

Pet Healthcare in the U.S.: Another Look at the Veterinarian Workforce

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Background

In 2021, a study was published suggesting that a shortage of nearly 15,000 companion-animal veterinarians could well exist by 2030, representing an overall shortfall of veterinarians in pet healthcare of approximately 16%.¹ However, additional data have become available since that work was completed, including updates on such critical factors as trends in demand for pet health services, veterinary school enrollments, immigration of foreign veterinary graduates, and career attrition rates for veterinarians. With this new information, another look at the adequacy of the veterinarian workforce for delivery of pet healthcare in the U.S. is timely.

Methods

Assessing the adequacy of the veterinarian workforce requires consideration of both the demand for, and supply of, veterinarians. Fundamental economic theory would suggest that such an endeavor might involve formulation and analysis of traditional supply and demand curves. However, using such an approach would result in several shortcomings stemming from violations of the fundamental assumptions upon which the traditional model is based. For analysis of this professional labor market, the most critical of these violations would be:

- The assumption that all workers are homogeneous with identical skills, preferences, and productivity;
- The assumption of a perfectly competitive market with perfect information;
- The assumption that profit maximization or cost minimization are the singular goals of employers, employees, or customers;
- The assumption that entry barriers are non-existent; and
- The assumption that supply and demand curves are stable and do not change over time.

Because of the complexity of specific labor markets, supply and demand models must be supplemented with other theories and empirical evidence. In fact, labor shortages are virtually never calculated using supply and demand curves except in theoretical settings because the data are never sufficient to do so.

For these reasons, the current study uses available trend information on demand and supply for veterinarians, as opposed to an econometric estimation of demand and supply curves. Through a “nowcasting” or “systems modeling” approach, real-time or

near-real-time data are used to characterize both the current state of this labor market and important trends in supply and demand. From that point, a forecast of the likely outlook for veterinarian labor in the companion animal sector is generated.

Using these methods, whose validity is well established in the field of labor economics, rates of entry to, and exit from, the U.S. pet healthcare veterinary workforce are analyzed along with the existing population of practicing veterinarians. Expectations for fluctuation in capacity and workflow are also considered based on both internal and external factors. To complete the process, however, it is critical to include consideration of three separate markets: the market for veterinary medical services, the market for veterinarians (a professional labor market), and the market for veterinary medical education. In the end, the results provide an actual projection for both numbers of veterinarians and an expectation for the number of veterinarians needed.

Trends in demand for pet healthcare

Research results from the University of Florida indicate mean quarterly expenditures per U.S. household for veterinary service users (corrected for inflation) increased at an average compounded rate of +2.95% per year from 1980 through 2021.² Notably, six separate recessions occurred between 1980 and 2021 – including the COVID pandemic – and in spite of some relatively minor fluctuations along the way, the overall spending trend during this 41-year span has exhibited a consistent upward trajectory (see Figure 1).

