

# RETHINKING VETERINARY EDUCATION

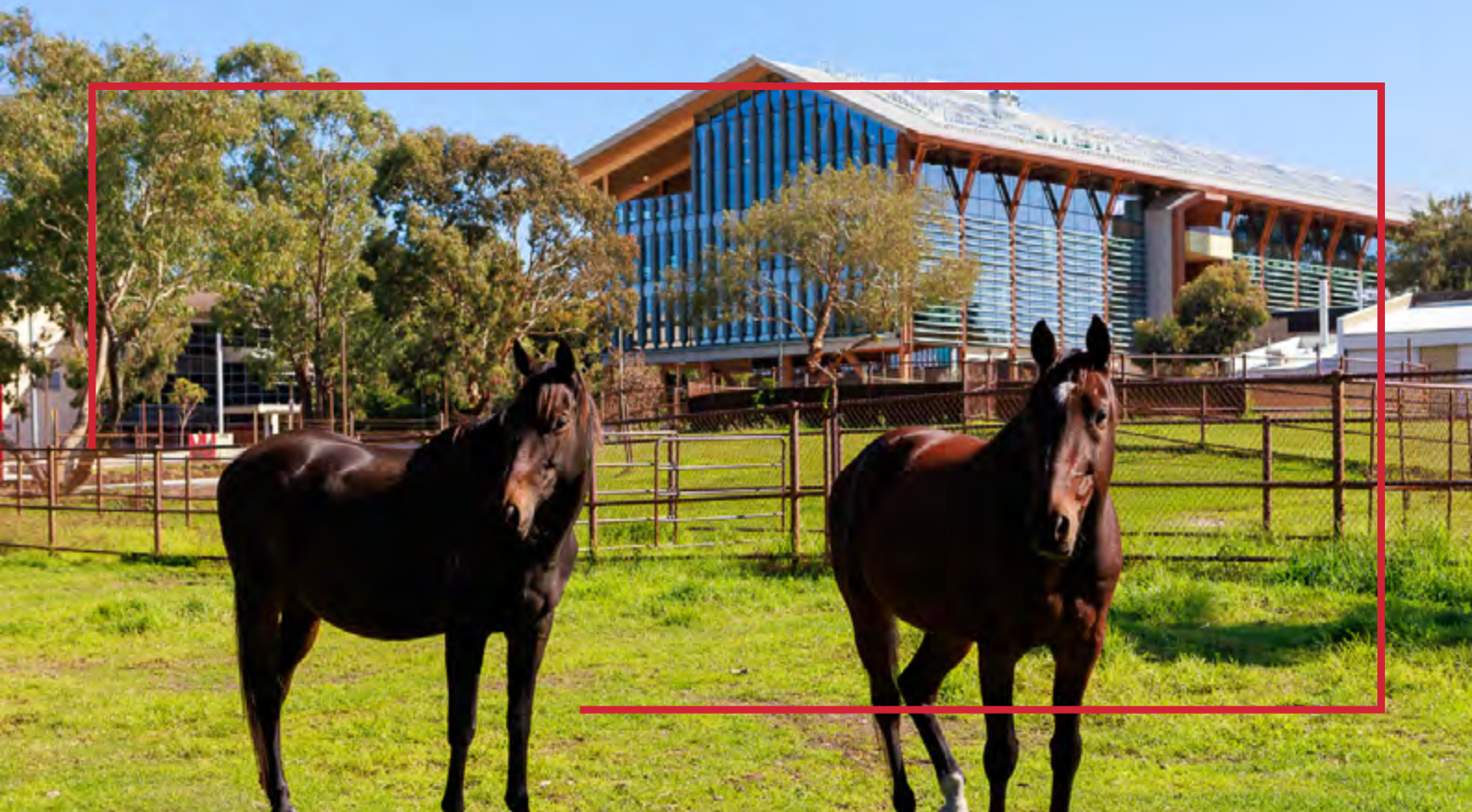


**VSANZ**

VETERINARY SCHOOLS OF  
AUSTRALIA AND NEW ZEALAND

Securing Australasia's future in biosecurity, food  
production, One Health and animal welfare



