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Can veterinary medicine improve diversity in post-graduate training programs? Current state of academic veterinary medicine and recommendations on best practices

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ABSTRACT

The American Association of Veterinary Clinicians (AAVC) convened a Diversity, Equity, and Inclusivity working group in March 2021 to address the limited diversity (including but not limited to ethnic, racial, and cultural diversity) in clinical post-DVM graduate training programs and academic faculty. Concurrent with a working group formation, the AAVC developed a strategic plan. The central mission of the AAVC is to develop, support, and connect academic leaders to fuel the future of the veterinary medical profession. House officers and their training programs are central to all goals outlined in the strategic plan. Amongst other strategic goals, the working group identified best practices for intern and resident recruitment and selection. We report herein from the current health profession literature ways to identify and recruit talented, diverse candidates especially those with non-traditional (atypical) preparation and experience. We also provide recommendations on best practices for intern and resident selection. This document highlights holistic approaches, some of which are incrementally being incorporated into the Veterinary Intern Resident Matching Program application, that emphasize diversity as a selection criteria for intern and resident selection an important step towards building a more resilient and inclusive workforce. These include expanding candidate assessment beyond grades and class rank into a more standardized method for screening candidates that includes consideration of life experiences and talents outside of veterinary medicine.

Why Diversity Matters

Often cited as the whitest profession in the United States[1], schools and colleges of veterinary medicine are intensely focused on broadening the pipeline of diverse applicants.[2] Still, the DVM student population at AVMA accredited schools and colleges of veterinary medicine is overwhelmingly Caucasian.[3] According to the 2021 US Census, the 331 million respondents self-reported as 76.3% White, 13.4% Black, 1.3% American Indian and Alaska Native, 5.9% Asian, 0.2% Native Hawaiian/Pacific Islander, 18.5% Hispanic or Latino, and 2.8% mixed race.[4] The US Bureau for Labor Statistics 2021 data indicates that veterinary medicine lags behind other health professions in terms of racial and ethnic diversity with 93.3% reporting as White, 1.2% reporting as Black, 5.6% reporting as Asian and 4.7% reporting as Hispanic/Latino **(Table 1)**[5] This relative lack

Table 1—Percentage of various races in health-care professions compared to the 2021 US Census results from the US Bureau of Labor Statistics and US Census Bureau.

Profession	Percent (of total employed)			
	White	Black/African American	Asian	Hispanic/Latino
2021 Census results	76.3*	13.4*	5.9*	18.5*
Veterinarians	93.3	1.2	5.6	4.7
Veterinary technicians	88.5	3.6	2.3	15.3
'Other' physicians†	66.1	8.1	22.9	5.8
Surgeons	89.4	4.6	5.6	8.6
Pharmacists	70.3	7.9	19.8	6.0
Dentists	73.1	2.6	19.6	6

*Includes persons reporting only one race.
†Excludes emergency medicine physicians, radiologists, surgeons.

of diversity is important because multiple studies and reports demonstrate that health-care organizational diversity (racial/ethnic) is known to improve innovation, patient health outcomes, and financial performance in human health-care.[6,7,8] Further, health-care workforce diversity is associated with greater satisfaction with care received and improved patient-provider communication.[9] There are no data to suggest that veterinary medical health-care would fare any differently with similar diversification.

Numerous programs exist to increase under-represented minority (URM) people in STEM fields including veterinary medicine. A key program in this effort is Diversity Matters, an initiative that was developed and implemented by the American Association of Veterinary Medical Colleges (AAVMC). This program engages potential applicants and since inception almost 20 years ago has succeeded in raising URM populations from < 10% to over 25% in matriculant classes. Much of the data shared in this publication is from this program.[3] Other efforts of note include 'This is How We Role,' an award-winning outreach program developed by faculty and staff at the College of Veterinary Medicine at Purdue University. 'This is How We 'Role' includes both outreach to K-4 children and modules that teach faculty and staff how to do this outreach.[10] Other schools and colleges have well established outreach programs to disadvantaged or under-represented students designed to expose students to veterinary medicine and career opportunities and to enhance their success with the application process.[11-13] These and other efforts are paying off. Recent data shared by the AAVMC indicates a steady increase in racial/ethnic representation of DVM students at US Colleges of veterinary medicine.[3] However, there remain significant regional challenges to attract URMs into the field of veterinary medicine at several schools and colleges.[3]

