hours, with women being slightly more likely to report a desire to work fewer hours (Appendix I). While not shown, we also see that veterinarians who graduated recently tend to want to work more hours, while older veterinarians desire to work fewer hours. In 2019, an additional 4,539 veterinary full-time equivalents (FTEs – 40 hours per week equals one FTE) were needed to eliminate the negative underemployment. This disparity was higher in 2018 (6,291 needed), but still higher than the number of new veterinarians needed in 2016 and 2017 (Figure 28).

FIGURE 27: HOURS WORKED PER WEEK PREFERENCE

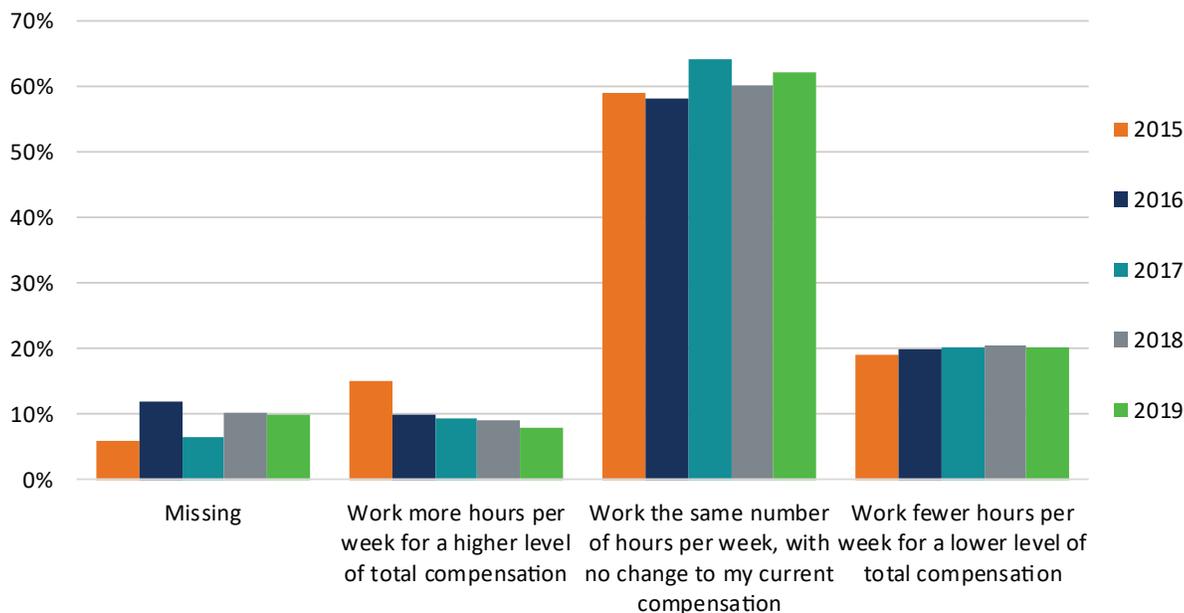
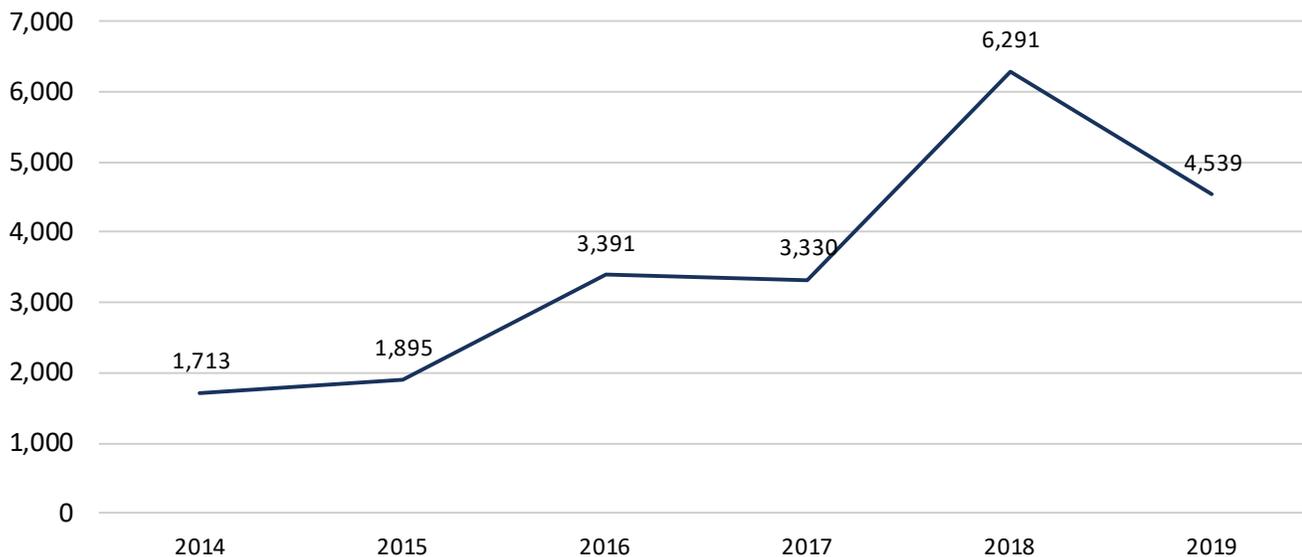


FIGURE 28: ESTIMATED VETERINARIANS NEEDED TO ELIMINATE NEGATIVE UNDEREMPLOYMENT

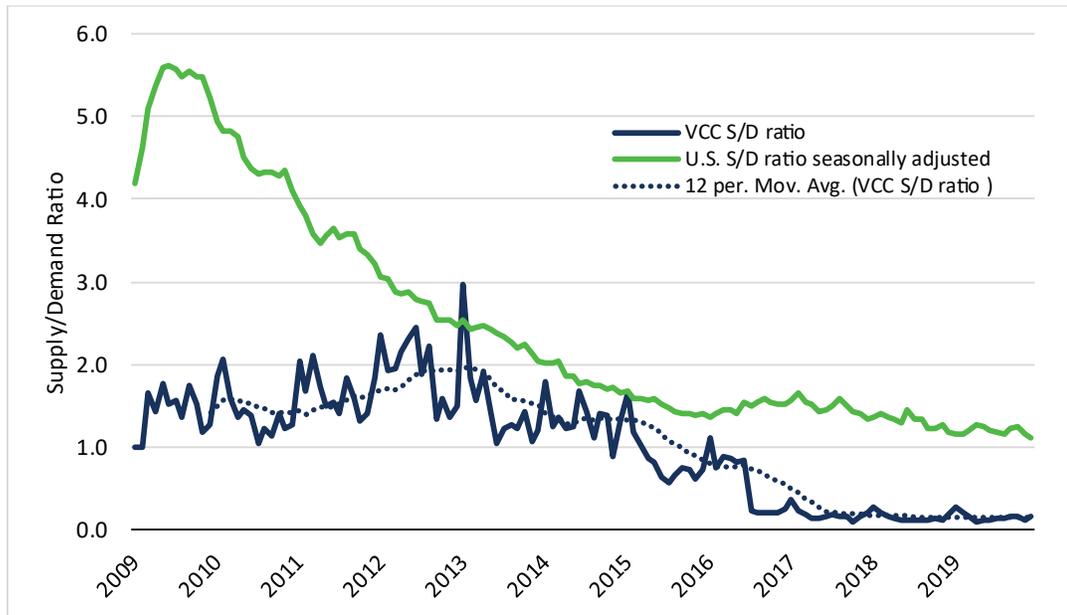


Job market

In the national labor market, the number of jobs exceeds the number of people looking for employment. A simplified measure of the national labor markets is the supply/demand (S/D) ratio. This is the number of unemployed divided by the number of jobs posted online. The S/D ratio provides an indication of the general tightness of the national labor market and indicates the extent to which the national labor supply and demand is out of balance.

At the height of the recession, there were more than five unemployed people seeking each available employment opportunity, an S/D ratio of 5:1. In late 2019, the relative scarcity of labor is high compared with what it was in 2009, with an S/D ratio of 1.6:1.0, meaning an estimated 1.6 people for every employment opportunity. A comparison of the U.S. S/D ratio (using the BLS unemployment data and the HWOL ads) and the AVMA VCC ratio (new job seekers and average searchable jobs) can be used to examine responses to economic changes. The observed pattern suggests a four-year lag between when the U.S. S/D responds and when the veterinary labor market responds. For example, the high level of U.S. unemployment observed in 2009 compared to the high veterinary industry unemployment observed in 2013 (Figure 29).

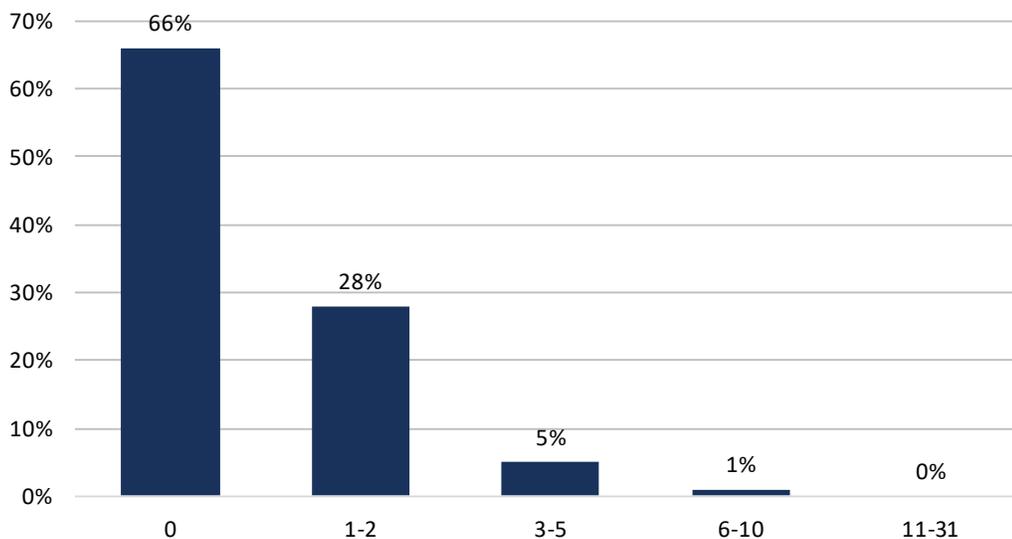
FIGURE 29: JOB APPLICANTS (SUPPLY) AND AVAILABLE JOBS (DEMAND)



Source: Conference Board's HWOL; BLS; AVMA VCC

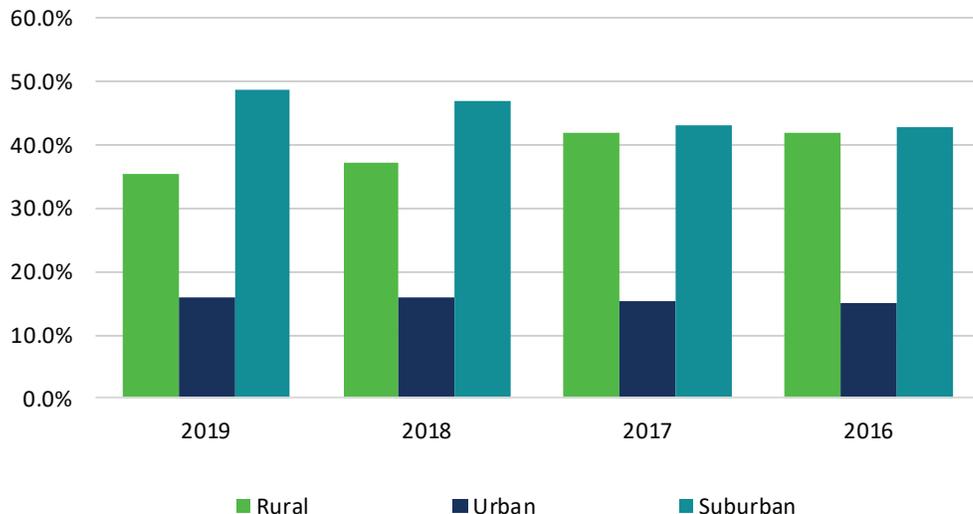
Employment opportunities on the AVMA VCC are for any veterinary service position and for any range of experience. Over 50% of jobs posted are looking for any experience level, followed by 41.5% with one to seven years of experience. Although some of the opportunities are for the various staff positions in a veterinary hospital, 94% of the posted jobs require a DVM degree, and over 90% are full-time positions. Looking at job postings in the U.S., 66% of postings have no applicants, while less than half of the remaining positions have one or more applicants (Figure 30).

FIGURE 30: NUMBER OF JOB APPLICANTS



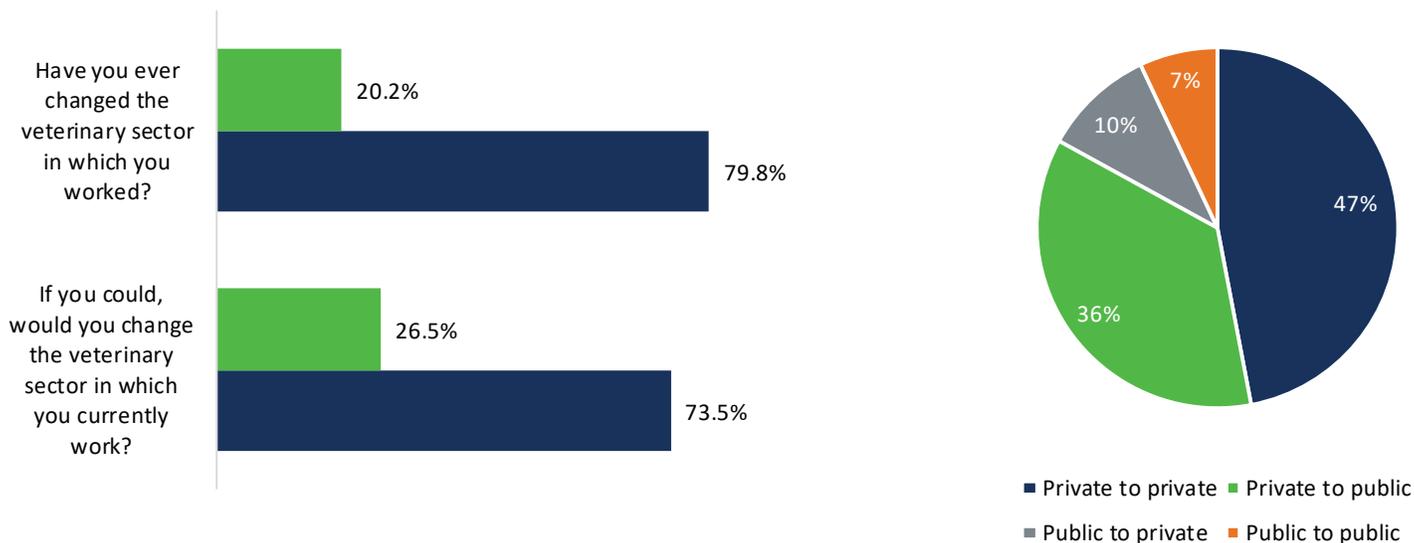
There is an increase in preference for veterinarians to seek work in a suburb or urban area, as rural area preferences decline (Figure 31).

FIGURE 31: COMMUNITY PREFERENCE



About 20% of veterinarians have changed the sector in which they worked, and currently about 27% of veterinarians desire to change the veterinary sector in which they work (Figure 32). When examining exactly what sectors respondents had switched to previously, 47% went from private practice to public practice, 36% from private practice to another private practice, and fewer than 20% went either from public to private practice, or from public to public practice (Figure 32).