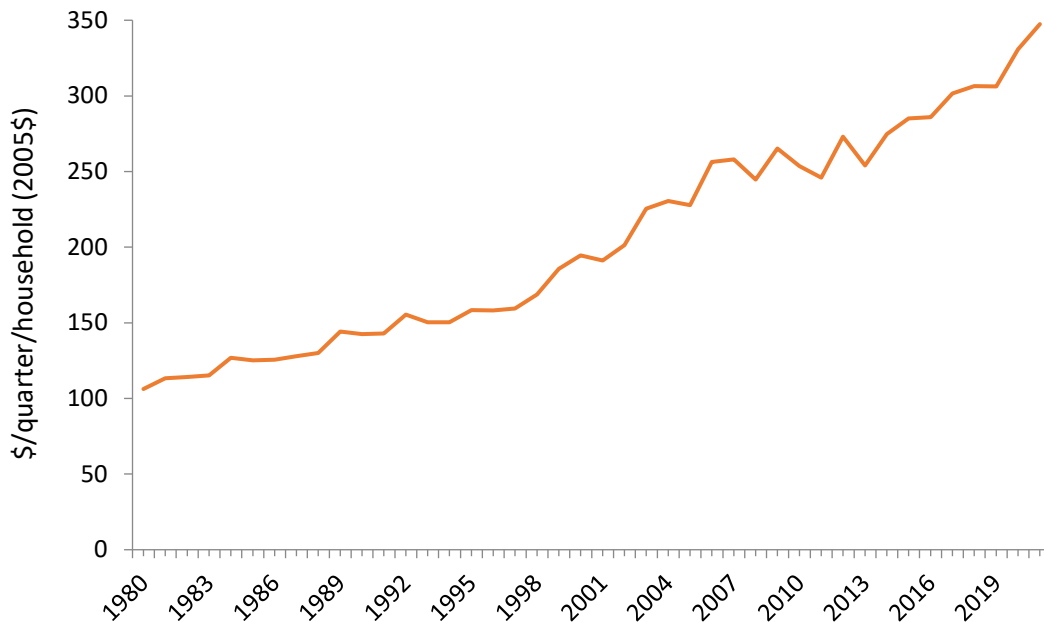


Figure 1. Mean quarterly expenditures per household for veterinary service users, 1980 through 2021.² (reproduced here with permission)

In effect, correcting for inflation adjusts for the potential impact of fee increases in veterinary medicine. Along with the remarkable upward trend in spending per household, the same robust study reported that the proportion of households with veterinary service expenditures among households with pet-related expenditures is also increasing – at an average rate of +1.64% per year between 2010 and 2021 (see Figure 2).²

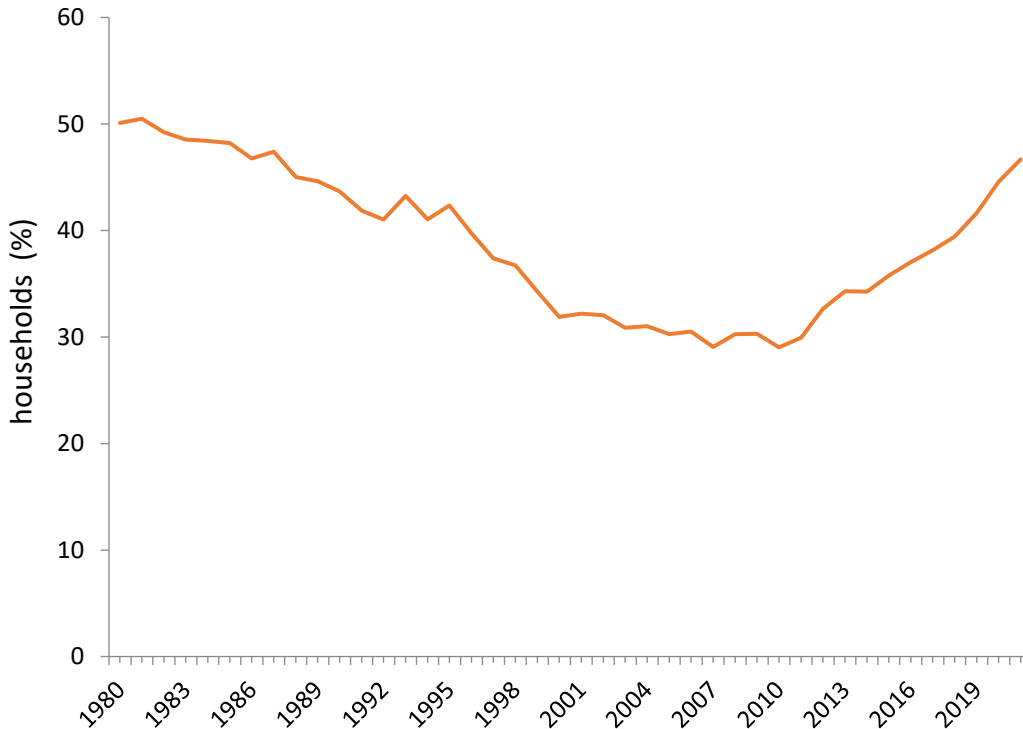


Figure 2. Proportion of households with veterinary service expenditures among households with pet-related expenditures, 1980 through 2021.² (reproduced here with permission)