State of Academic Veterinary Medicine

As this important work at the K-12, undergraduate, and professional school levels incrementally expands the racial, ethnic, and cultural diversity of new graduates, academic veterinary medicine must consider how the next generation of academicians and educators is trained and welcomed into the field. The percentage of URM faculty and administrators in veterinary medicine is low.[3] Identifying, exposing, and removing the bottlenecks and structural biases that are entrenched throughout academia and the private sector will continue to take time and collaborative effort. With relatively few Black, Indigenous, and people of color (BIPOC) individuals currently matriculating through DVM programs, data indicate that an even smaller subset is interested in an academic career. Bluntly stated, it is a challenge to recruit and retain faculty and staff of color as well as other diversity dimensions. Improvement will require that existing faculty and staff recognize and understand the pivotal importance of this effort and modify their own implicit biases and behaviors. An understanding of bias and inclusive behavior is critical to the development of a positive culture, which is crucial to the successful recruitment and retention efforts for staff, students, house officers, and faculty. The success of our training programs, the composition of our faculty and the future of our profession depend upon successfully navigating these challenges.

While many schools and colleges are rightfully acknowledging the importance of general practice veterinarians and the crucial role they play as academic educators, the majority of clinical faculty in academic veterinary medicine are board-certified specialists. While this model has numerous pros and cons, residency training and board certification is currently considered the standard for clinical academic career preparation. The Veterinary Intern Resident Matching

Program (VIRMP), administered by the AAVC, is utilized by most of the post-graduate clinical training programs in North America. Traditionally, the VIRMP application process includes a letter of intent, CV, transcripts, and a minimum of 3 standardized letters of recommendation. In 2020 and 2021, in recognition of the need to continue to diversify the profession, demographic questions were expanded on the application form. At the same time, the standardized letter of reference was changed to reduce subjectivity and the guidance for the personal statement was revised to read:

"Please provide a personal statement discussing your expectations of an internship (residency) program and your future professional goals. We encourage you to describe your anticipated contributions to your matched program. This may include how your life experiences, background, past activities or unique personal characteristics would contribute to the program in meaningful ways."

The goal of these changes was to create a more holistic process, so the applicant could be assessed by more than merely grades and class rank. Demographic data from the 2022 VIRMP program is shared as figures on the AAVC website.[14] Briefly, race and ethnicity of applicants and matched individuals for internships and residency programs mirror veterinary medical student demographics. Relative to their presence in the DVM program, men are more likely to apply for internships and residencies. However, for both intern and resident applicants and matched candidates individuals identifying as female comprise the majority gender. Because of the small number of certain programs (eg, clinical nutrition internship and sports medicine and rehabilitation residency), with similarly small numbers of applicants for those programs, the gender demographics don't always mirror that of veterinary medical students. The race of intern applicants and matched interns differs; the match rate is slightly higher for White and Asian applicants, with a lower match rate for Black applicants. Similar patterns exist among resident matches, with White and racially unknown applicants having higher match rates than LatinX and Black applicants. As the VIRMP continues to gather data over time, more robust numbers can be reported for each program type.

For the 2022 cycle, recognizing that academic performance may not mirror clinical acumen, the VIRMP offered training program sites the option to not download applicant grade point average (GPA) or class rank to support efforts toward a more holistic review process. Of the 512 training programs at academic institutions offered in the VIRMP, a total of 7 colleges of veterinary medicine opted to not download applicant GPA. These 7 colleges offered a total of 142 different training programs in the VIRMP. Of those 142 programs, 6 of the 7 opted out for only a single training program. The 1 remaining college opted out for 4 of their 23 programs. The downloaded data from those 4 programs suggests that the 'opt out' of obtaining the GPA data was done in error **(Table 2)**.

Table 2—2022 Veterinary Intern Resident Matching Program data showing the number of total applicants to a single program's small animal surgery, small animal internal medicine, anesthesia internship, and anesthesia residency compared to the number of applicants that those programs chose not to download grade point average information.

Program type	Total applications	Applications opted out
SAS residency	154	1
SAIM residency	56	58
Anesthesia internship	3	3
Anesthesia residency	20	17

SAIM = Small animal internal medicine. SAS = Small animal surgery.

Removing GPA and class rank as a consideration factor for house officer selection is a debatable topic. GPA can be problematic for several reasons. Many schools and colleges are moving to adopt pass/fail grading schemes for some or all courses making it difficult to compare GPA and class rank across programs. Based on discussions amongst the Associate Deans of Academic Affairs from the schools and colleges that comprise the AAVMC, inconsistency exists regarding what aspects of the curriculum are included in the GPA calculation. Courses that help students to develop the important clinical and professional skills needed for internships and residencies are often graded pass/fail and excluded from GPA calculations, and many programs have switched to pass/fail grading for clinical rotations (eg, 'advanced' communication, leadership, and clinical skills). The COVID-19 pandemic has also affected GPA calculations in recent years as institutions gave students the option of recording pass/fail grades instead of letter grades. A more holistic assessment of GPA involves following grade trajectory throughout the DVM professional degree program. Some students may initially struggle to find their best study and examination performance rhythm; a meaningful trend

would be seeing a student with a lower GPA in the initial semesters change to higher grades in subsequent semesters.