FIGURE 32: MOBILITY BY SECTOR AND PUBLIC VS. PRIVATE PRACTICE



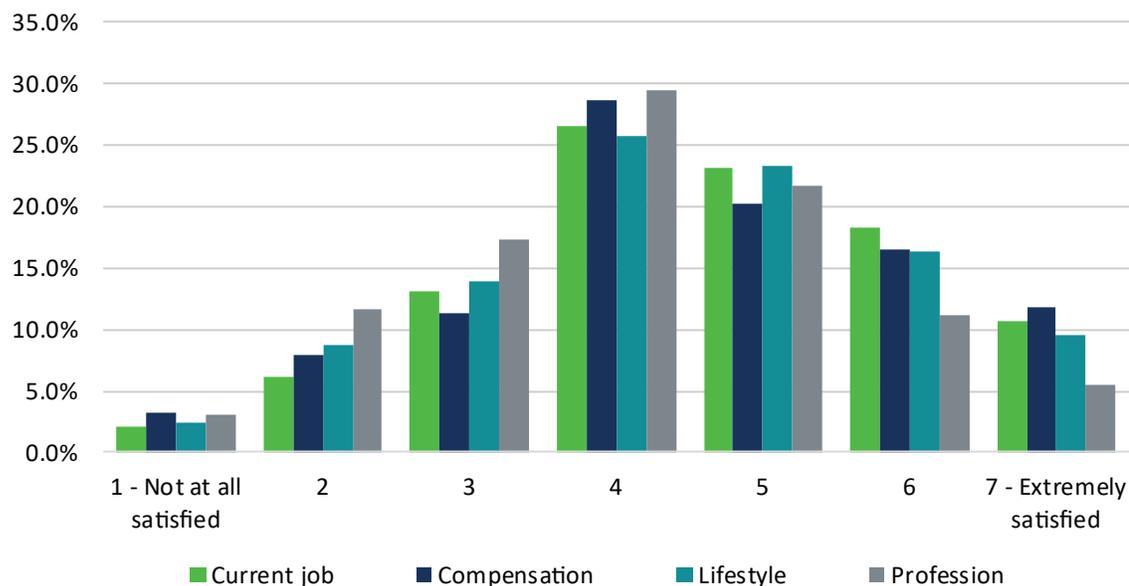
Wellbeing

It's important to know what factors are contributing to lower levels of wellbeing within the veterinary profession. To address this concern, the AVMA collects data on self-reported wellbeing of veterinarians, with the main objective being to find correlations of wellbeing with employment and demographic characteristics.

In addition to self-reported wellbeing measures, the Professional Quality of Life (ProQOL) Scale¹ questions are included in surveys, and compassion satisfaction and compassion fatigue scores calculated for each respondent. Compassion fatigue is reported as "Burnout" scores and "Secondary Traumatic Stress" scores, and these two scores can be used as dependent variables in measuring the impact of factors that, conceptually, are thought to contribute to either or both burnout or secondary traumatic stress.

Overall, respondents were satisfied (scale 4-7) with their current job, compensation, lifestyle, and the veterinary profession as a whole. However, about 30% of respondents were not satisfied with the profession (scale 1-3) (Figure 33).

FIGURE 33: RESPONDENT SATISFACTION*

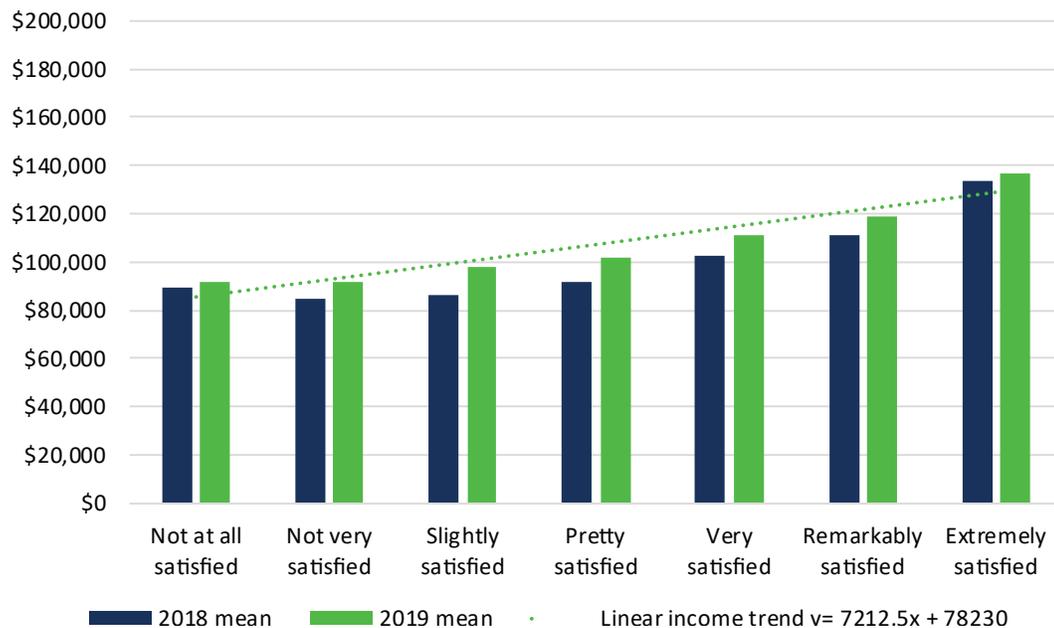


*1=not at all satisfied, 2=not very satisfied, 3=slightly satisfied, 4=pretty satisfied, 5=very satisfied, 6=remarkably satisfied, and 7=extremely satisfied.

The relationship that exists between level of satisfaction with employment and mean income is statistically significant. Of course, many factors contribute to satisfaction with employment, including actual hours worked compared to the number of hours desired, internal relationships, number of clients per day and level of debt. But there is a clear relationship between the level of income and satisfaction. On average, the mean income at each level of satisfaction is \$7,000 greater than the previous, lower level of satisfaction. The biggest difference exists between those who have reported being remarkably satisfied with their job and those reporting being extremely satisfied, with respective mean incomes of \$119,157 and \$136,719 (Figure 34).

¹B. Hudnall Stamm, 2009. Professional Quality of Life: Compassion Satisfaction and Fatigue Version 5 (ProQOL). /www.isu.edu/~bhstamm or www.proqol.org

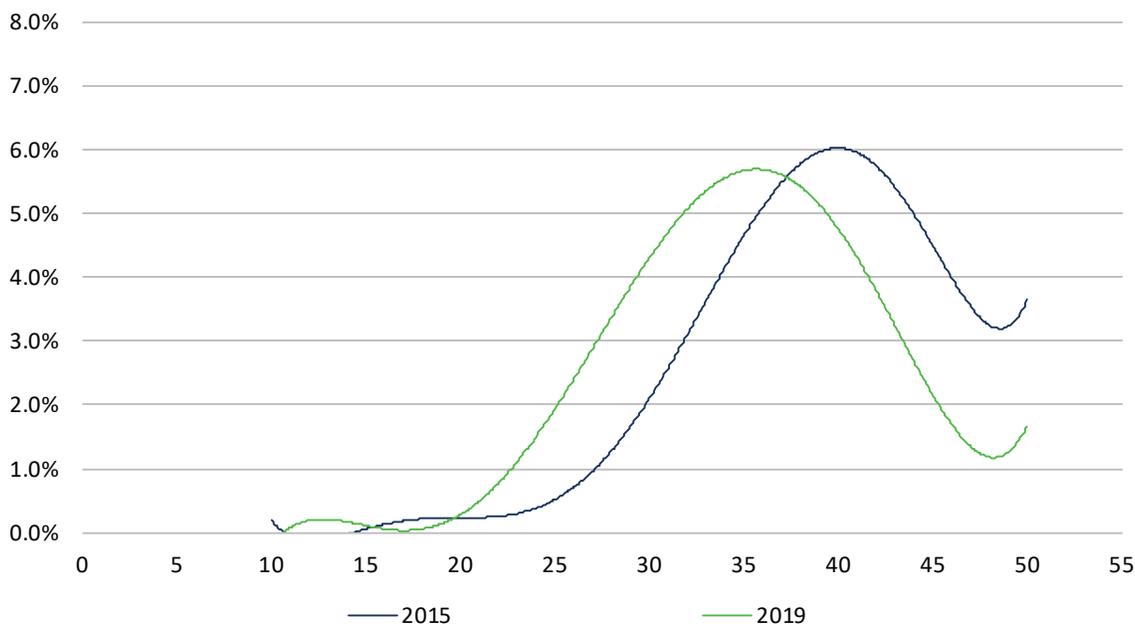
FIGURE 34: SATISFACTION WITH EMPLOYMENT BY MEAN INCOME



The profession is seeing high levels of burnout and secondary traumatic stress, even though there are veterinarians reporting high levels of compassion satisfaction.

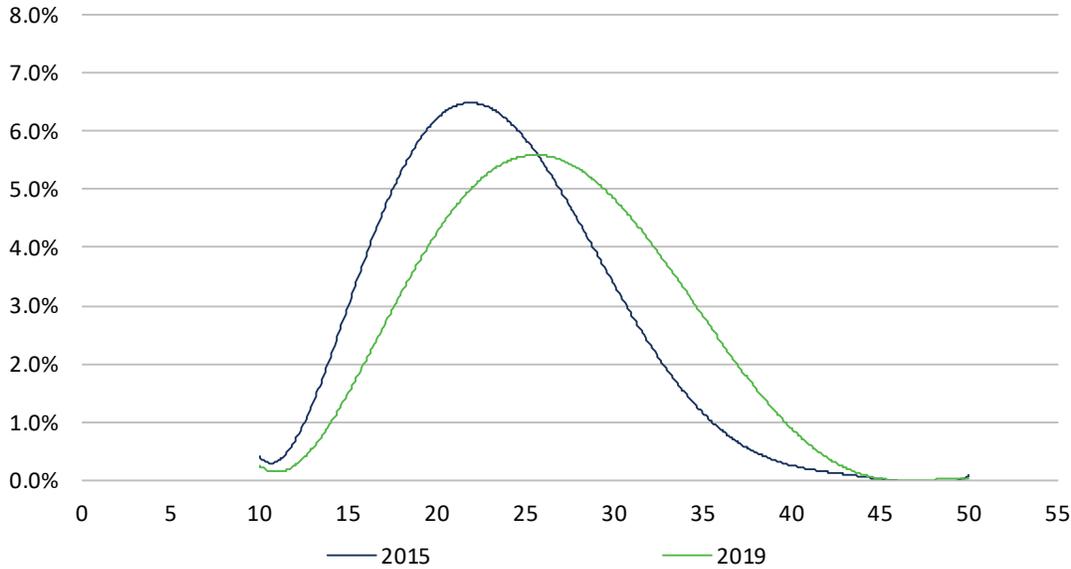
When looking at the charts for compassion satisfaction, burnout and secondary traumatic stress (from the ProQOL questions in the survey), the majority of respondents fall within the average across all other professions (scores between 23 and 42). The distribution of compassion satisfaction scores follows a normal distribution that is skewed left. A score of less than 22 is considered low for compassion satisfaction. The factors that continue to be associated with higher compassion satisfaction since 2015 are satisfaction with current employment, how well the respondent’s education has prepared them to be a veterinarian, and age. Veterinarians who are single continue to report lower compassion satisfaction than those who are married (Figure 35).

FIGURE 35: COMPASSION SATISFACTION SCALE



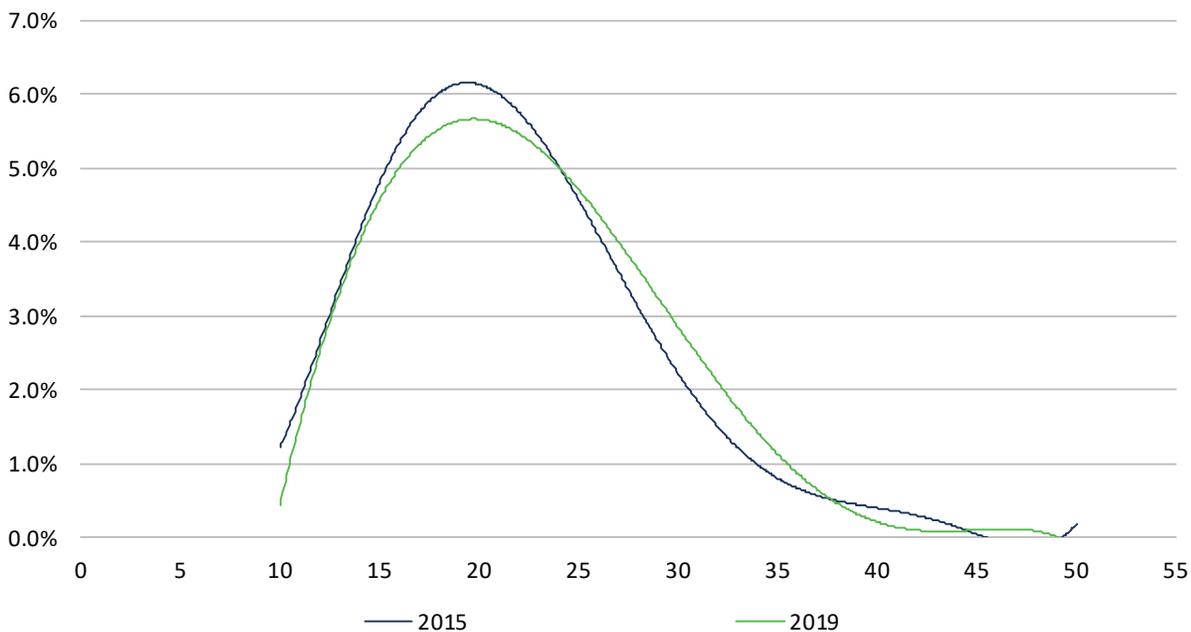
Two sources of compassion fatigue, burnout and secondary traumatic fatigue, were also measured. A score above 35 on the burnout or secondary trauma stress scale might suggest a need to seek help to deal with the factors that are causing either burnout, secondary trauma stress, or both. The burnout scores from the past and present surveys were normally distributed with the mean at the low end of the normal range. However, 12.0% of 2019 respondents had scores more than 35, the same as the previous year but still an increase from 2017 (9.8%) (Figure 36). When looking at burnout scores, dissatisfaction with current employment, feeling their education didn't prepare them well to be a veterinarian, and higher hours worked continue to be associated with higher burnout since 2015.

FIGURE 36: BURNOUT SCALE



Secondary traumatic stress scores had a similar distribution to that of the burnout scores. But the mean in 2019, and the percent of respondents with a score above 35 (4.9%, compared with 4.4% in 2018), was lower compared to the burnout scores. Following the same trend since 2015, dissatisfaction with current employment, being female, and carrying educational debt were associated with higher secondary traumatic stress scores (Figure 37).

FIGURE 37: SECONDARY TRAUMATIC STRESS



Looking at compassion satisfaction, burnout and secondary traumatic stress scores by type of position, practice owners have higher compassion satisfaction, lower burnout, and lower secondary traumatic stress scores than associates. Out of all five groups, associates have higher burnout and secondary traumatic stress scores (Table 6). However, scores were only statistically significant for associates and practice owners, and secondary traumatic stress score for relief employees against all other employees.

TABLE 6: SATISFACTION, BURNOUT, AND SECONDARY TRAUMATIC STRESS BY POSITION TYPE

Type of position	Compassion satisfaction score	Burnout score	Secondary traumatic stress score
Associate: employee	34.6*	27.4*	23.3*
Hospital director of a corporate practice	36.3-	26.7-	23.0-
Relief employee	34.6-	26.1-	21.2*
Consultant	37.5-	24.7-	19.8-
Practice owner	37.9*	24.9*	21.2*

* Scores that are statistically significant, meaning they are not attributed to chance

Summary

Demographics shifts continue to impact the veterinary profession, creating change and opportunities for the industry and practices. Wellbeing continues to be one of the most critical issues facing the profession, touching an entire community.

The veterinary profession showed strength and opportunities in 2019 with respect to income and employment. Incomes continue to increase from year to year. However, a gender-wage gap remains present, especially through practice ownership and mid-career, with a \$97,000 difference. Low unemployment means graduating veterinarians are finding work, but the employer’s side must have a competitive environment to attract candidates as many positions are going unfilled.