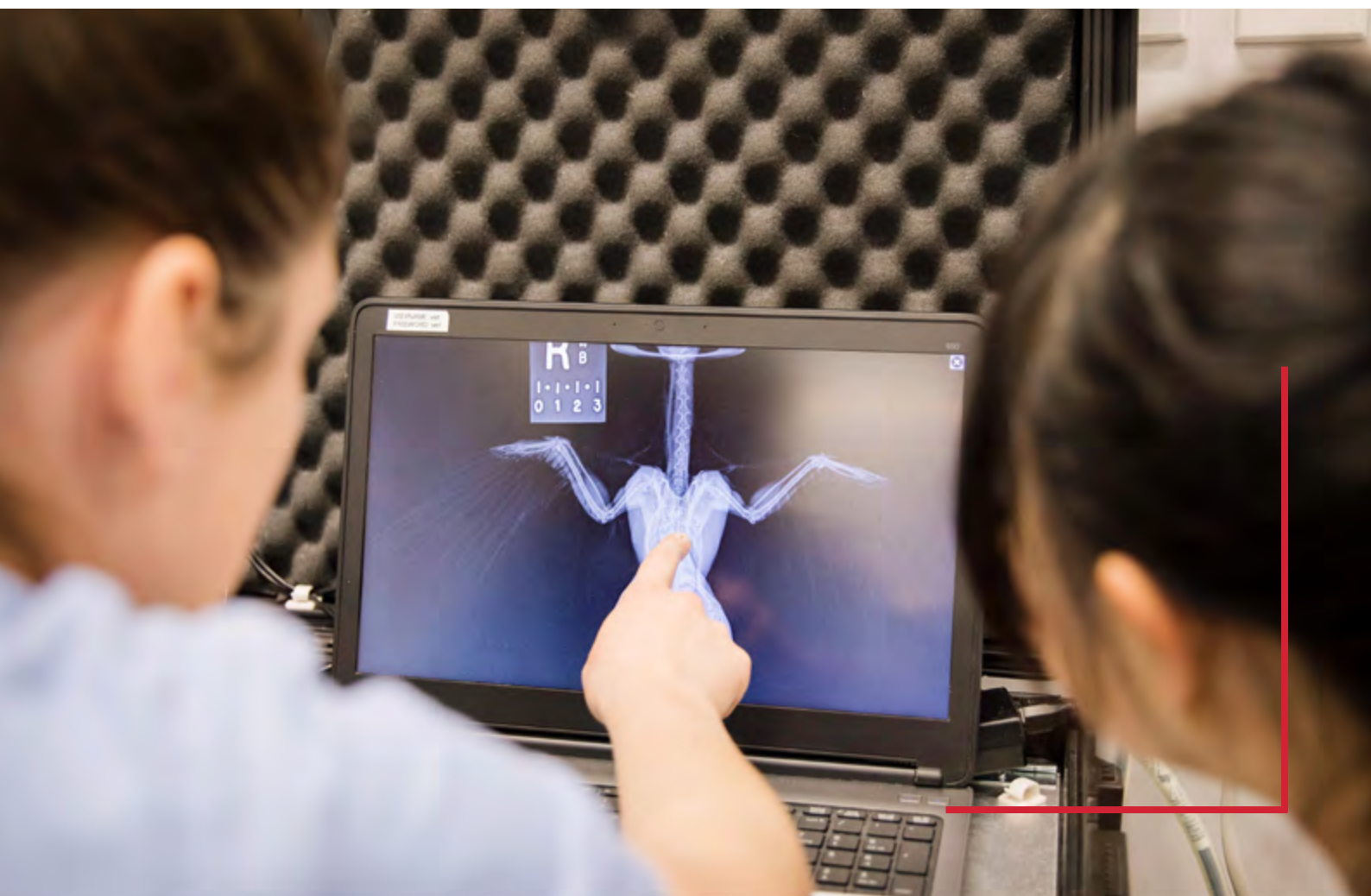


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# List of Acronyms

<b>AAVMC</b>	American Association of Veterinary Medical Colleges
<b>ABARES</b>	Australian Bureau of Agricultural and Resource Economics and Sciences
<b>ACIAR</b>	Australian Centre for International Agricultural Research
<b>ACVO</b>	Australian Chief Veterinary Officer
<b>AHA</b>	Animal Health Australia
<b>ANZCVS</b>	Australian and New Zealand College of Veterinary Scientists
<b>AQF</b>	Australian Qualifications Framework
<b>ATAR</b>	Australian Tertiary Admissions Ranking
<b>AVA</b>	Australian Veterinary Association
<b>AVBC</b>	Australasian Veterinary Boards Council
<b>AVMA</b>	American Veterinary Medical Association
<b>AVMA CoE</b>	American Veterinary Medical Association Council on Education
<b>AVR</b>	Australian Veterinary Reserve
<b>CGS</b>	Commonwealth Grant Scheme
<b>CPD</b>	Continuing Professional Development
<b>CSU</b>	Charles Sturt University
<b>CVE</b>	Continuing Veterinary Education
<b>DAFF</b>	Department of Agriculture, Fisheries and Forestry
<b>DV</b>	District Veterinarian
<b>EFTSL</b>	Equivalent Full-Time Student Load
<b>EFTS</b>	Equivalent Full-Time Student
<b>EU</b>	European Union
<b>FMD</b>	Foot and mouth disease
<b>HECS</b>	Higher Education Contribution Scheme
<b>ESOS Act</b>	<i>Education Services for Overseas Students Act 2000</i>
<b>HELP</b>	Higher Education Loans Program
<b>HESA</b>	<i>Higher Education Support Act 2003</i>
<b>HSC</b>	Higher School Certificate