However, GPA during the professional program is also documented to correlate positively with faculty evaluations, in-training examinations, and board examinations, amongst other factors.[15] Veterinary ophthalmology resident candidates were advised to 'achieve high grades, publish or present information, and consider obtaining an advanced degree' to enhance their chances of obtaining an ophthalmology residency.[16] Anecdotally, resident selection committees continue to use GPA as a strong criteria for ranking because of its correlation with specialty board examination pass rates.

Class rank based on GPA is also used by internship and residency programs to compare applicants from the same institution, or to correct for perceived grade inflation when comparing applicants from different institutions. It is important to recognize the major limitations of class rank data and note that 2 applicants who appear to differ significantly in class rank may be only separated by a small difference in GPA. For example, 2 students from a recent class graduating from Tufts University that were separated by 20 places in class rank only differed in GPA by 0.116 (3.739 compared to 3.855). If grades are becoming more narrowly distributed and grade inflation is occurring, the importance of examining differences in class rank must be questioned. The VIRMP received a request to remove class rank from the application and switch to using class rank quartiles or quintiles; this discussion will continue to evolve as more institutions move to pass-fail grading.

Considering socioeconomic diversity, veterinary students from lower income backgrounds may be more likely to take part-time jobs during veterinary school and this may negatively impact their academic performance and lower their class rank and GPA. Applicants may also have been balancing studying with caregiving for younger, elderly, or ill family members. These applicants have experience with balancing priorities and hence may be better able to cope with the challenges of advanced training programs yet these, and other hidden factors, may cause them to be overlooked because of their GPA and class rank. Looking beyond these academic measures will allow selection processes to be more equitable and may enhance diversity in internship and residency programs.

A Brief Literature Review on Selection Practices

Veterinary medicine is not the only health profession that struggles with recruitment of a diverse applicant pool. The 'leaky pipeline' is a well-known phenomenon in human medicine where there is true underrepresentation of URM (specifically Black and African American people) in both the professional degree programs and later along the career paths to specialist and/or educator. The leaky pipeline, or the departure of students from a career path in health care who have previously declared this intention, is cited as an important factor that decreases the pool of diverse applicants into health care professions, and URM students have a higher rate of decreased interest than do their peers.[17]

Implicit bias results in the tendency to look for trainees who will fit into the training program's group. This is a significant barrier to diversity since 'fit' is often based on racial/cultural similarity. One study showed that even when committees had a welcoming stance to diversity, their practices unintentionally prevented them from hiring URM candidates.[18] This same group concluded that simultaneous interventions towards inclusivity in medical school and postgraduate medical education are crucial to enable the desired change.[18] A commentary in the New England Journal of Medicine Catalyst noted that the predominantly white male leaders of many medical schools and health systems must recognize that their perceptions of what leadership is, or should be, may impede progress towards a diverse and inclusive environment, despite good intentions.[19]

There are strategies and programs that improve the racial and ethnic diversity of other health care professions. In 2010, the Association of American Medical Colleges developed a holistic application review to support medical schools and colleges in a more balanced consideration to experiences, talents, and academic metrics. This process attenuates the focus on traditional metrics with an emphasis on experiences and attributes that may be more indicative of professional success.[20] A 3-pronged approach to 1 institution's general surgery resident selection increased the proportions of URM candidates who were interviewed and matched.[21] The 3 prongs include, 1) a subsidized 4-week visiting student program; 2) use of a holistic applicant review by the search committee; and 3) targeted outreach to URM candidates by a physician group comprised of URM for that institution. Four years of data collection demonstrated an increased per-

centage of URM candidates who interviewed and matched with the residency with no compromise in the more traditional applicant excellence measures. This 3-pronged approach could be adapted into the veterinary medical intern and resident selection processes.