We also observe continued shifts with respect to hours desired and location preference. As the baby boomer generation retires and more millennials enter the workforce, we see a desire to work fewer hours across gender types. Year over year, we have observed a preference for urban and suburban jobs, possibly contributing to the likelihood of a job going unfilled and mobility between sectors.

While high compassion satisfaction continues to increase, burnout and secondary traumatic stress are increasing alongside satisfaction. Long work hours, student and educational debt, and overall lifestyle are some of the factors that are impacting veterinarians’ quality of life. It is seen that the majority of veterinarians are happy with their current job and compensation (as also seen by data showing that an increase in compensation increases satisfaction level), but their lifestyle and what they think of the profession continue to be concerns. The hardest hit by burnout and secondary traumatic stress are associates. Associates may be younger, have more debt, and are more likely to be single and have difficulty making ends meet.

With changes come opportunities. Increasingly high amounts of student loan debt elevate the need for incomes to continue increasing. Continued research and work are needed to identify and execute strategies to that will eliminate the gender pay gap. Employers can implement an array of benefits to attract candidates. With men and women seeking fewer hours, flexible scheduling, vacation, and paid sick leave policies can help attract candidates. Job seekers can benefit from research and data to find jobs that are going unfilled, leverage resources such as government assistance loans, use bargaining power, and negotiate a favorable offer.

Veterinarians are essential members of society, making the wellbeing of veterinarians an important issue for the profession and all of society. Some strategies to make wellbeing an integral part of the workplace, integrating work with lifestyle:

- Creating a healthy environment that allows employees to take regular breaks (inside and outside)
- Encouraging employees to talk about traumas or other difficulties
- Acknowledging good work and showing appreciation for employees
- Leading by example with a wellbeing initiative
- Decreasing work hours or creating flexible scheduling options
- Implementing open-door policies for managers
- Conducting regular check-ins with employees
- Allowing mental-health recharge days

These are just a few strategies to consider. Other options to improve wellbeing may include creating a path towards practice ownership for those who aren’t already an owner. Data shows this helps reduce burnout and secondary traumatic stress.

For more information on how to set up a workplace wellbeing program and resources to support veterinary wellbeing see avma.org/WorkplaceWellbeing and avma.org/Wellbeing.

THE MARKET FOR VETERINARY SERVICES

Animal healthcare services and the underlying process that leads to the production, access, and consumption of veterinary services fall into the market for veterinary services. Veterinarians ensure the production of animal health care services necessary to meet the demand of animal owners. The size of the veterinary workforce is a determinant of the quantity of services available. The structure of the market and the interactions between veterinarians and animal owners determine the quantity of healthcare services demanded and supplied.

Understanding the market for veterinary services requires a comprehensive workforce analysis. The workforce analysis focuses on three main objectives: estimate the demand and supply of veterinarians necessary to meet national and state needs; determine factors affecting demand and supply of veterinarians; and identify potential areas of veterinarian shortages. The structure of the market refers to degree of consolidation that is taking place in the veterinary services market and the level of competition among veterinary businesses. The behavior of the actors on the market summarizes how veterinarians and animal owners interact in selling and buying animal health care services.

To help veterinarians conceive strategies to meet new business challenges, economic trends need to be identified. The second part of this report section focuses exclusively on veterinary practices. Descriptive statistics on practice size, type, location, productivity measures, revenue, and expenses are reported. Changes to any of these measures over time provide insights on where the veterinary businesses are and where they are heading. This report section is essentially helpful for practice owners, practice managers, and decision makers.

The market for veterinary services reflects changing demographics and economics. Women continue to enter veterinary medicine in greater numbers, now comprising over 63% of DVMs, and millennials have overtaken baby boomers as they approach 35% of the workforce. Small practices focused on companion animals continue to be the dominant employer. Revenue streams for these small practices differ from their peers, with small practices highly dependent on wellness exams (up to 30% of revenue).

Methodology

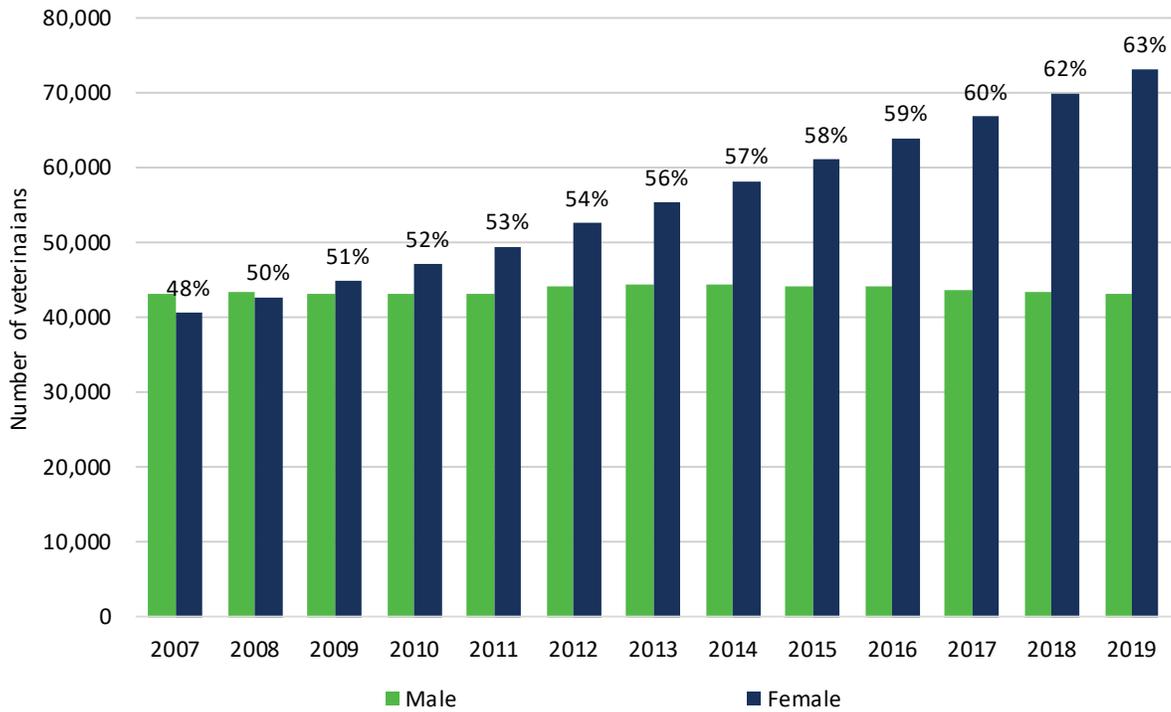
The workforce analysis uses data from the AVMA membership database, which includes information on both AVMA members and nonmember veterinarians for each year since 2007. Member information includes demographics and employment-related information. Because information for nonmembers may date to their years in veterinary college, data available for these individuals are mostly limited to demographics. Nevertheless, the AVMA data sets provide a better understanding and reveal useful insights about the U.S. veterinary workforce.

Reporting and analysis on practices and practice characteristics uses data from the AVMA Practice Owner Survey, an annual survey sent to a random sample of practice owners in the United States. The main objective of the survey is to collect data that can help measure changes in the structure of the veterinary industry in the United States. The 2019 Practice Owner Survey was sent electronically to a randomly selected sample of 22,600 U.S. practice owners. The response rate was approximately 11%, with relative consistency since 2015. Data were collected from 2,319 practices across the U.S. A large majority (89%) of these practices were private practices, 3% were private referral practices, and 4% were corporate owned practices, the remaining 4% were identified as other private practices. In terms of primary focus of the practice, companion animal exclusive practices were the leading group (57% of respondents). Practices also were categorized by type of business. Of all practices responding to the survey, hospitals represented 62%, both ambulatory and hospital 17%, mobile practices 9%, and ambulatory/emergency 1%, and 11% were missing this information. Half of the practices were from suburban areas, and the rest from either rural or urban communities.

The changing workforce

The U.S. veterinary workforce continues to grow. In 2019, the number of active veterinarians was estimated at 116,000, a 2.5% increase over 2018. Women represented more than 60% of the workforce (Figure 38). The annual growth rate between 2007 and 2019 was estimated at 2.8%, suggesting the number of active veterinarians is growing (Figure 38). This is not surprising, given demand for veterinarians continues to increase. Factors contributing to this increase include but are not limited to: high performance of the national economy in recent years, an increase in the pet population with a high expectation for pet health care services, and the increasing demand of the livestock industry.

FIGURE 38: VETERINARY WORKFORCE AND GENDER DISTRIBUTION

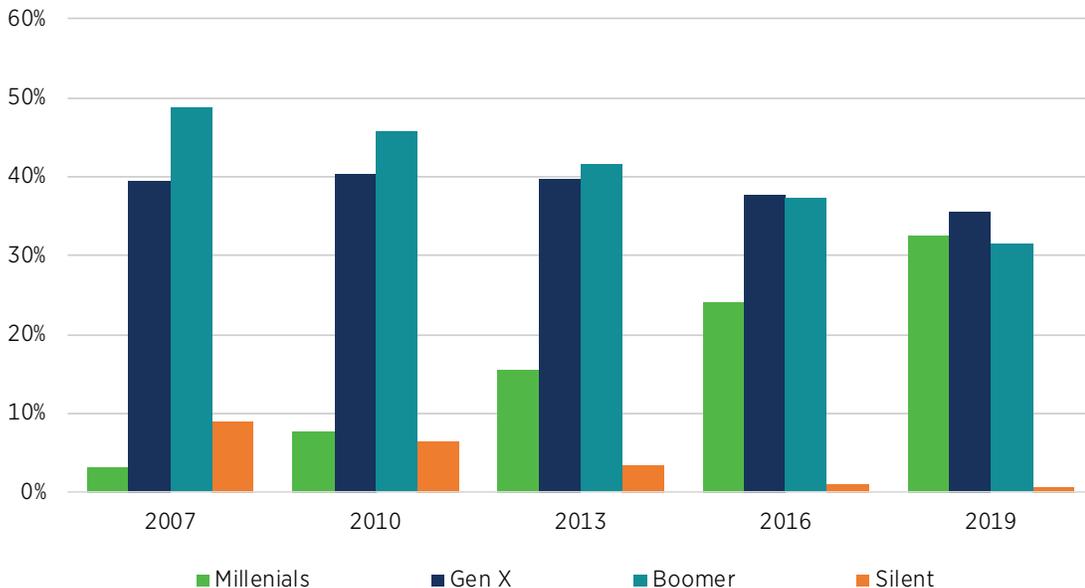


U.S. veterinary workforce contains active members across four major generational cohorts: the silent generation (born 1925-1945), baby boomers (born 1946-1964), Generation X (born 1965-1979), and millennials (born 1980-1994). The oldest members of Generation Z (born 1995-2012) are showing up in the veterinary workforce, but their share is still very small compared with the other groups (Figure 39).



By 2030, the youngest baby boomers will have reached the official age of retirement

Since 2016, millennials have overtaken Generation X to become the leading group in the U.S. veterinary workforce. In 2019, the share of millennials in the workforce reached 35%, followed by the Generation X (32.6%) and baby boomers (31.8%).



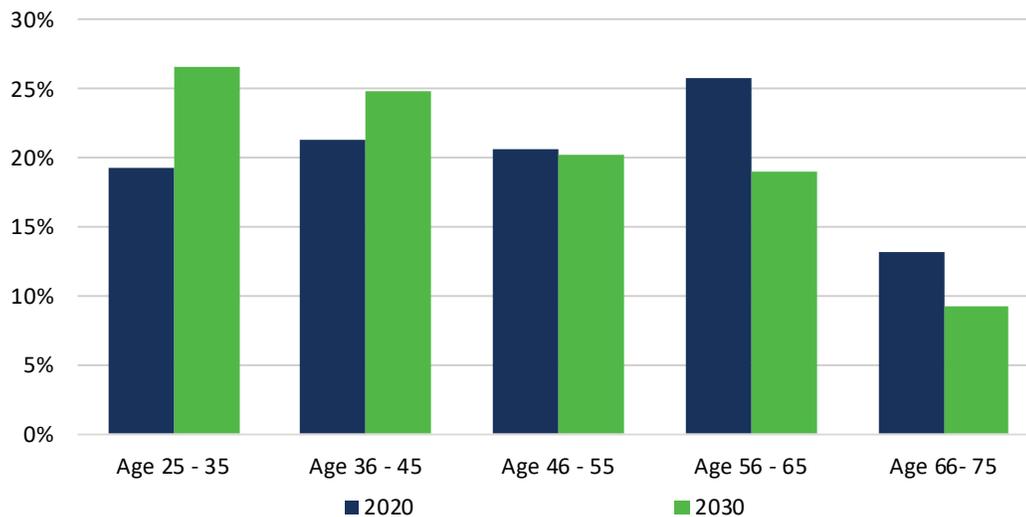
By 2030, the youngest baby boomers (those born in the late 1950s and early 1960s) will have reached the official retirement age of 65. Although new veterinarians will be trained to replace them as they retire, the veterinary profession may face a profound shift in mindset and culture as about 18,000 of its experienced workers retire over a period of many years (assuming 50% of the 36,500 boomers currently active in the veterinary workforce retire).

This necessary generational shift likely will come with significant changes to the profession, as each generation has its own cultural tendencies and characteristics that make it different from the others. While this shift may present some challenges resulting from generational differences in work ethics, values, and commitments, practice owners and employers also can leverage these differences into business and market opportunities.

After graduation, new veterinarians can choose among many career options. Those who chose private practice provide animal health care services to food and farm animals and a rising population of companion animals. To ensure the continuity of animal health care services, each veterinary segment should have a decent rate of replacement. In other words, the age distribution of workers should show as many young folks as older workers within a segment, so there are enough younger workers to replace older ones as they retire.

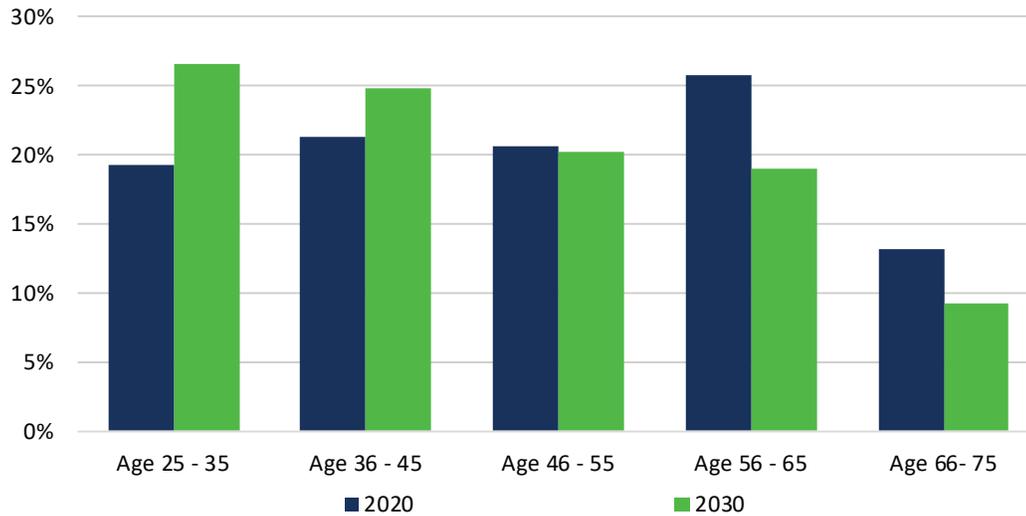
Figure 40 shows the age distribution of companion animal veterinarians in 2020 and the forecast for 2030. Companion animal veterinarians are young in general (more than 50% were 45 years or below in 2020), and in 2030 the share of veterinarians 45 years or below will remain above 50%. The shape of this distribution suggests that unless there is an unexpectedly higher demand for veterinarians (demand increased above what the industry has historically experienced), there will not be a shortage in the next 10 years.