<b>JVME</b>	Journal of Veterinary Medical Education
<b>MMI</b>	Multiple mini interviews
<b>NAVLE</b>	North American Veterinary Licensing Examination
<b>NSW</b>	New South Wales
<b>NZ</b>	New Zealand
<b>NZVA</b>	New Zealand Veterinary Association
<b>MPI</b>	Ministry of Primary Industries
<b>OIE</b>	Office Internationale des Epizooties (now WOAH)
<b>RCVS</b>	Royal College of Veterinary Surgeons
<b>RSPCA</b>	Royal Society for the Prevention of Cruelty to Animals
<b>TAFE</b>	Technical and Further Education
<b>TEQSA</b>	Tertiary Education Quality and Standards Agency
<b>UC Davis</b>	University of California, Davis
<b>UK</b>	United Kingdom
<b>USA</b>	United States of America
<b>VCNZ</b>	Veterinary Council of New Zealand
<b>VSAAC</b>	Veterinary Schools Accreditation Advisory Committee
<b>VSANZ</b>	Veterinary Schools of Australia and New Zealand
<b>VSBS</b>	Veterinary Surgeons Board
<b>WOAH</b>	World Organisation for Animal Health (formerly OIE)
<b>WTO</b>	World Trade Organisation



# Executive summary



## CHANGE IS NEEDED

The Australasian veterinary profession and its education system are approaching a crisis, with changing needs for vets in many increasingly complex areas and ever more pressure on universities to trim their costs and transform their teaching and research offerings. In addition, the supply and retention of new vets for large and small animal practices cannot keep up with increasingly varied and specialised demands from animal owners and employers.