These results suggest that, if the total number of U.S. pet-owning households remained constant between 2010 and 2021, aggregate demand for veterinary services would have increased by about +4.6% per year (2.95% + 1.64% = 4.59%). However, other data sources indicate that the total number of U.S. pet-owning households has also increased. The American Pet Products Association estimates that 86.9M U.S. households owned pets in 2023³, an increase from their 1988 estimate of 51.7M⁴. This represents an annual, compounded growth rate of +1.5% in the total number of U.S. pet-owning households. When combined with the +4.6% annual increase in demand per household...

these data suggest a total rate of increase in demand for pet health services of +6.1% per year in the U.S. pet healthcare market.

How many veterinarians are needed to meet the current demand for pet healthcare services?

In 2022, an estimated 125,465 veterinarians were actively engaged professionally in the U.S., of which 69.3%, or 86,947 veterinarians, were reported to be employed in companion animal practice. An additional 4.9% (6,148 veterinarians) were engaged in mixed animal practice and another 6.2% (7,779 veterinarians) worked at colleges or universities.⁵ Both of these latter two sectors generally include a substantial amount of companion animal practice – perhaps as much as 50%. If we consider all those

engaged in companion animal practice and half of those engaged in mixed animal practice or college/university work, the total workforce dedicated to meeting the demand for pet health services in the U.S. included an estimated 93,911 veterinarians in 2022, or nearly 75% of the entire veterinary workforce (93,911 divided by 125,465).

An additional factor must be considered to accurately estimate the number of veterinarians needed to meet the U.S. demand for pet health services in 2022. Studies conducted annually since 2014 have determined that veterinarians collectively feel so overworked that more than 20% of respondents every year have consistently reported a desire to work fewer hours, even if it resulted in decreased compensation^{5,6}. In fact, it would have taken over 4,500 additional full-time equivalent (FTE) veterinarians to fully accommodate the net desire to work fewer hours in 2019, the most recent year that this specific number was reported⁶. Assuming that the situation hasn't changed since 2019, and if 75% of these individuals provided pet health services – as was the case with the overall veterinary workforce – then another 3,397 veterinarians would have been required. In combination with the 2022 companion animal workforce calculation above, an estimated total of 97,308 veterinarians were needed to meet the U.S. demand for pet health services in 2022.

How many additional veterinarians will it take in 2030?

Using this current (2022) number of 97,308 veterinarians needed along with the projected rate of increase in demand, it is possible to estimate the number of veterinarians necessary to meet the demand for pet health services in 2030, as in the previous study¹. If a +3.0% annual growth in demand occurs, an estimated total of 123,267 companion animal veterinarians will be needed in 2030 to meet the demand for pet health services. At a +4.0% annual growth, 133,173 veterinarians will be needed in 2030. These results suggest that 29,356 to 39,262 additional companion animal veterinarians will be needed by 2030. Note that, to be conservative and to allow for a potential moderation in the annual rate of increase in the demand for pet health services, both selected growth rates are considerably lower than the overall +6.1% annual rate of increase in demand for pet health services estimated above. If the full +6.1% annual rate of increase comes to bear, the estimated total number of companion animal veterinarians needed in 2030 would be much greater.

In addition to meeting overall growth trends, additional veterinarians will be needed to replace those who leave the profession due to retirement or other reasons. Based on a published 2021 age distribution of U.S. veterinarians,⁷ over 12,500 companion animal veterinarians can be expected to retire by 2030. Further, over 3,000 more can be expected to leave the profession during this period due to death or disability, based on published actuarial tables.⁸ Considering projected growth of +3.0% to

+4.0% together with anticipated separations suggests that a total of about 45,000 to 55,000 additional companion-animal veterinarians will be needed in 2030.