FIGURE 40: AGE DISTRIBUTION OF COMPANION ANIMAL VETERINARIANS



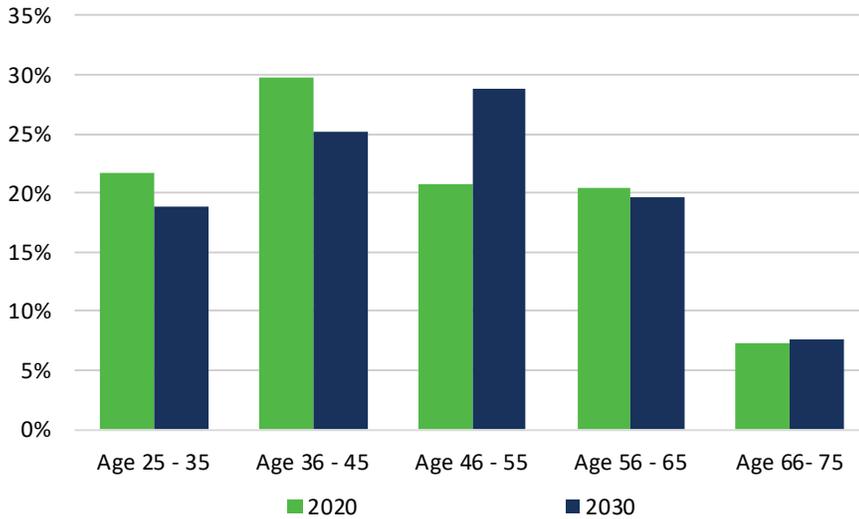
The age distribution of food animal veterinarians currently exhibits a left-skewed distribution, suggesting more older veterinarians than younger ones. In 2020, the share of food animal veterinarians over 46 years of age is estimated at nearly 60% of the population (Figure 41). AVMA’s projection shows that the share of the veterinarians over 46 will gradually decline while that of veterinarians 45 years or below will increase, reaching 51% by 2030. With this possibility of a massive exit of veterinarians, the risk of veterinarian shortage is relatively high.

FIGURE 41: AGE DISTRIBUTION OF FOOD ANIMAL VETERINARIANS



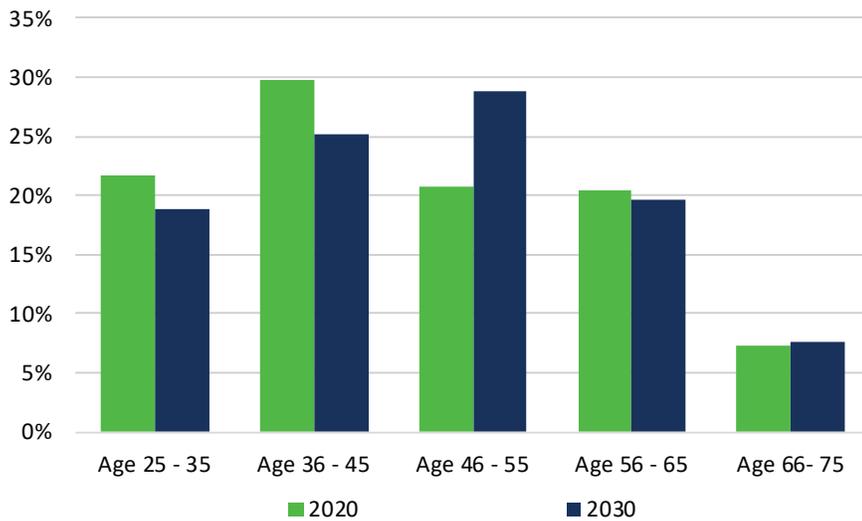
Mixed animal veterinarians show similar trends to food animal veterinarians. Currently, the population of mixed animal veterinarians under 46 is estimated around 40% by 2030, with mixed animal veterinarians under 46 years reaching 52% (Figure 42).

FIGURE 42: AGE DISTRIBUTION OF MIXED ANIMAL VETERINARIANS



In the opposite of the three other segments, the age distribution of equine veterinarians (Figure 43) over 45 years of age is expected to increase from 48.6% in 2020 to 56.1% by 2030. It's important to closely examine this segment, monitor the shape of the distribution, and determine the causes that drive new veterinarians away from this segment. Sustainable solutions are needed to avoid shortages in the future. Although the risk of shortage is small, it is important to act before it happens. A recent survey by the AVMA and the American Association of Equine Practitioners (AAEP) on equine practitioners showed that many leave equine medicine after five years. Some of the reasons for leaving the field included perceived difficult lifestyle, high work hours, emergency and call duty requirements, mental health and stress, low salaries and compensation, and unfavorable work culture. Creating solutions to these challenges may help address the potential looming shortage.

FIGURE 43: AGE DISTRIBUTION OF EQUINE VETERINARIANS



Companion animal veterinarians represent the largest segment in the U.S. veterinary profession. The number of companion animal veterinarians in the U.S. was estimated at 73,862 in 2018 and is expected to reach 81,942 by 2024, and 88,451 by 2030 (Table 7). Food animal veterinarians were around 5,800 in 2012 and are expected to reach 6,000 by 2030. Mixed animal and equine veterinarians will remain around 5,000 for the next decade. Among the public sectors, academia is the leading group, with 7,960 veterinarians working in colleges and universities in 2018, anticipated to be 8,000 by 2030. Uniformed service veterinarians remain the smallest group at approximately 650 veterinarians, with an estimated decline from 662 in 2012 to 573 by 2030.

TABLE 7: VETERINARIANS BY TYPE OF EMPLOYMENT

	2012	2018	2024	2030
Companion animal	63,918	73,862	81,942	88,451
Food animal	5,841	5,746	5,781	6,018
Mixed animal	4,230	4,173	4,449	4,710
Equine	4,259	4,852	4,932	5,006
Federal civil service	1,977	1,981	1,880	1,779
State and local government	1,354	1,345	1,317	1,306
Uniformed service	662	662	636	573
College/University	7,133	7,960	7,998	8,123
Industry/Corporate	2,857	3,117	3,543	3,739
Nonprofit	1,018	1,353	1,709	2,026
Other public practice	1,913	1,985	2,011	1,926

Source: AVMA membership data

We estimate that in 2018, about 36,000 FTEs were required to meet the demand for dog health care services in the U.S. Increases in dog population and subsequent pet health care services is anticipated to result in 38,436 veterinarians FTEs who care for dogs by 2024, and 41,443 by 2030 (Table 8).

For cat health care providers, we project demand for 23,353 FTEs by 2024 and 25,290 FTEs by 2030. In total, about 63,712 DVM FTEs will be needed to meet the national demand for pet health care by 2024 and around 68,700 DVM FTEs by 2030.

For food animal veterinarians, our estimates show that in 2018, approximately 6,795 FTEs were required to meet the national demand. Our forecast suggests that by 2024, 6,800 FTEs will be necessary to meet the demand for food animal health care services, rising to about 7,000 FTEs by 2030. For horse health care, 5,415 DVM FTEs were estimated in 2018 with a forecast of 4,500 FTEs needed by 2030 to cover the domestic demand.

For public sectors, the total number of DVM FTEs expected to meet national demand by 2030 is estimated at 16,382. This represents a 17% increase over estimated demand in 2012.

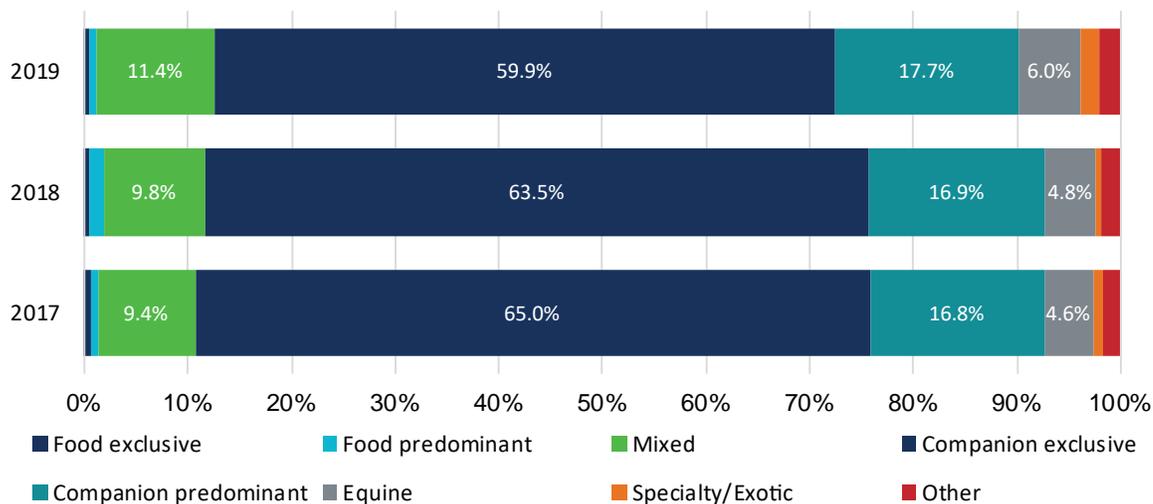
TABLE 8: NUMBER OF VETERINARIAN FTEs NEEDED BY PRACTICE TYPE

	2012	2018	2024	2030
Dogs	29,765	36,380	38,436	41,443
Cats	17,597	20,741	23,353	25,290
Birds	436	595	537	443
Other pets	768	1,344	1,386	1,455
Dairy cattle	3,320	2,522	2,499	2,584
Beef cattle	2,539	2,360	2,309	2,341
Swine	884	780	840	892
Sheep and goats	707	746	745	744
Horses	6,098	5,415	5,323	5,361
Broilers, layers, and turkeys	111	188	198	216
Other livestock	282	199	209	220
Public practice	14,043	15,417	15,931	16,382
Total	76,549	86,687	91,766	97,371

Practice characteristics

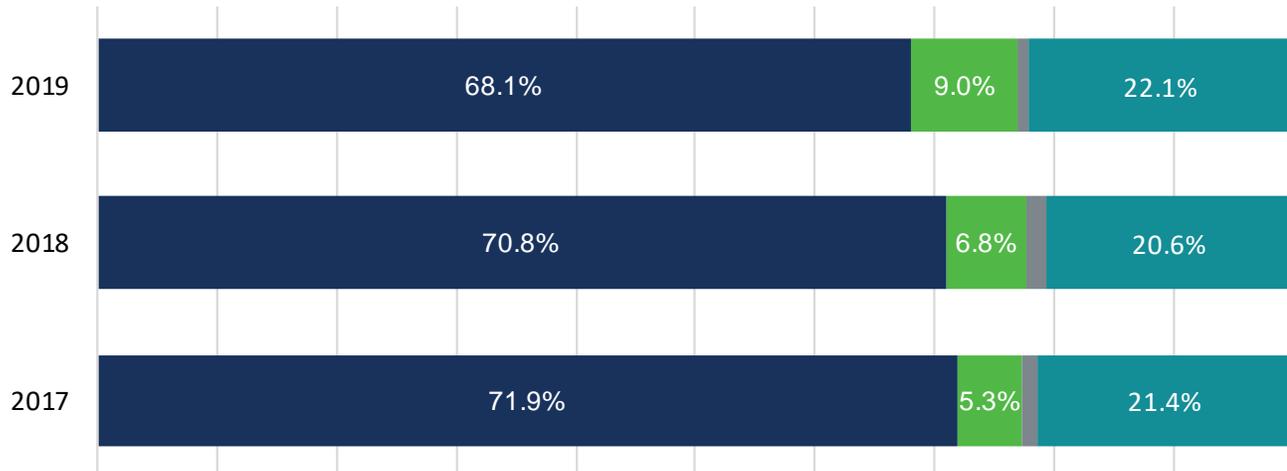
Using data from the AVMA practice owner survey, we observe several characteristics of veterinary practices. For three consecutive years, the share of companion animal exclusive practices among U.S. veterinary practices has been around 60% (Figure 44). The second largest group in 2019 was companion animal predominant practices (17.7%), followed by mixed animal practices (11.4%), with equine practices (6%) in fourth position. Food animal practices and specialty animal practices represent less than 3% of practices in the U.S.

FIGURE 44: U.S. VETERINARY PRACTICES BY PRIMARY FOCUS



The analysis also reveals that in 2019, most U.S. veterinary practices (68%) were classified as hospitals (Figure 45). Approximately 22% were classified as both ambulatory and hospitals, and 9% fell into the category of mobile practices. The smallest group was ambulatory/emergency, representing nearly 1%.

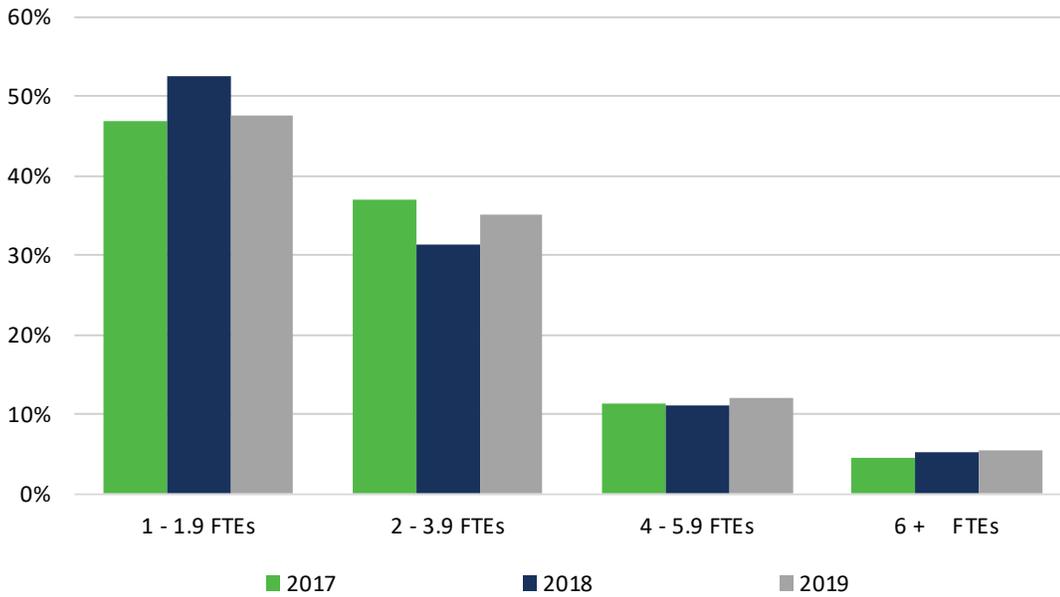
FIGURE 46: U.S. VETERINARY PRACTICES BY COMMUNITY TYPE



Staff utilization

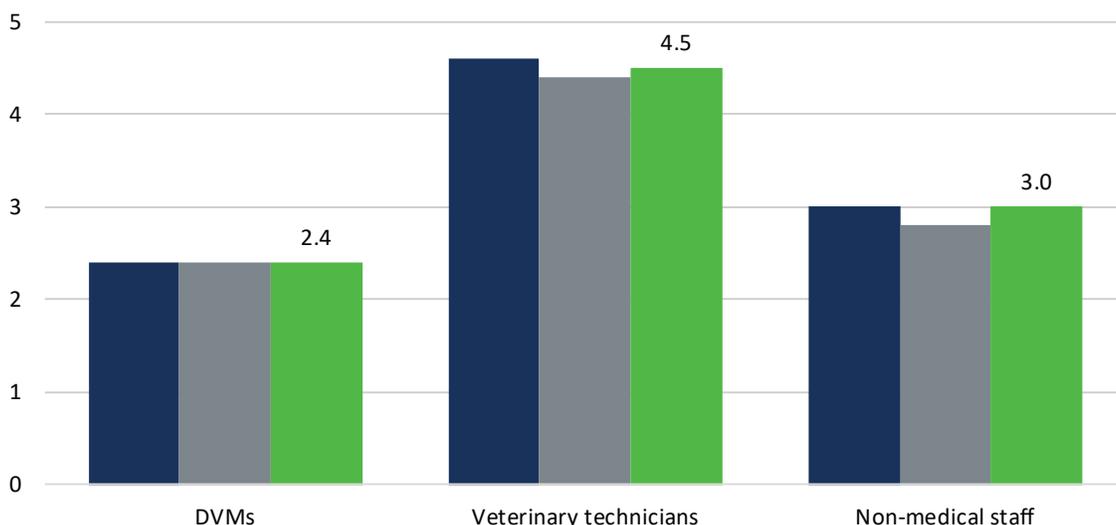
In 2019, 47.5% of practices had between 1 and 1.9 DVM FTEs (Figure 47), and 35% had between 2 and 3.9 DVM FTEs, representing a combined 80% of all practices. Approximately 18% of the practices reported 4 DVM FTEs or more.