Current approaches to veterinary science education, research and service delivery will not be sustainable nor allow delivery of Australasia's long-term needs for veterinary workforce renewal and enhanced research capability. The altered strategic context in which the profession now operates creates a strong case for change to the models of training veterinarians at universities and elsewhere. All stakeholders must contribute to positive change via their various mandates to ensure the past education model's strong outcomes are retained and built on.

## 1. CHANGING NEEDS FOR VETERINARIANS IN AUSTRALASIA

### 1.1 Farm animal and equine practice

Keeping horses and farm livestock healthy was critical for transport, food, and fibre production while the veterinary profession was developing in the early 20<sup>th</sup> century. Vets had to handle large animals and diagnose and deal with their health problems in the field, with few specialist facilities. These practical clinical skills are still required by any veterinarian in rural or mixed practice, both for effective practice and for animal and human safety, health, and welfare.

However, most farmers do not routinely engage vets, as many formerly severe health issues can now be prevented or managed by vaccines or better herd and flock management systems. Instead, agricultural suppliers can supply over-the-counter drugs or chemicals, and lay contractors can perform some routine procedures.

There are, however, increasing demands from larger producers for holistic farm advisory services and preventative animal health programs. These need an in-depth knowledge of farming systems and more analytical skills from large animal practitioners.

Due to high owner expectations, equine veterinary practice servicing the valuable horse racing and pleasure horse riding industries has become far more complex and specialised. As a result, only some new graduates can confidently enter pure equine practice immediately after graduation.

## 1.2 Government and industry veterinarians

Government veterinarians have been, and are, critical in assuring food safety and public health. For example, meat and milk inspection, hygiene, and on-farm animal health programs have protected people from major zoonotic diseases such as anthrax, tuberculosis, brucellosis, salmonellosis, and Q fever.

Better animal health and welfare is needed to produce animals and their products efficiently, safely, and humanely, with veterinary certification underpinning our multi-billion dollar per year export trade. After World War II, governments (and later industry) invested heavily in providing field and laboratory veterinary diagnostic services and research to support Australasia's valuable livestock industries. Fundamental and applied veterinary research helped produce many effective vaccines against serious infectious diseases of various livestock species and also many controls against internal and external parasites. Application of these findings enabled vets to advise farmers on managing these problems more efficiently, with tremendous economic, health, and welfare benefits.

Surveillance for proof of freedom from important diseases immensely helped ongoing trade. Moreover, success in keeping FMD and other exotic diseases at bay was extended to helping our Indo-Pacific neighbours better control and sometimes eradicate these diseases, with mutual benefits.

Challenges for the future are many!

- Biosecurity and transboundary disease prevention and management need further strengthening to support rural and national economies and ever-faster and higher-volume international trade and travel;
- Wildlife conservation and newer industries, such as aquaculture, need to understand and manage the health and welfare needs of unusual terrestrial and aquatic species; and
- Food safety and security, and One Health, Eco-Health, and Planetary Health programs increasingly require broader multi-disciplinary approaches with veterinary, medical, environmental, social, and other science inputs.

Experts forecast these needs to keep increasing in volume and complexity in future years, exacerbated by global and local demographic changes, the impingement of humans and their food production systems on native ecosystems, environmental pollution, and climate change.

## 1.3 Companion animal practice

Most new graduates start in companion or mixed animal practice, where they must now deal with heightened expectations and needs of owners for their pets' treatment, apart from the graduates' own desires to keep animals healthy and happy. Much of Australasia's highly urbanised population depends on pets for social support due to changing lifestyles and strengthening human-animal bonds.

Vets fill an essential role for many community members as their pets help stave off loneliness and depression and keep their owners mobile and more socially engaged for longer.

The many specialty services now offered for companion animal diagnosis and treatment and feelings of inadequacy can tempt new graduates into referring problems that previous generations of vets had to tackle locally. However, owners may not be able to afford these expensive options for different problems, with euthanasia seen as the only alternative. This can be extremely stressful for both the owners and their vets. Vets must be skilled at finding appropriate practical options where possible while managing owners' and often their own expectations and emotions. Therefore, there is a strong need for new graduates to have more practical skills in basic procedures while also being sensitive to owners' and employers' financial constraints.