Trends in the Supply of Veterinarians

The primary source of new veterinarians in the U.S. is veterinary college graduates. Based on current enrollments across AAVMC member institutions in the U.S., and adding the U.S. citizens enrolled at colleges/schools outside the U.S., an estimated 4,300 new graduate veterinarians were expected to enter the employment market in 2023.⁹ With the addition of several new schools and increasing class sizes at several more, enrollments are experiencing an upward trend and the total number of graduates is consequently expected to increase to around 5,100 by 2027.⁹ Considering this upward trend, and assuming that about 75% of these are likely to enter companion animal practice, just over 29,000 new graduates could reasonably be expected to join the national pet healthcare workforce by 2030.

Data from the International Council for Veterinary Assessment (ICVA) indicate that, over the past 10 years (i.e., since 2012-13), an average of 282 foreign-trained veterinarians have passed the North American Veterinary Licensing Exam (NAVLE) each year.¹⁰ Based on these numbers, and again assuming that 75% are likely to enter companion animal practice, nearly 1,700 additional veterinarians might be expected as entrants to the U.S. pet healthcare workforce by 2030.

Together, the new domestic and foreign veterinary graduates will add about 31,000 new companion animal veterinarians to the U.S. pet healthcare workforce by 2030. Unfortunately, when compared to the need for 45,000 to 55,000 companion-animal veterinarians in 2030 as estimated above, these results suggest that...

A shortage of 14,000 to 24,000 companion-animal veterinarians could well exist in the U.S. pet healthcare market by 2030, representing an overall shortfall of veterinarians of approximately 11% to 18%.

In reflecting on this analysis, several additional important points warrant mention. Consider the following:

- As mentioned earlier, many U.S. veterinarians feel overworked and would like to decrease their hours.^{5,6} Traditionally, situations of overemployment such as this arise when strong market demand leads employers to require longer hours than employees prefer.¹¹
 - The primary reasons for those wanting to decrease hours were the desire for a better work-life balance (33% of respondents) and to improve mental health (stress, anxiety, burnout – 32% of respondents).⁵ In fact, 40% of respondents indicated having considered leaving the veterinary

profession, with the most commonly cited primary reasons being burnout/mental health, hours worked, and work-life balance.⁵

- As millennials are now the generation comprising the greatest proportion of the veterinarian workforce, these issues stand to gain even greater importance in the future because “...Millennials as a group prioritize well-being and a healthy work-life balance.”⁷ These results strongly suggest that failure to address the current shortage of veterinarians successfully might well lead to an even greater shortage as we go forward.
- Urgency is even more apparent considering that for the past three years, veterinarians have actually reported working a greater number of hours in spite of their expressed desire to work less. Coincidentally, or perhaps consequently, the distribution of burnout scores in 2022 was at its highest level since 2015 (when it was first measured).⁵ It is highly unlikely that these conflicting trends will be sustainable in the long run. Increased rates of separation and/or part-time workers could easily transpire, again potentially exacerbating the current shortage going forward.
- Although the current analysis considers separations from the veterinary profession due to retirement and death/disability, nothing was included to account for career changes. Because data are not available to characterize such departures, it would be difficult to confidently include them in the model in a quantitative manner. Regardless, these situations do exist and would only stand to make the projected shortage even worse.
- It was estimated that, in 2016, approximately 17% of all dogs and 46% of all cats in the U.S. didn’t even see a veterinarian.¹² In 2020, those proportions were estimated as 24% for dogs and 35% for cats.¹³ Previously cited research results from the University of Florida suggest that even though the proportion of households with veterinary service expenditures among households with pet-related expenditures is on a significant upward trend, still only 47% of pet-owning households spent money on veterinary services during 2021.² Although the size of this unserved/underserved market is the subject of some debate, its ongoing existence has been recognized for many years. It is not clear how much of this might be directly or indirectly related to the number of veterinarians available. In fact, some of this situation could be attributable to difficulty in scheduling appointments, long wait times, and pursuit of effective substitutes for veterinary services, all of which might be associated with a shortage of veterinarians. If this is indeed occurring, the trend could be detrimental to the long-run health of the profession. Admittedly, there will always be some pets that do not receive veterinary care, but if we aspire to provide pet healthcare to any portion of this underserved market in the future,