FIGURE 47: VETERINARY PRACTICES BY STAFFING SIZE



A typical practice had on average 2.4 DVM FTEs, 4.5 veterinary technician FTEs, and 3 non-medical staff (Figure 48). The number of DVM FTEs per practice has remained consistent for three consecutive years. The number of veterinary technicians increased from 4.4 FTEs in 2018 to 4.5 FTEs in 2019. Non-medical staff also increased, from 2.8 FTEs per practice on average in 2018 to 3 FTEs in 2019.

FIGURE 48: AVERAGE NUMBER OF STAFF PER PRACTICE



The mean number of DVM FTEs increased from 2.2 in 2014 to 2.4 in 2015 and has remained unchanged since then (Table 9). There is no substantial variation in mean number of FTEs across types of practices except for food animal predominant practices, which went from about 2 FTEs in the previous years to 4.2 in 2019. This is most likely due to an error in reporting numbers. Other than food predominant practices showing an outlier in the mean number of DVM FTEs, the remainder of practices reported a mean number that ranges from 1.6 FTEs (food exclusive practices) to 2.9 FTEs (exotic/specialty animal practices). For the last two years, the mean number of DVM FTEs for companion animal practices seems to be declining. With the exception of companion animal practices, all other practices have witnessed an increasing trend in DVM FTEs employed in practices.

TABLE 9: AVERAGE DVM FTES BY PRIMARY FOCUS OF PRACTICE

	2014	2015	2017	2018	2019
Food excl.	1.9	2.2	1.3	1.5	1.9
Food pred.	2.5	2.9	2.2	2.6	4.2
Mixed	2.5	3.0	2.7	2.4	2.6
Companion excl.	2.3	2.4	2.5	2.5	2.4
Companion pred.	2.1	2.1	2.2	2.4	2.3
Equine	2.0	2.0	1.9	1.9	2.3
Exotic/Specialty	2.5	1.9	2.0	2.6	2.9
All practices	2.2	2.4	2.4	2.4	2.4

The mean number of veterinary technician FTEs increased from 3.9 in 2014 to 4.6 in 2017, declining to 4.5 FTEs in 2019 (Table 10). The mean number of veterinary technicians varies drastically with respect to the primary focus of the practice. In 2019, for instance, food animal exclusive practices reported a mean number of technicians below 1 FTE while companion animal exclusive reported on average 5.1 FTEs. Food exclusive practices did not show a clear pattern in veterinary technician FTEs over the five-year period, but food predominant practice veterinary technicians seem to increase during high economic performances and decline during slow growth.

TABLE 10: AVERAGE VETERINARY TECHNICIAN FTES BY PRIMARY FOCUS OF PRACTICE

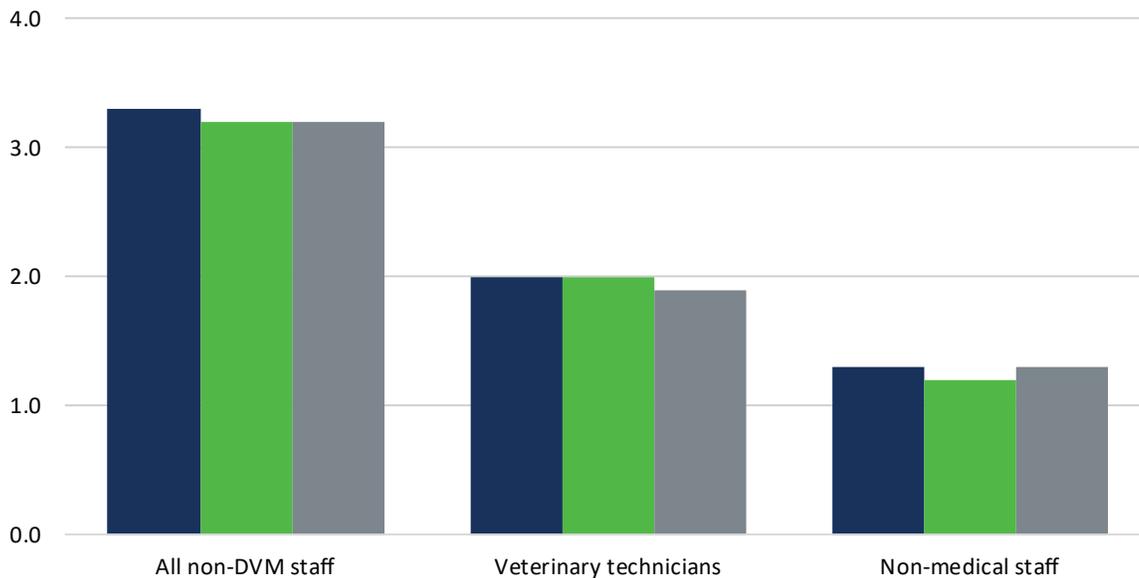
	2014	2015	2017	2018	2019
Food excl.	0.7	1.1	0.0	1.8	0.5
Food pred.	1.5	1.8	0.6	2.1	4.0
Mixed	3.1	3.8	3.6	3.4	3.2
Companion excl.	4.3	4.8	5.2	4.8	5.1
Companion pred.	3.7	4.1	4.3	4.5	4.3
Equine	1.6	1.3	1.2	1.6	2.1
Exotic/Specialty	4.0	4.9	4.4	6.2	4.3
All practices	3.9	4.4	4.6	4.4	4.5

The mean number of non-medical staff FTEs per practices in 2019 was 3, with an up-and-down trend for the last several years (Table 11). In 2019, companion animal practices had the highest number of non-medical staff (3.4 mean FTEs). Food animal predominant practices reported on average 3 FTEs per practice. For exotic/specialty practices and equine practices, the mean non-medical staff FTEs was 2.4 and 1.3, respectively.

TABLE 11: AVERAGE NON-MEDICAL STAFF FTES BY PRIMARY FOCUS OF PRACTICE

	2014	2015	2017	2018	2019
Food excl.	1.2	1.2	0.1	1.1	0.3
Food pred.	1.6	2.0	1.4	1.0	3.0
Mixed	2.7	3.0	2.6	2.3	2.3
Companion excl.	3.2	3.8	3.4	3.1	3.4
Companion pred.	3.1	3.2	2.7	2.7	3.4
Equine	1.2	1.3	0.8	1.1	1.3
Exotic/Specialty	2.3	1.7	2.6	4.4	2.4
All practices	3.0	3.4	3.0	2.8	3.0

Looking at the ratio of DVM to other staff, the typical veterinary practice in the U.S. has a ratio of 1 DVM FTE for 3.2 non-DVM staff (Figure 49). The mean has declined slightly from 3.3 FTEs in 2017. In addition, the ratio of DVMs to veterinary technicians went from 1:2 in 2018 to 1:1.9 in 2019. In 2019, the ratio of DVM to non-medical staff was 1:1.3.

FIGURE 49: DVM TO STAFF RATIO

The ratio of DVM to non-DVM staff is trending up for companion animal exclusive practices and declining for the other practice types (Table 12). For mixed animal practices, the ratio declined from 1:2.5 in 2018 to 1:2.4 in 2019. Equine practices went from 1:1.4 in 2018 to 1:1.1 in 2019. Exotic/specialty animal practices saw similar declines at 1:3.4 in 2018 to 1:2.6 in 2019.

TABLE 12: MEAN NON-DVM STAFF PER FTE

	2014	2015	2017	2018	2019
Food excl.	1.2	0.9	0.1	0.7	0.4
Food pred.	1.0	1.2	0.9	0.9	1.3
Mixed	2.4	2.4	2.5	2.5	2.4
Companion excl.	3.3	3.6	3.6	3.5	3.7
Companion pred.	3.1	3.4	3.5	3.5	3.4
Equine	1.2	1.1	1.0	1.4	1.1
Exotic/Specialty	2.9	3.5	3.6	3.4	2.6
All practices	3.1	3.3	3.3	3.2	3.2

TABLE 13: MEAN VETERINARY TECHNICIANS FOR EACH DVM FTE

	2014	2015	2017	2018	2019
Food excl.	0.5	0.5	0.0	0.4	0.4
Food pred.	0.4	0.5	0.2	0.5	0.9
Mixed	1.3	1.3	1.4	1.5	1.4
Companion excl.	1.9	2.1	2.2	2.1	2.2
Companion pred.	1.7	1.9	2.2	2.2	1.9
Equine	0.8	0.6	0.7	0.8	0.7
Exotic/Specialty	1.8	2.6	2.3	2.0	1.5
All practices	1.8	1.9	2.0	2.0	1.9

The ratio of DVM to non-medical staff declined slightly from 1:1.3 in 2017 to 1:1.2 in 2018, then increased to 1:1.3 in 2019 (Table 14). In general, there is approximately 1 non-medical staff FTE for each DVM FTE, except for food animal practices and equine practices.

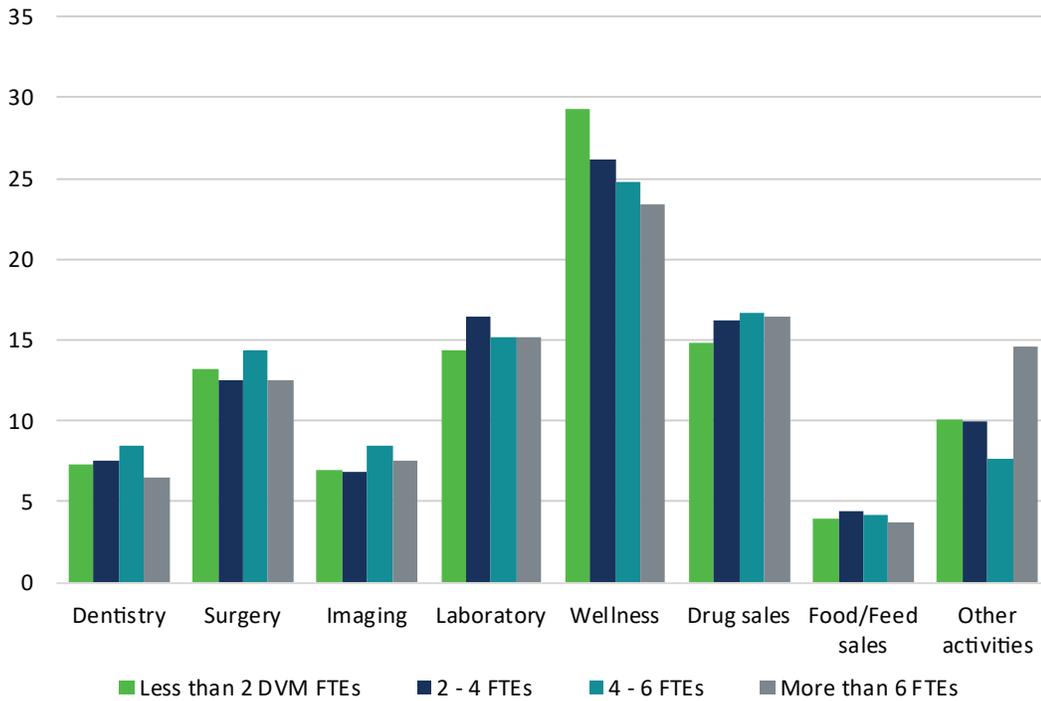
TABLE 14: MEAN NUMBER OF NON-MEDICAL STAFF FOR EACH DVM FTE

	2014	2015	2017	2018	2019
Food excl.	0.7	0.4	0.1	0.2	0.1
Food pred.	0.6	0.7	0.8	0.4	0.4
Mixed	1.1	1.0	1.1	1.0	1.0
Companion excl.	1.4	1.5	1.4	1.3	1.5
Companion pred.	1.4	1.5	1.3	1.3	1.5
Equine	0.4	0.5	0.3	0.6	0.4
Exotic/Specialty	1.1	0.9	1.2	1.4	1.0
All practices	1.3	1.4	1.3	1.2	1.3

Practice revenue

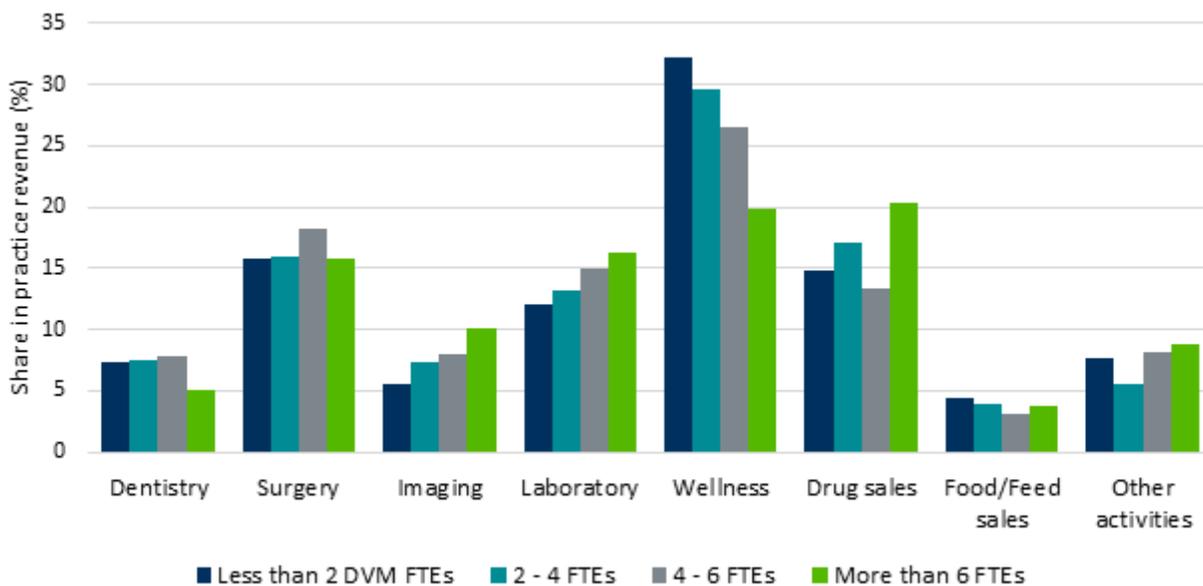
For companion exclusive practices, wellness exams are clearly the largest contributor of practice revenue, ranging from 23% to 29% and decreasing as size of practice increases (Figure 50). Drug sales range from 15% to 17% of revenue, laboratories are at 14% to 16% revenue, and surgeries between 12% and 14%, for small to large practices respectively. Dentistry, imaging, and food and feed sales account for less than 10% of practice revenue. It's important to recognize the share of other activities such as grooming, boarding and acupuncture, which represent over 10% of revenue for practices with at least 2 DVM FTEs and up to 15% of revenue for practices with 6 FTEs or more.