There is little in the veterinary medical literature that addresses best practices to promote racial/ethnic diversity in postgraduate veterinary medical clinical training programs. A 5-stage selection process for small animal resident selection was recently reported, with the goal of improving the validity and efficiency of the selection process but applicant diversity was not addressed.[22] The first 2 stages are straightforward, including screening for employment eligibility, academic benchmarks, and standardized scoring of various aspects of the application package. The authors go on to recommend calls to colleagues who know the applicant with consistent questions about each, which leads to a ranking score based on the call. Candidates who are highly ranked based on the first 3 stages are invited to interview, again with consistent interview modalities and questions. The fifth stage is a simple ranking process that is based strictly on numerical scores with no further discussion in order to avoid implicit bias interfering in the selection process. This multiple-hurdle approach eliminates candidates that do not meet minimum criteria at each step. There are numerous pros and cons to this selection process. The 'multi-hurdle' approach requires that acceptable candidates be successful at each stage. The subjective issue of 'fit' is eliminated in the process and because the final rank list is determined strictly numerically with no further discussion, implicit bias may be minimized. However, the standard scoring system and interview questions must be rigidly adhered to and the practice of calls to colleagues with consistent questions of each may not be realistic.

Other factors such as institutional culture (diversity and mindset of faculty and staff, geographic location, encouragement/mentoring of URM students to apply for postgraduate training programs) and the traditionally low salaries offered to veterinary house officers also play a role in the applicant pool.[23] Individual programs could consider asking house officer applicants of interest to explain their GPA and factors that impacted grades such as learning new study habits, improving test taking skills, the need to work throughout their educational program or other relevant situations. Although higher GPA is correlated with performance during intern-ship year in human medicine and with success in future examinations, these metrics negatively correlated with faculty evaluations.[15,24]

Another dimension identified as predictive of success in resident training programs is emotional intelligence.[25,26] No peer-reviewed documentation exists for why veterinary medical residents fail in their programs. Failure to perform satisfactorily as a resident is seldom a function of intelligence of people in human medical residency programs; the vast majority of residents who underperform fail to succeed on the basis of motivational or interpersonal shortcomings.[25] Although not necessarily correlated with diversity, non-cognitive indicators of performance interview questions geared towards determining a candidate's emotional intelligence could provide additional insight into the potential for success in a rigorous training program.

While the work to broaden the racial and ethnic diversity of veterinary medical students in AVMA accredited schools and colleges continues, the simultaneous work of broadening the mindset of the faculty and staff to create a truly open and welcoming environment and improve mentoring of URM students must escalate. Also, the veterinary medical profession needs to grapple with gender, the over-representation of women in the field, and how to work towards a balance in gender along with a broadening of racial and ethnic and sexual and gender orientation representation. Ensuring equity within the profession continues to require close attention.

Recommendations

The following practices are recommended for all intern and resident selection committees.

1. Avoid selecting candidates based on their 'fit' with the program. Instead, use the same, consistent criteria to assess each candidate.
2. If using GPA as an assessment tool:

   a. Identify which courses contribute to GPA calculation and recognize that there is a lack of consistency between schools and colleges.

   b. Note whether the candidate had an improvement in their grades over the course of their professional degree program.
3. When considering class rank, recognize that this is a fraught metric because actual grades of the candidates may differ very slightly.
4. Look for participation in non-academic experiences such as team sports or theater or extensive musical talent as these can be indicators of professional success.

Using data gathered over time and in accordance with society's ever-expanding awareness of best practices, the AAVC will continue to assess and revise the VIRMP application process with the goal of allowing each candidate to effectively highlight their strengths and goals. Consistent with 2022 AVMA COE recommendations that are being made about DVM/VMD student training in the area of diversity training, the authors encourage each school and college of veterinary medicine to make an organizational commitment to incorporate diversity, equity and inclusion into its mission, vision and goals and to communicate the commitment frequently and widely. Leadership, both titled and untitled, must make this overt commitment visible and tangible. We support the continued compilation and assessment of diversity of the student body, faculty, house officers and the staff of each institution. Additionally, each institution must develop and nurture safe avenues for discussion of these important topics within all levels of the organization, along with support and provision of continuing education and professional development opportunities that foster inclusive behaviors, a deep understanding of the impact of bias within the organization, and the value of hiring and training individuals with diverse backgrounds and attributes. Each school and college must practice shared governance and a way for all stakeholders to have an opportunity to voice their perspectives during major decisions. DEI must always be a priority. In addition to an improved focus on diversity, equity and inclusiveness in student selection, the same considerations must be intentionally included during intern, resident, staff, and faculty recruitment. While the principles are the same, the benefits can be truly profound and determine an organization's success well into the future. It must be made clear throughout the organization that policies are explicitly in place to support DEI initiatives and strategies. Finally, financial compensation must be equitable and supportive of the individual's goals and wellbeing. Remember, these trainees are our future academic veterinary medical colleagues, collaborators, and leadership.

Acknowledgments

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