it will require an even greater number of veterinarians in companion animal practice than already projected.

Without question, this situation is concerning and the implications are substantial.

What are the potential consequences?

As discussed the earlier report,¹ consequences of a veterinarian shortage are widespread.

- **Animal welfare implications:** Pets that go without veterinary care can be expected to experience greater rates of morbidity and mortality. Further, lack of access to adequate veterinary care is known to be one of the greatest risk factors for animals to be surrendered to a shelter. Assuring adequate access to pet healthcare will undoubtedly improve the welfare of millions of pets.
- **Implications for equity and access to care:** Previous studies indicate that, on average, the cultural, socioeconomic, and geographic characteristics of those pet owners who are underserved with respect to veterinary care also collectively describe communities that all-too-often experience systemic marginalization in our society.¹⁴ Enhancing access to veterinary care for underserved pet owners will clearly have a disproportionately positive impact in historically disadvantaged communities, both in the near term and in the long run.
- **Public health implications:** The critical importance of pets to the overall well-being of humans, both physical and mental health, is becoming more and more widely recognized. In addition, zoonotic diseases – those that can be transmitted from animals to humans – are much more common in pets than most people realize. Assuring adequate access to veterinary healthcare will markedly improve public health, and decrease healthcare costs, for millions of U.S. pet owners.
- **Economic implications:** Total annual expenditure for those who utilized veterinary services was most recently estimated at \$367/dog and \$253/cat.¹³ Nationally, veterinary sector sales in the U.S. pet market were estimated at \$36.8 billion in 2022.¹⁵ With the veterinarian shortage estimated at 11% to 18%, and considering together the direct, indirect, and induced outputs, providing adequate access to veterinary care for pet owners would likely represent a multi-billion dollar total annual positive impact on the U.S. economy, with a large portion being veterinary earnings.
- **Well-being implications:** Since at least 2014, approximately 20% of U.S. veterinarians every year have expressed a desire to work fewer hours per week, even if it meant a lower level of compensation.^{5,6} With team well-being and mental health already being top concerns in veterinary medicine,⁵ and with one in five U.S. veterinarians already feeling overworked, the added stress of a

shortage of the projected magnitude would have a substantial negative impact. Increasing rates of burnout and employee turnover would likely transpire as a consequence. Assuring an adequate pet healthcare workforce will be a critical factor in improving the well-being of thousands of pet healthcare teams.

- **Business implications:** Experience from the COVID pandemic provides insights on what to expect from the business perspective with a workforce shortage. Anecdotal evidence suggests that longer wait times and an inability to schedule elective procedures lead to decreased client satisfaction. In addition, stress associated with chronically overworked staff can be expected to yield higher rates of turnover and/or burnout. Consistent, high-level medical outcomes could well be threatened as a result. Assuring an adequate pet healthcare workforce will help sustain high levels of client satisfaction and medical outcomes.

So, what options do we have?