## 1.4 The changing veterinary workforce

Veterinary practice structures have changed markedly in the last fifty years, from small practices with one or a few vets and few support staff and facilities, especially in rural areas, to a wide range of larger corporate entities, especially in cities, with more nurses and other support staff, and better hospital and diagnostic infrastructure; and a plethora of specialist, emergency, referral, or mobile practices.

Both New Zealand and Australia now undertake veterinary workforce surveys, although the Australian surveys are more recent and still need to cover most registered veterinarians. For example, Australia's 2021 survey showed that 80 per cent of respondents were primarily working in clinical practice, with less than 30 per cent of these in mixed, large animal or equine practice, approximately two-thirds in companion animal practice, and the rest in other fields including zoo/native animal facilities and commercial poultry. In New Zealand's 2019 survey, around 40 per cent of respondents were in mixed, dairy cattle, equine or large animal practice, while 38 per cent were in companion animal practice and ten per cent in regulatory work.

Survey results support the perception that veterinary practices, especially rural ones, need help recruiting and retaining staff. This was particularly true in Australia, where over three-quarters of veterinary practitioners responding had advertised vacancies within their practices in the previous 12 months, of which only 21 per cent were filled within three months, while 31 per cent of vacancies took more than 12 months to fill or were still unfilled. Around 75 per cent of New Zealand-trained veterinarians continued to register as practitioners ten years after their first registration. However, there were clear trends that their careers changed from rural practice to companion animal practice and from clinical practice to other non-clinical veterinary roles.

The average salaries of Australian veterinarians fall well below those of other professionals. When set against the length of the course and the high rate of student debt incurred, this may create disincentives for students to enrol in veterinary science and may be a factor in the low rate of male applicants.



## 2. REGULATORY FRAMEWORK FOR VETERINARIANS AND THEIR EDUCATION

### 2.1 Regulation of veterinary practice

Graduates from approved university veterinary schools are registered as veterinary practitioners by nine veterinary boards established under separate laws in all jurisdictions of Australia and New Zealand. The laws originally specified 'acts of veterinary science' to be done only by or under the supervision of veterinarians. Now most acts have been modernised to reflect community expectations of veterinary competence and conduct to standards needed to meet the public interest and national and international trade requirements and to provide public health protection.

The veterinary boards formed the Australasian Veterinary Boards Council (AVBC) in 1999 to accredit veterinary schools as producing graduates eligible for registration and to manage the registration of suitable overseas graduates.

### 2.2 Competency frameworks for new veterinary graduates

Veterinary schools should produce new veterinary graduates who have achieved 'Day One Competencies' – recently reviewed, with a series of 41 competencies within nine skills domains to be implemented from 2024 – in a framework closely harmonised with several international bodies in the UK, the USA, the EU and the World Organisation for Animal Health. This ensures that the profession meets contemporary standards, allows two-way international movement of veterinarians, and enhances Australasia's excellent global veterinary and biosecurity reputation, supporting trade.

The aim is to ensure that veterinary schools will produce generalist veterinary graduates with an appropriate foundation to practise safely and effectively in any branch of veterinary science, with scientific principle-based knowledge and skills, and with professional skills and attributes. In addition, graduates must further develop their knowledge and skills by continuing education throughout their working lives.

### 2.3 AVBC accreditation of veterinary schools

The AVBC maintains a set of accreditation standards against which schools are assessed by its Veterinary Schools Accreditation Advisory Committee (VSAAC). These detailed standards cover all aspects of the provision of a veterinary professional degree, from organisation and finances, through facilities and equipment, animal resources for pre-clinical and clinical teaching, information resources, student learning support, admission, progression, academic and support staff, curriculum, assessment, research programs and outcomes assessment.