FIGURE 50: REVENUE COMPONENTS FOR COMPANION ANIMAL EXCLUSIVE PRACTICES



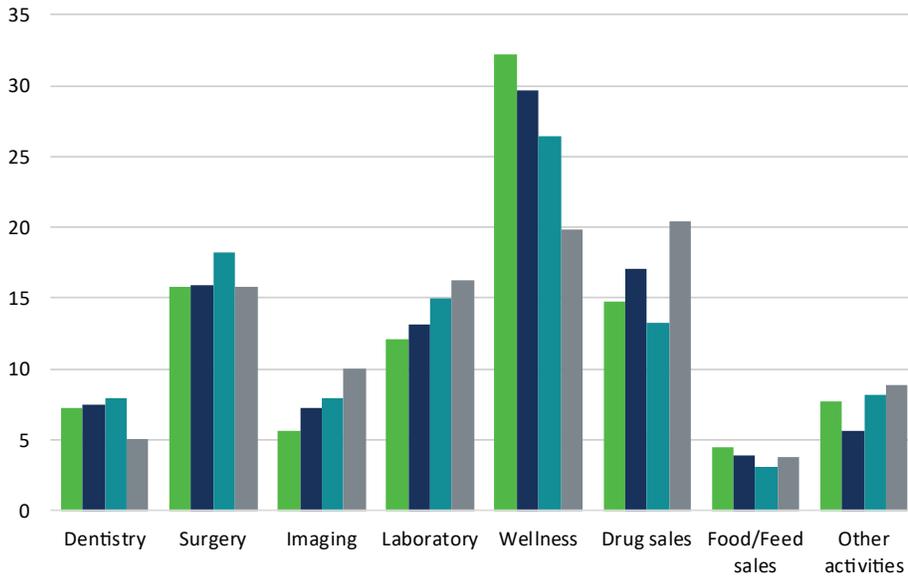
Companion predominant practices exhibit similar patterns as companion exclusive practices, with wellness/exams having the largest share of revenue and having a downward trend as practice size increases (Figure 51). Wellness/exams revenue range from 32.2% (less than 2 DVM FTEs) to below 20% (6 FTEs or more). For companion predominant practices, surgery, laboratory, and drug sales are among the largest contributors to practice revenue, with laboratory and drug sales increasing with the size of the practice. Imaging represents 5.6% to 10% of revenue, dentistry slightly over 5%, while food and feed sales represent less than 5% of companion predominant practice revenues.

FIGURE 51: REVENUE COMPONENTS FOR COMPANION ANIMAL PREDOMINANT PRACTICES



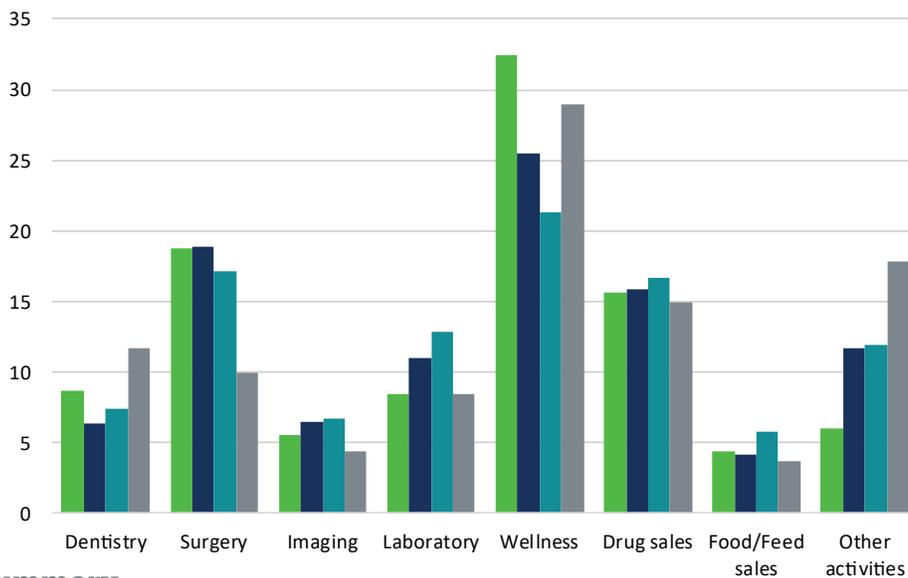
For mixed animal practices, wellness/exams holds the largest share of revenue at 21% to 32% depending on the size of the practice (Figure 52). Surgery emerged as the second largest contributor ranging from 10% to 19%, followed by drug sales, laboratory, and dentistry.

FIGURE 52: REVENUE COMPONENTS FOR MIXED ANIMAL PRACTICES



Wellness/exams held the largest share for all practices regardless of the size. For equine practices, wellness/exams and imaging are among the largest contributors of the revenue among practices with 4 to 6 DVM FTEs (Figure 53).

FIGURE 53: REVENUE COMPONENTS FOR EQUINE PRACTICES



Summary

As demographics continue to shift, practices will need to consider what strategies they can implement to help attract women and millennials. Millennials are now the leading generation in the veterinary workforce. With most of the baby boomers retiring in the next several years, the veterinary profession will undergo a significant generational shift. As of July 2019, millennials represent the largest generation in the U.S. population according to Pew Research. They also represent a large share of the pet product consumers and the largest segment of consumers in general. These changes, although challenging, bring opportunities for practice owners. There are opportunities to change workplace culture and habits, enabling better communication between employees and clients.

The market structure is also undergoing structural changes with consolidation. New types of competitors such as online retailers, e-pharmacies and mergers of all types are stepping into the market. It's important that practice owners adapt marketing strategies that showcase leadership in their community. Mass communication and social media are powerful channels that can target and reach the vast majority of pet product and animal healthcare users. Practice owners should also explore strategies such as local marketing and branding to attract and retain clients. It's also possible to adopt strategies that are unique at least within the local market. Owners can innovate by doing what no competitors are doing. All practices, small and large, can leverage these strategies to improve practice efficiencies and keep track of the factors that impact overall productivity .

COVID-19

Coronavirus Disease 2019 (COVID-19) was first detected in China in late 2019 and has since spread across the globe, including throughout the United States. The World Health Organization characterized COVID-19 as a pandemic on March 11, 2019. Every state in the U.S. has been impacted by COVID-19, with each state deciding if, when, and how to implement mandatory closures.



On March 11th, the World Health Organization characterized COVID-19 as a pandemic

The impact of COVID-19 on the veterinary profession was sudden, far-reaching, and varied. Across the country, veterinary practices made tremendous changes to ensure patients would continue to receive essential veterinary care while also implementing new safety measures to protect team members and clients. This section reports the impact of COVID-19 on practices, how practices are responding, and strategies for COVID-19.

Methodology

The AVMA conducted a large survey of practice owners in April 2020 to better understand how COVID-19 had affected veterinary practices. We collected over 2,000 responses representing different practice sizes, types, and species. Questions covered operational changes, client numbers, use of personal protective equipment (PPE) and other supplies, financial impact, and other topics. The first wave of responses was recorded in April 2020 and are summarized in this report.

The results enable us to view a full picture of how COVID-19 impacted the profession and forecast how the economic situation will evolve as the pandemic continues to unfold. They also offer deeper insight into the ways individual practices were impacted – financially, operationally, and otherwise. This knowledge advances the profession on numerous levels including: identification of successful strategies; economic forecasts to plan and prepare for what is ahead; support for policy development and advocacy on behalf of veterinarians and practices; creation of tools and resources needed to support the profession; state-level analysis to better understand impacts; and empowering the veterinary community to better plan, strategize, and succeed during COVID-19 and beyond.

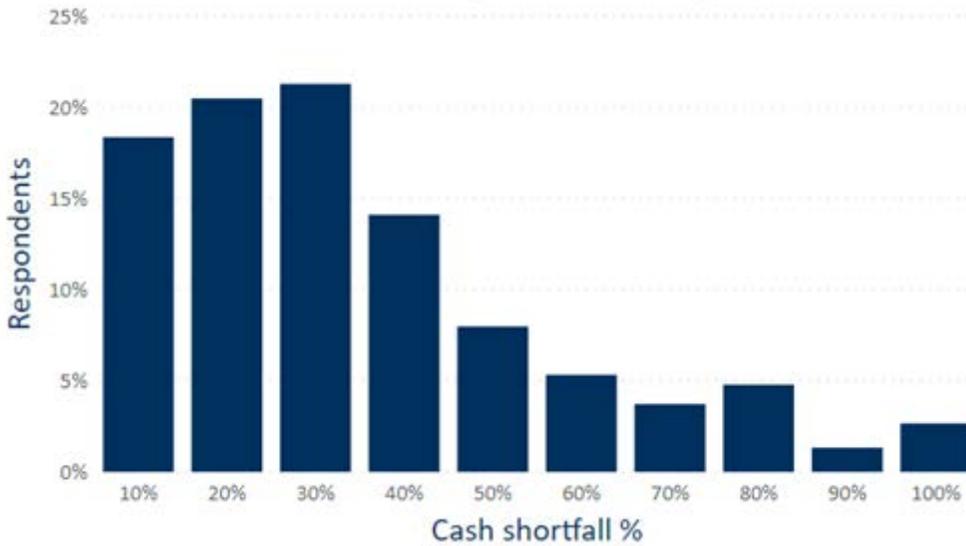


Average cash shortfall in April was \$17,000 and was projected to be \$23,000 in May

The impact of COVID-19

Nearly every practice reported a decline in revenue accompanied by a shortfall in cash/income necessary to accommodate practice operation. The majority of practices – about 65% – estimated their cash shortfall to be less than 30% of average monthly revenue (Figure 54). Although some practices reported 100% revenue loss for April, fewer than 5% of practices lost 90% or more of their average revenue. Most respondents anticipated larger cash shortfalls for the month of May, with increases in the 50% and higher categories. The average monthly cash shortfall across practices was \$17,000 in April and was projected to increase to \$23,000 in May. New Jersey and California were some of the hardest hit areas at the time of the survey, both having experienced early and significant outbreaks of COVID-19.

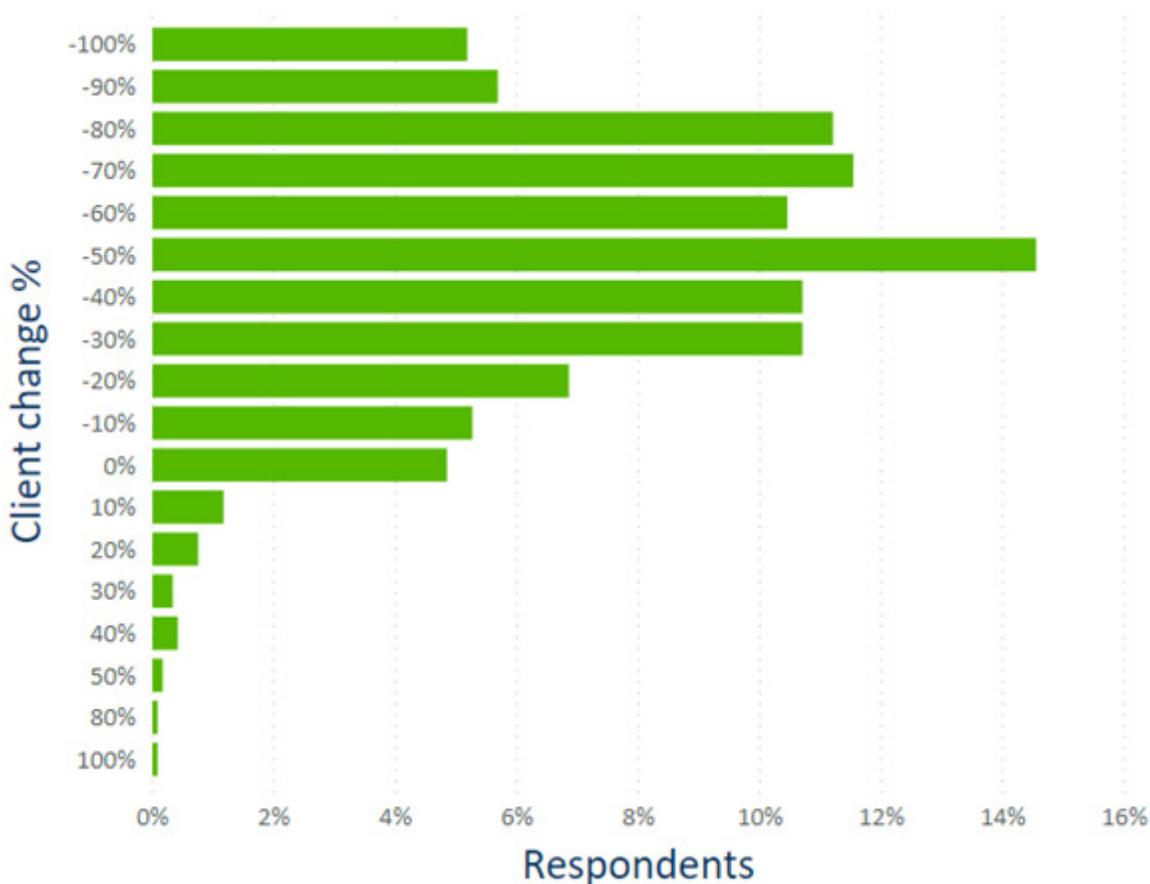
FIGURE 54: CASH SHORTFALL % FOR APRIL



Over half of all responding veterinary practices had seen client visits drop by 50% or more (Figure 55) at the time of the survey. Only about 5% of practices had stopped seeing clients completely. This decrease was also observed for new client traffic, with over half of practices seeing a decrease of 50-100%.

In addition to changes in client traffic and cashflow, practices began experiencing supply shortages. Over 80% of practices reported experiencing shortages of PPE and sanitation equipment, and over 50% of respondents reported they were unable to reorder PPE and/or sanitation equipment.

FIGURE 55: CLIENT CHANGE SINCE COVID-19



Responding to COVID-19

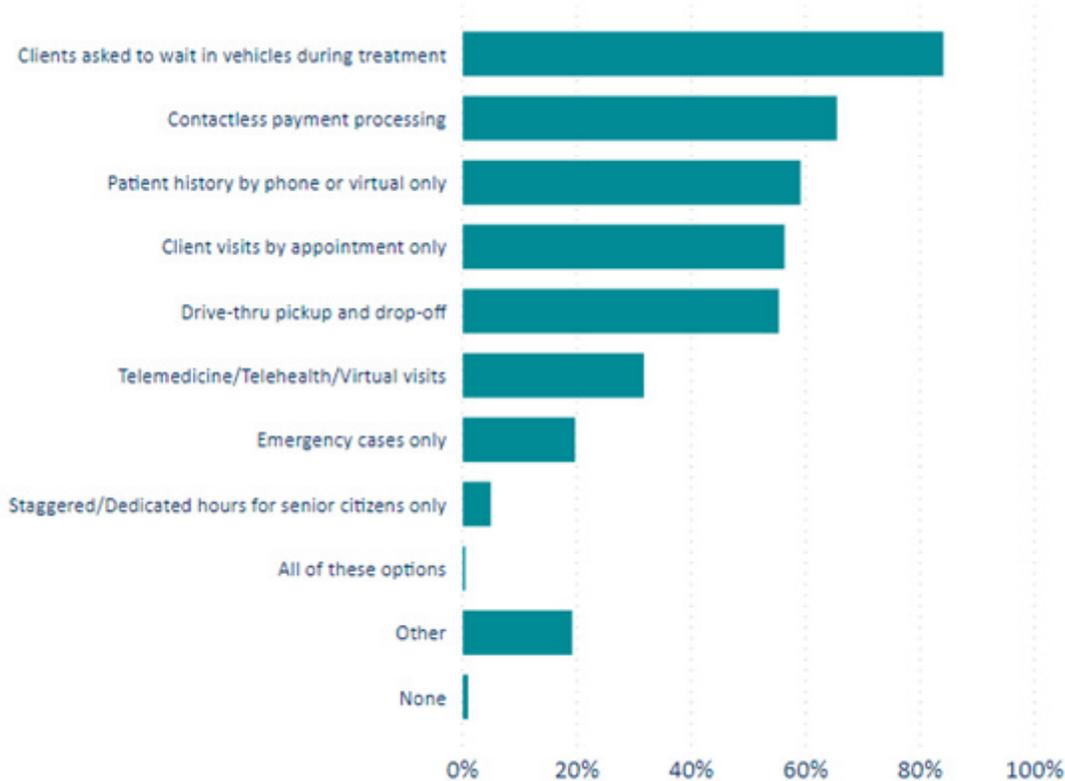
Practices quickly implemented a wide range of operational strategies and precautionary measures to continue providing veterinary care while limiting spread of the novel coronavirus and prioritizing the safety of team members and clients.