To address this situation, one option is to expand enrollments across AAVMC member institutions toward increasing the number of veterinary college graduates. In fact, such a trend is well underway – over the past five years, the total enrollment of veterinary medical students at U.S. institutions plus U.S. citizens enrolled at COE-accredited institutions outside the U.S. has increased approximately 2.8% per year.⁹ In addition, several institutions are currently planning to increase class size and several new colleges/schools are in various stages of development. However, after considering all of these increases (along with historic rates of retirement, death/disability, and entry of foreign-trained veterinarians), over 800 additional new entrants would be needed each year just to keep up with an increase in the U.S. demand for pet health services of +3.0% per year. At a demand growth rate of +4.0%, the need would exceed 1,800 additional new entrants per year. Note that these numbers would only meet the growing demand; the current shortage situation would continue unabated and the underserved pet healthcare market would continue to exist.

Other than incremental enrollment increases for existing colleges/schools of veterinary medicine, any substantial increase in class size would take at least six years from the point of decision to the initial increase in graduates for most institutions. Planning and completion for any needed boost in facilities could take substantially longer, as would likely be the case for starting an entirely new program. Although these decisions warrant serious consideration for the medium and long-term, meeting the projected 2030 shortfall will not likely be feasible through a singular focus on increasing the number of graduating veterinarians.

Fortunately, other good options for expanding access to care exist. First, enhancing the “practice-readiness” of graduating veterinarians stands to markedly improve their efficiency when they enter the workforce. In this regard, proficiency in culturally-competent, team-based healthcare delivery systems across the entire spectrum of care will be vital.

Further, approaches that consider the entire healthcare team warrant strong consideration. Research results from 2018 indicate that, on average, the positive contribution to practice productivity/revenue in the U.S. of one additional veterinary nurse/technician is approximately 18.3%.¹⁶ This suggests that, with all else being equal, having one additional veterinary nurse/technician was associated with 18.3% higher revenue for an average-sized practice.^a Similarly, a recent study of companion animal practices in Ontario also found that a greater number of veterinary nurses/technicians per veterinarian was associated with higher annual gross revenues per veterinarian.¹⁷ Expanding capacity in the veterinary medical workforce is not limited to just growing the number of veterinarians; increasing the number of veterinary nurses/technicians presents another viable approach. Several factors actually make this an attractive option:

- Barriers to entry are much lower. In most cases, admission to veterinary nurse/technician programs is possible straight out of high school, compared to veterinary medical programs in the U.S. that generally require 2-4 years of undergraduate preparation.
- Educational turnaround time is much quicker. Completion of most veterinary nurse/technician programs is possible in only two years, whereas most veterinary medical programs in the U.S. require four years to complete in addition to the 2-4 years of prerequisites.
- Training capacity is much greater. Over 200 accredited veterinary nurse/technician programs exist in the U.S. compared to just 33 veterinary medical programs.
- Beyond increasing numbers, widespread opportunity exists for improved utilization of the existing veterinary nurse/technician workforce, including veterinary technician specialists. By some estimates, veterinary practices, on average, use only about 30% of the skills and competencies for which credentialed veterinary nurses/technicians have been educated.¹⁸

Increasing capacity via veterinary nurses/technicians holds enormous potential.

In addition to veterinary nurses/technicians, it has recently been suggested that creation of a mid-level practitioner – similar in concept to a nurse practitioner or physician’s assistant in human medicine – could be an effective approach to expand

^a The size of the average practice in this study was 2.4 FTE DVMs.^{6,16}

the veterinarian's capacity.¹⁹ At present, one such educational program has been launched (Masters in Veterinary Clinical Care at Lincoln Memorial University's College of Veterinary Medicine²⁰), and several more are under consideration.

Beyond increasing /enhancing the workforce, alternative approaches to expanding access to care also exist. Greater emphasis on preventive healthcare can significantly enhance the efficiency of veterinary practice while also improving patient outcomes and decreasing the overall cost of care. By increasing efficiencies in this manner, greater emphasis on health maintenance (or wellness) plans would be expected to enable more pets to access veterinary care effectively. Further, considering the emergence of new technologies, telehealth/telemedicine offers a mode of improved access not even imagined until a few years ago. And finally, innovative practice models are starting to appear. These include creative partnerships, unique service portfolios, novel locations, atypical modes of delivery, and/or non-traditional hours of operation that all stand to extend the reach of veterinarians. Unfortunately, shifting to a greater focus on wellness, adapting new technologies, and developing innovative practice models all require enough discretionary time to work "on" the business rather than just "in" the business, and such discretionary time is an increasingly rare commodity in the current workforce shortage.