Over 98% of practices began limiting client contact

On the operational side, the most common approach was asking clients to wait in vehicles during animal exam and treatment (curbside care). Other operational changes (Figure 56) included contactless payment processing, taking patient history by phone or virtually, and implementing drive-thru pick-up and drop-off. Over 30% of veterinary practices reported they were using telemedicine, and close to 20% of practices were only seeing emergency-related cases at the time of the survey.

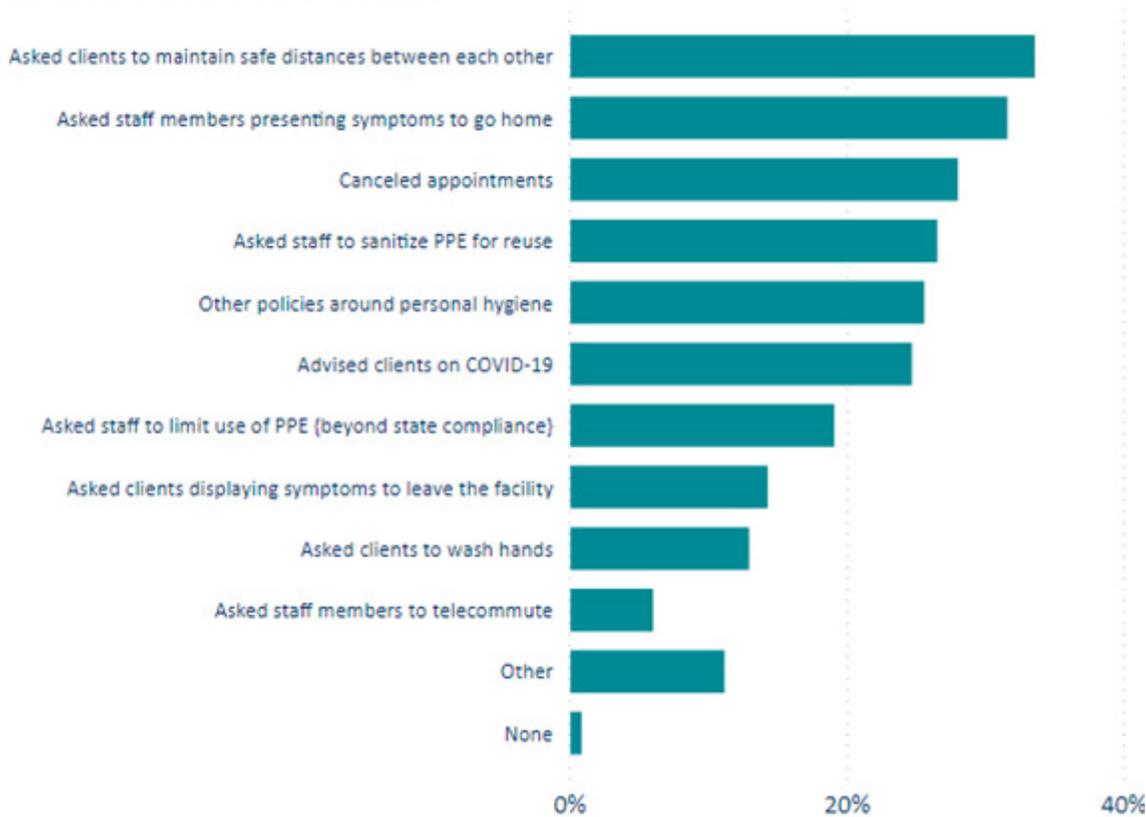
FIGURE 56: OPERATIONAL STRATEGIES



Precautionary measures (Figure 57) included asking clients to maintain social distancing, asking team members with symptoms of illness to remain at home, and canceling at least some appointments. Over 25% of practices said they had asked staff to sanitize and reuse PPE, while 20% had asked staff to limit the use of PPE beyond state requirements wherever possible to mitigate shortages.

In response to fewer clients, many practices began decreasing hours, reducing staff, canceling activities and reallocating expenses. Approximately 50% of practices reduced hours. Of those practices that scaled back hours, the average reduction was 16 hours per week. 48% of practices maintained the same hours, and fewer than 2% of practices had increased hours. Most practices laid off or furloughed less than 1 FTE (0.36 and 0.76 average FTEs respectively). Despite reducing staff, most practices allocated more funds towards wages and salary while decreasing spending on marketing, equipment, maintenance, and other areas.

FIGURE 56: OPERATIONAL STRATEGIES



Strategies for COVID-19

To address cash shortfalls, more than 60% of respondents indicated they had applied or intended to apply for U.S. Small Business Administration (SBA) loan programs (Figure 58). This was the most common strategy reported to maintain cash flow. About 60% of practice owners indicated they would forgo their own salary, and 60% said they would pull from business cash reserves. About 35% of respondents indicated they would rely on a business line of credit or use a personal asset to infuse cash into the practice.

For respondents planning to use an SBA loan, over 90% reported the Paycheck Protection Program as their loan choice. Almost 27% of respondents planned to use 100% of their SBA loan funds for payroll, and an additional 62% anticipated using more than 50% of funds for payroll. Practice owners showed strong prioritization on maintaining payroll and staff, cutting in other areas such as marketing and maintenance when possible.

FIGURE 58: CASH SHORTFALL STRATEGIES



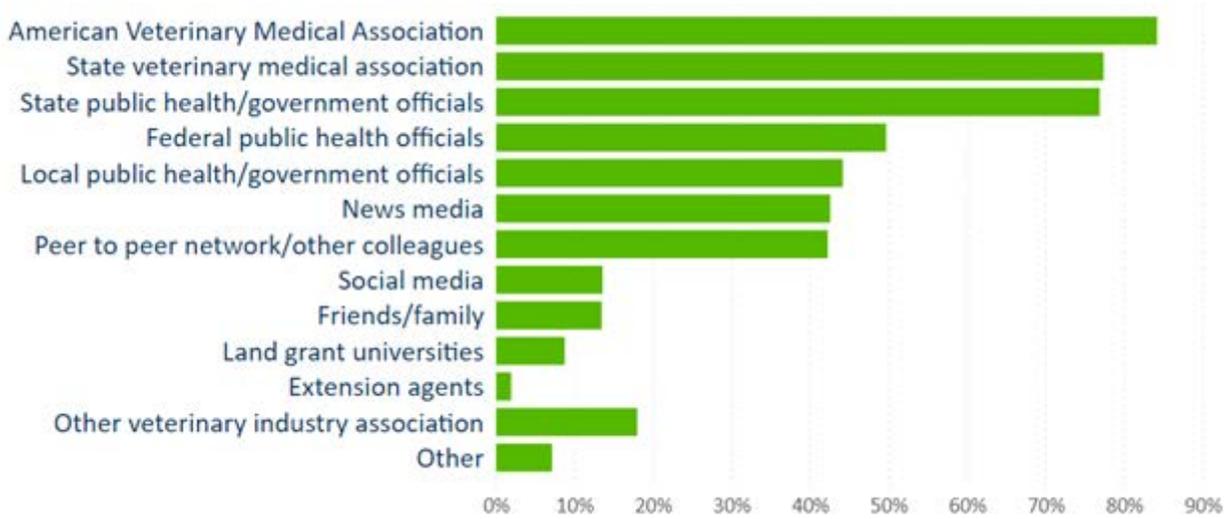
Over 75% of practices reported their clients had started buying pet food or medication online, likely in response to COVID-9. Of those, 73% of practices indicated clients had switched to buying online directly from the practice, and 23% said clients had switched to other online retailers (mostly Chewy, Pet Meds, and Amazon). 4% of practices reported having no online sales platform. For practices that don't provide online sales, doing so might help mitigate cash flow difficulties.



23% of practices that saw clients purchase online reported their clients switched to online retailers like Chewy, Pet Meds, and Amazon.

We also asked respondents where they were turning to get information about COVID-19, and 85% listed the AVMA as their most relied upon source of information (Figure 59). This was followed by state veterinary associations, and state public health and government websites. Ongoing efforts by trusted and reliable organizations to provide information and guidance will be critical as practices continue to navigate client needs and implement strategies to mitigate financial impact on their businesses.

FIGURE 59: MOST RELIED ON SOURCE OF INFORMATION



Summary

The results of our survey on COVID-19 encompass practices of different practices, species focus, and size, all across the United States. The impacts seen were far-reaching, affecting client traffic, cash shortfall, and supply shortages. As client traffic decreased, cash shortfalls began to occur. Supply shortages were observed across many categories, with PPE and sanitation supplies being the hardest hit.

Practices across the country quickly responded to the impact of COVID-19 by implementing measures to protect employees, clients, and patients. Limiting social contact was implemented by 98% of practices. Practices also changed how they allocated funds, spending more on payroll and less on items like marketing and maintenance. Clients began purchasing products online, and many practices offered telehealth and telemedicine services.

Most respondents relied on the AVMA and state VMAs to obtain much-needed information. In response to economic impacts, many planned to take SBA loans, with most opting for the Payment Protection Program. Most planned to use 50% or more of the funds for staffing. The second most cited cash shortfall strategy was practice owners foregoing their own salary. Veterinarians are known for high levels of compassion, and this shows in practice owners' prioritization of employee, patient, and client health, even at their own financial expense.

The impacts, response, and strategies observed in this data show resiliency in a profession that experienced fast and unexpected negative fallout from the pandemic. Identifying strategies and responses of practices is one of the first steps on the road to recovery. Continued information, support, and resources are needed to ensure that our essential profession strengthens in 2020 and beyond.

SUMMARY

The state of the veterinary profession in 2019 was strong, with many changes and opportunities observed in the data. Income, debt, and job offers all showed positive signs with low employment, increasing income, and decreasing debt. The profession continued to grow younger with more women DVMs each year. These changes bring opportunities for recruiting and retention as workplace needs and culture change. Practices have opportunities to diversify revenue, reduce the gender pay gap, and combat the negative impacts of COVID-19.

There are many trends observed in 2019 that are cause for positive reflection. 94% of new veterinarians obtained employment or advanced education opportunities shortly after graduation, and 2019 saw an all-time high of zero-debt graduates, with average debt levels upon graduation decreasing. For all veterinarians, overall income increased, and unemployment levels were low.

Many changes to the profession were observed regarding debt, income, work preferences, and wellbeing. As women continue to enter the profession, persistence of a gender pay gap poses issues for overall economic strength of the profession. This gap persists throughout careers, with mid-career practice owners at a \$97,000 difference. Increasing rates of millennials in the workforce also present opportunities to increase diversity of the veterinary profession and shift workplace cultures in ways that support inclusion, wellbeing, and economic strength. Wellbeing continues to be one of the most critical issues of the profession, touching an entire community. Long work hours and student debt are among the factors impacting veterinarians' quality of life. Given the strong link between wellbeing and income, increasing income and reducing pay gaps provides high ROI, benefiting the entire profession.

With change comes opportunity to further strengthen the profession. The distribution of student debt varies by college, presenting opportunities for colleges to communicate horizontally and share successful strategies to reduce student loan debt (financial counseling, need-based scholarships, etc.). Conversations among education, government, and industry are needed to tackle these issues head on by identifying and implementing tactics to reduce debt. Continued work is needed to battle both increasing debt levels and gender pay differences to ensure a stronger profession and increased wellbeing. Diligent focus is needed on strategies that reduce pay gaps such as education and enforcement of equitable pay policies and tactics. Employers have opportunities to shift tactics that attract and retain talent in a way that strengthens the profession for decades to come. Rural practices that have difficulties attracting candidates would benefit from providing economic and wellbeing benefits that millennials desire. Strategies like flexible scheduling, mental health days, and paths towards practice ownership can increase wellbeing for veterinarians.

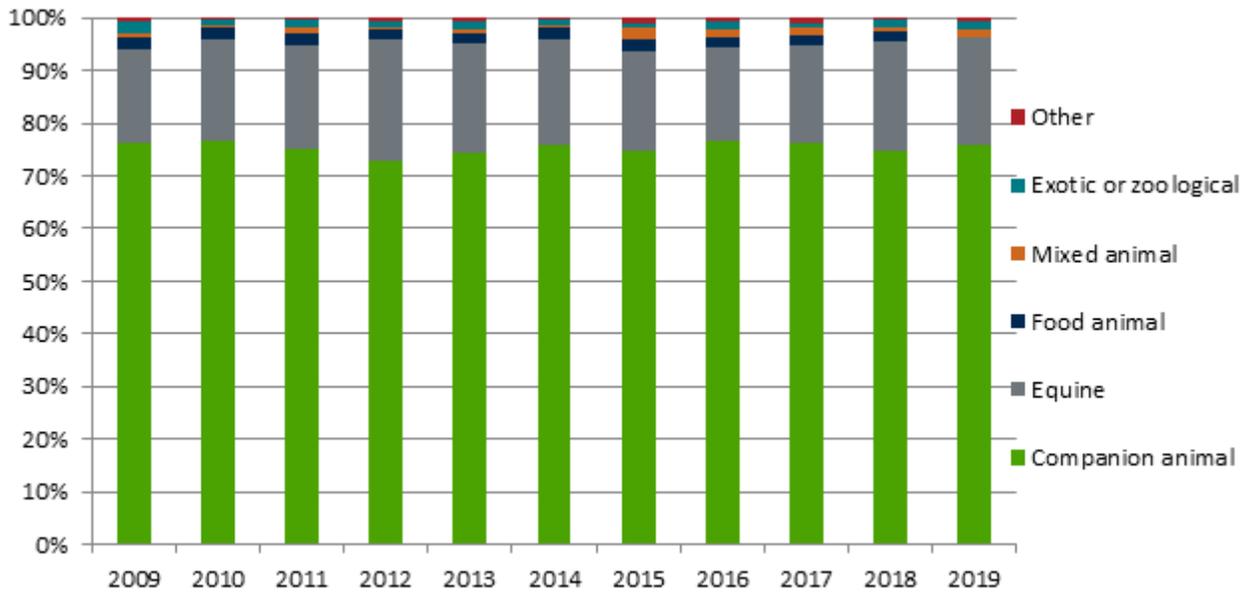
The entrance of a global pandemic further changed the landscape of veterinary medicine, with health and economic impacts. The profession quickly responded by sharing information, aligning resources with practices, and adapting business practices to ensure the safety of clients, patients, and employees. Further investigation is necessary and underway to understand the unique challenges the profession is facing, especially in the face of an unprecedented global pandemic. The information provided in this report can be used to engage in conversations that confront these issues directly. Veterinarians have always shown strength through compassion, and this was observed throughout 2019 and during the tumultuous beginning of 2020. Together, our community can move forward together, strengthening an industry that provides an essential function to society.

APPENDIX

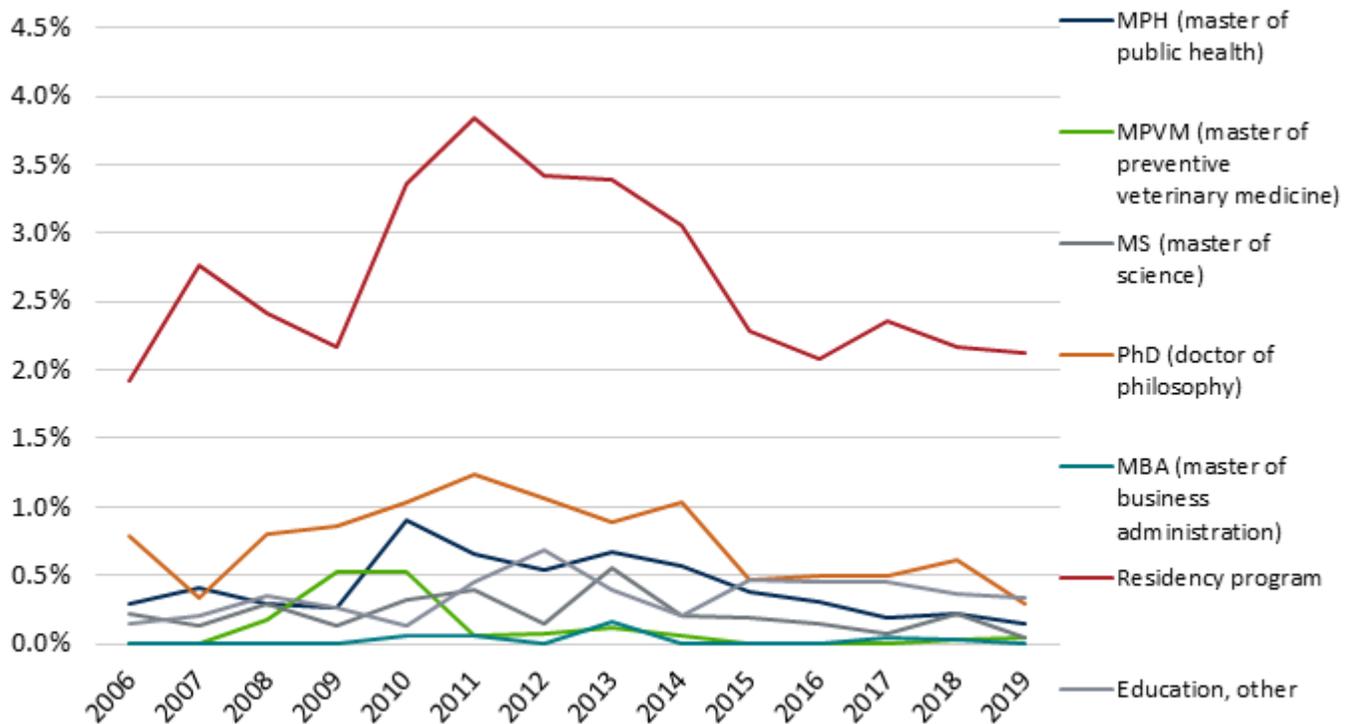
APPENDIX A: RESPONSE RATE BY VETERINARY COLLEGE, 2019

School name	Number of grads	# of returns	Response rate
Auburn University	121	121	100.0%
Lincoln Memorial	102	102	100.0%
Louisiana State University	83	83	100.0%
Mississippi State University	91	91	100.0%
North Carolina State University	99	99	100.0%
Oklahoma State University	84	84	100.0%
Purdue University	83	83	100.0%
Tuskegee University	49	49	100.0%
University of California-Davis	133	133	100.0%
VA Tech & University of Maryland	123	123	100.0%
Texas A & M University	128	127	99.2%
Cornell Veterinary College	96	95	99.0%
University of Tennessee	84	82	97.6%
University of Wisconsin	80	77	96.3%
University of Georgia	112	107	95.5%
University of Florida	111	104	93.7%
University of Minnesota	100	92	92.0%
University of Missouri-Columbia	110	100	90.9%
Western University of Health Sciences	103	87	84.5%
The Ohio State University	153	122	79.7%
University of Illinois-CVM	126	99	78.6%
University of Pennsylvania	123	96	78.0%
Iowa State University	149	111	74.5%
Cummings SVM at Tufts University	93	67	72.0%
Midwestern	97	68	70.1%
Michigan State University	109	73	67.0%
Oregon State University	55	36	65.5%
Colorado State University	142	91	64.1%
Washington State University	126	76	60.3%
Kansas State University	112	59	52.7%
Total U.S. Schools	3177	2737	86.2%
St. George's University	172	72	41.9%
Ross University	458	210	45.9%

APPENDIX B: SPECIES FOCUS OF INTERNSHIP



APPENDIX C: DISTRIBUTION OF NEW VETERINARIANS IN ADVANCED EDUCATION



APPENDIX D: REGRESSION MODEL FOR VARIATIONS IN INCOME

Variables	Coefficient	Variables	Coefficient
Companion exclusive	---	2 digit year	\$1,691 ***
Food exclusive	\$5,952 ***	Age	\$129 **
Food predominant	\$1	Female	(\$2,639)***
Mixed Practice	(\$3,985) ***	Hours per week	(\$107)***
Companion predominant	(\$402)	DVM debt per \$1,000	\$5 **
Equine	(\$23,926) ***	Region 0	\$1,257 *
Federal Govt	(\$9,296) ***	Region 1	\$2,425 ***
Uniformed Services	(\$8,220) ***	Region 2	\$914
College or University	(\$40,057) ***	Region 3	---
State or Local Govt	(\$843)	Region 4	(\$426)
Industry	\$13,995 ***	Region 5	(\$2,501)***
Non-profit	(\$13,907) ***	Region 6	(\$1,348)**
Other Employment	(\$7,998) **	Region 7	\$2,254 ***
MPH	(\$49,430) ***	Region 8	\$2,252 ***
MPVM	(\$37,501) ***	Region 9	\$4,366 ***
MS	(\$37,252) ***	Outside of the U.S.	\$1,578
PhD	(\$39,376) ***	Suburban	---
MBA	(\$29,786) ***	Urban	\$271
Internship	(\$40,434) ***	Rural	(\$3,266) ***
Residency	(\$34,236) ***	constant	\$52,720 ***
Other Education	(\$34,436) ***		

***p val < 0.01 **p val < 0.05 *p val < 0.1

APPENDIX E: REGRESSION MODEL FOR VARIATIONS IN AVERAGE DEBT

Variables	Coefficient	Variables	Coefficient
(Constant)	-106,908.399 ***	Very low Tuition	baseline
School region 0	-81,650.318 ***	Low Tuition	39,201.676 **
School region 1	-87,899.159 ***	Median Tuition	65,456.470 ***
School region 2	-3,672.059 *	High Tuition	76,189.345 ***
School region 3	baseline	Graduation Year - 2000	3,437.274 ***
School region 4	19,984.653 ***	Age	2,827.665 ***
School region 5	11,168.700 ***	Gender: F=1, M=0	6,913.028 ***
School region 6	17,943.784 ***	Ethnicity: Caucasian =1	-2,209.102
School region 7	-13,411.816 ***	School: Public= 0/ Private=1	81,294.837 ***
School region 8	3,077.033	Resident / Non-Resident	35,189.153 ***
School region 9	-3,944.664 **		

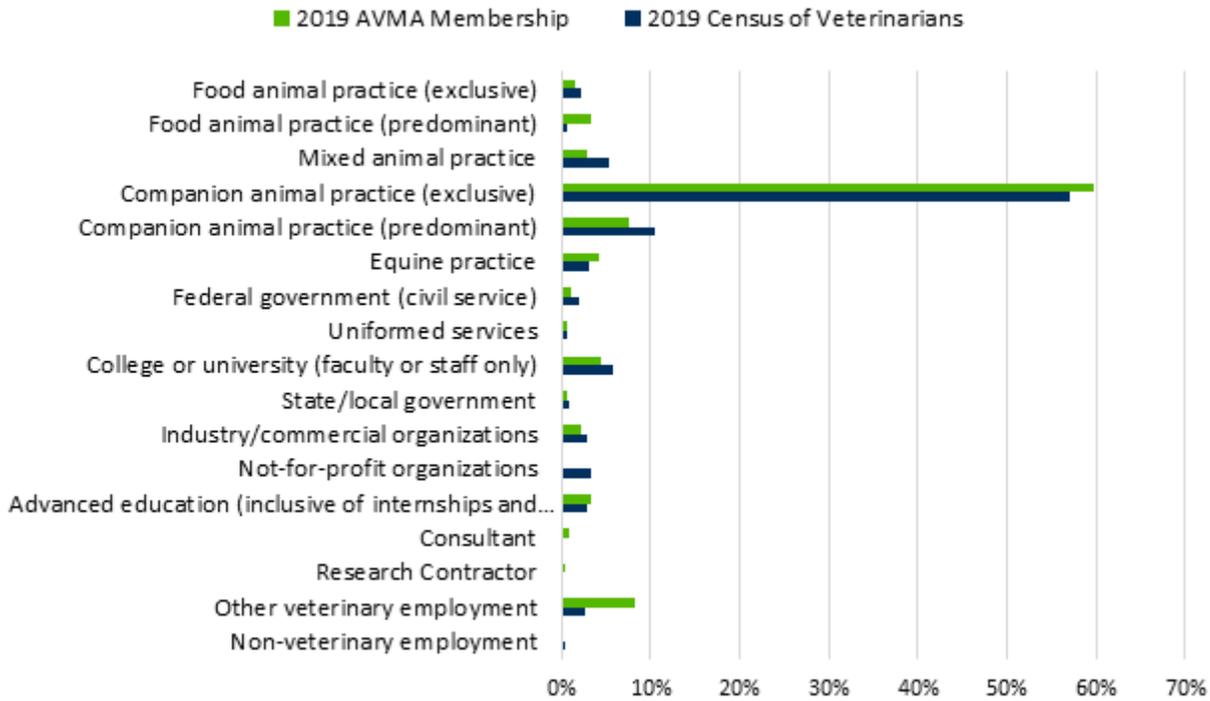
***p val < 0.01 **p val < 0.05 *p val < 0.1

APPENDIX F: REGRESSION MODEL PREDICTING DEBT-TO-INCOME RATIOS

Variables	Coefficients	Variables	Coefficients
(Constant)	-1.767 ***	Auburn University	-1.245 ***
Grad year - 2000	0.052 ***	Tuskegee University	0.02
Age	0.060 ***	University of California-Davis	-1.03 ***
Gender: Female=1	0.167 ***	Colorado State University	-0.64 ***
Have children: No=1	0.048	University of Florida	-0.62 ***
Resident/Non Resident	0.779 ***	University of Georgia	-1.22 ***
Anticipated Work hours/week	0.028 ***	University of Illinois	-0.73 ***
Work at least 48 weeks/year	0.042	Iowa State University	-0.68 ***
No. of offers received	-0.063 ***	Kansas State University	-0.11
Admitted Before earning degree	baseline	Louisiana State University	-0.87 ***
Bachelor's degree	0.282 ***	Tufts University	-0.719 ***
Master's degree	0.308 ***	Michigan State University	-0.23 ***
Doctorate degree	-0.012	University of Minnesota	0.31 ***
Other Professional degree	-0.450	Mississippi State University	-0.60 ***
Other degree	0.604 **	Purdue University	-0.936 ***
Region 0	0.102	Cornell University	-1.23 ***
Region 1	-0.098	Oklahoma State University	-0.94 ***
Region 2	-0.236	University of Pennsylvania	-0.44 ***
Region 3	0.052	Texas A&M University	-1.544 ***
Region 4	-0.197	Washington State University	-0.95 ***
Region 5	-0.156	University of Missouri-Columbia	-0.55 ***
Region 6	-0.155	Oregon State University	-0.62 ***
Region 7	-0.006	University of Tennessee	-0.44 ***
Region 8	-0.278 *	Virginia-Maryland Regional	-0.68 ***
Region 9	-0.466 ***	North Carolina State University	-1.17 ***
Outside the US	baseline	University of Wisconsin	-1.06 ***
Food animal practice (exclusive)	-1.704 ***	Western University - CA	1.333 ***
Food animal practice (predominant)	-1.599 ***	Lincoln Memorial University	-0.39 **
Mixed practice	-1.477 ***	Midwestern University	1.31 ***
Companion animal practice (exclusive)	-1.528 ***	The Ohio State University	baseline
Companion animal practice (predominant)	baseline	Very low Tuition	baseline
Equine practice	-0.790 ***	Low Tuition	0.72
Federal Government (civil service)	-1.616 ***	Median Tuition	0.98 **
Uniformed services	-2.387 ***	High Tuition	1.22 ***
College or University (Faculty or staff only)	0.226		
State or Local Government	-1.149 ***		
Industry or commercial organizations	-1.892 ***		
Not-for-profit organizations	-1.085 ***		

***p val < 0.01 **p val < 0.05 *p val < 0.1

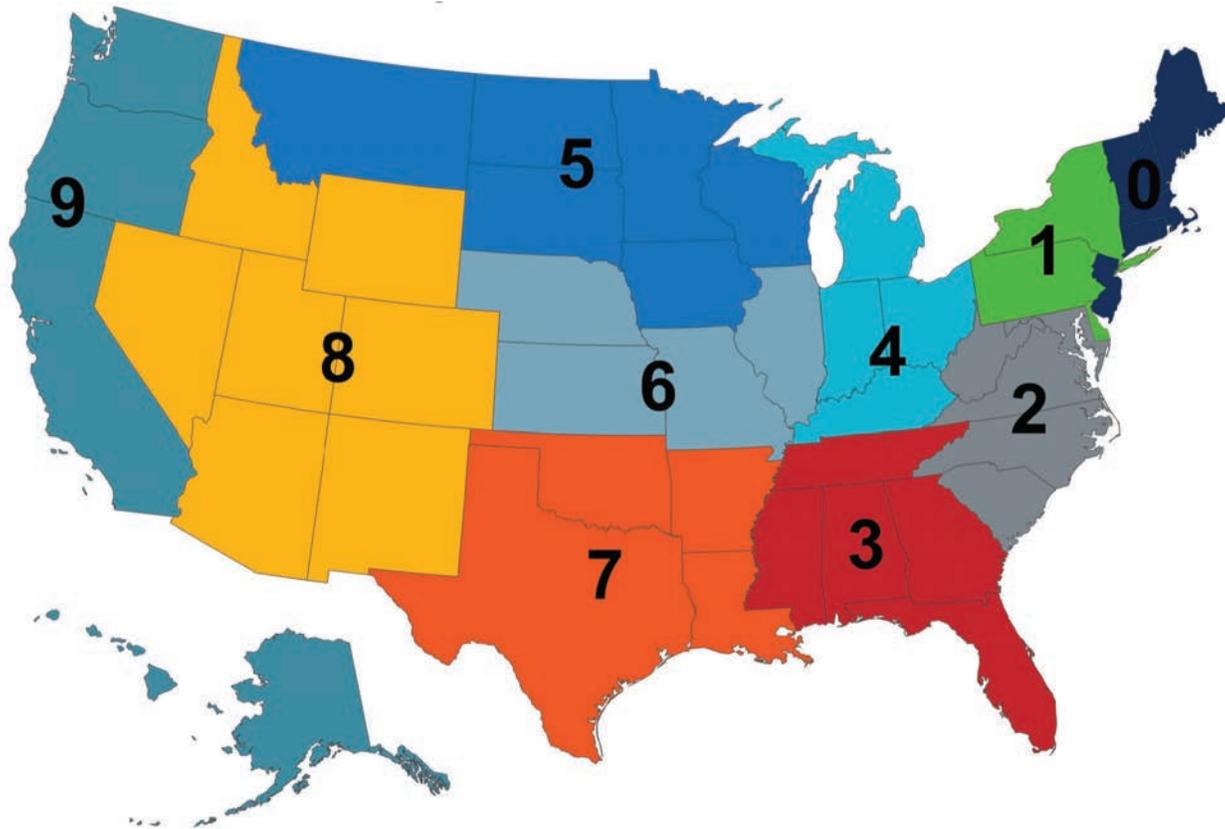
APPENDIX G: RESPONSE RATES



	2019 Census of Veterinarians		AVMA Membership	
	N	Percent	N	Percent
2010-2017	1,776	52.1%	27,893	33.0%
2000-2009	1052	30.9%	20,953	24.8%
1990-1999	427	12.5%	17,310	20.5%
1980-1989	119	3.5%	14,570	17.3%
1970-1979	32	0.9%	3,595	4.3%
1960-1969	2	0.1%	104	0.1%
Total	3,408		84,431	



APPENDIX H: U.S. REGIONS



APPENDIX I: UNDEREMPLOYMENT BY GENDER