Are there potential limitations of this analysis?

The preceding analysis and associated recommendations are based on a number of key assumptions. Several of these warrant special consideration.

- Despite the use of traditionally robust sources of data,^{2,3,4,5,6} uncertainty remains in the projections for growth in demand for pet health services. Other factors to consider might include:
 - Projections previously presented by the AVMA were in the neighborhood of 3% growth per year, at the lower end of the projected growth range considered in the current analysis.¹⁶
 - Data supporting the projected growth were collected throughout most of the COVID pandemic. Over the 41 years of observations, six separate recessions occurred – and yet the consistent upward trend in spending on pet healthcare per household continued, strongly suggesting that long-term structural trends are at play. Although it will be important to continue monitoring the demand for companion animal healthcare services, these factors tend to lend confidence to the present analysis.
- The above analysis assumes that productivity per veterinarian remains the same in 2030 as in 2022. It would be reasonable to expect that service productivity per veterinarian might well increase over an 8-year period, which could be expected to partially alleviate any anticipated shortage in the veterinarian

workforce. However, the net potential effect on the projected shortage is unclear, and therefore was not included in the analysis.

- The recommendation to increase capacity via veterinary nurses/technicians inherently assumes that:
 1. Existing veterinary nurses/technicians can be more fully employed, and
 2. More veterinary nurses/technicians are available for hire.

The first of these assumptions is almost certainly true.¹⁸ However, there currently exists a substantial shortage of veterinary nurses/technicians as well.²¹ Therefore, the training capacity for these professionals will also need to be expanded.

- This analysis focuses solely on companion animal practice without considering potential workforce trends across the wide variety of career possibilities available to veterinarians. Although it is beyond the scope of this study, demand for services is expected to grow across other career pathways as well.^{6,22}
- Finally, this analysis tends to imply that merely increasing worker numbers and/or improving training can be sufficient to adequately strengthen the pet healthcare workforce. However, veterinary medicine is one of the least diverse professions, including consideration of both veterinarians and veterinary technicians.²³ To be truly effective going forward, the pet healthcare workforce must enhance diversity to become more representative of the society it serves.

So, what comes next?

The projected workforce shortage presents a substantial challenge to the veterinary medical profession.

At a minimum, continuing the ongoing expansion of veterinary medical student enrollments will be vital. Because meaningful increases in capacity can take years, institutions that are so inclined should plan accordingly. However, increased veterinary medical student enrollments will not likely to be sufficient to fully avert the projected shortage.

To effectively meet the growing need for pet healthcare in the U.S. – to provide U.S. pet owners with adequate access to companion animal veterinary services – it will be critical to adopt an intense focus on the healthcare team. First and foremost, more complete development of the roles and contributions of veterinary nurses/technicians will be essential. A rigorous exploration of issues such as core competencies, job responsibilities, educational models, compensation, credentialing, and career pathways/longevity demand immediate attention. Successful team-based healthcare delivery systems need to be identified, created, modeled, and progressively implemented. Not only will access to care be expanded and improved as a result, but

patient outcomes, client satisfaction, and the overall career satisfaction, well-being, and productivity of the veterinary medical team will be enhanced.

Beyond the healthcare team focus, expansion of preventive healthcare programs, telehealth/telemedicine, and innovative practice models will also be crucial. The broad scope of benefits accruing to improved access to care will not be limited to pet health and well-being, but will also include substantial public health, business, and economic benefits, often in traditionally underserved communities.

Because the workforce shortage is projected to worsen in coming years, and because the level of burnout in the profession is at an historic high, time is of the essence to address these challenges.

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