VSAAC requires schools to show that they achieve these standards through a regular cycle of site visits to the school (at least once every seven years). Therefore, schools submit annual monitoring reports and notify them of any substantial program changes. Metrics assessed include staff-to-student ratios; numbers of animals by species; post-mortem opportunities available per student graduating; and the proportions of the course devoted to practical and clinical versus theoretical training. In addition to these input measures, there has been an increasing focus over the last decade on outcomes, e.g. measuring clinical competence outcomes, graduate and employer survey data and student satisfaction. However, progress in using outcome versus input measures could be faster.

The standards are onerous and expensive to achieve and can create tensions within universities about the financial sustainability of their veterinary schools. In addition, universities point out that the standards duplicate many internal and external quality assessment and compliance reporting processes, interfere with other university management processes, and impede innovation and flexibility within veterinary programs. Therefore, AVBC, VSAAC and universities should negotiate these issues to remove over-regulation and duplication from the accreditation process.

Conversely, the standards have prevented the erosion of critical attributes of veterinary education effectiveness, especially in training students in animal handling and management and in practical and clinical skills. These are critical foundations for safety and success in veterinary practice. However, standards or processes that spend public funds and student fees on teaching skills that undergraduate students have no intention of using in their careers and that create unaffordable and unnecessarily intensive programs of study do not serve anybody well.

**Recommendation 1:**  
AVBC and VSAAC (along with international regulatory partners where appropriate) work with veterinary schools to:

- Review the accreditation process to remove requirements that duplicate Australasian universities' many other accountability and quality assurance processes;
- Review the necessity and cost-effectiveness of each accreditation requirement in light of the desired learning outcomes; and
- Accelerate the transition from assessing teaching inputs to assessing learning outcomes as the principal basis for the accreditation of veterinary programs.



### 3. VETERINARY EDUCATION PROVISION AND FUNDING IN AUSTRALASIA

#### 3.1 Veterinary school development

As in the UK and Europe, veterinary education in Australasia evolved through the twentieth century, with five universities' veterinary schools delivering a five-year Bachelor of Veterinary Science course by the 1970s. A fundamental biological, animal and disease management science base was taught in the early 'pre-clinical' years, followed by a more clinical focus in the later years with clinical rotations across all common domestic animal species, large and small.

In the early 2000s, three more Australian universities opened veterinary schools. Four schools moved to a double degree course structure totalling six or seven years of study, with an initial bachelor's degree in biological/veterinary science and a second Doctorate of Veterinary Medicine (DVM) with more clinical / theory integration, similar to a US and European model. Further factors included the changing needs for veterinary graduates and the need to teach an explosion of relevant science.

The number of Australasian veterinary degree completions is projected to rise from less than 500 in 2008 to over 900 by 2025 (of whom around 20 per cent will be international students).

#### 3.2 Cost of veterinary courses

Veterinary Science courses are generally the most expensive to deliver of all university courses.

Universities have traditionally maintained herds/flocks of livestock for both veterinary and agricultural teaching and research and provided veterinary teaching hospitals for small and large animals. Students were and are also required to gain extra practical experience (at their own cost) by attending extramural placements in various animal establishments and with veterinary practices during their university holidays and during term time.

The high cost of veterinary science education is understandable when one compares the competency requirements for new veterinary graduates with those of other similar disciplines, such as Medicine and Dentistry. For example, medical graduates are not expected to be competent at graduation in many skills expected of new veterinarians, such as primary clinical diagnosis and treatment of disease, anaesthesia, dentistry, and surgery. Instead, medical trainees must complete two years of postgraduate residency in a public (government-funded) hospital before being eligible to practise as junior doctors. Many medical graduates also undergo further specialist training in their chosen areas of specialisation.

The Commonwealth, State and Territory governments share the salary and other costs of providing medical student internships. These governments also make substantial financial and in-kind contributions to the costs of pre-registration training of dentists through public dental clinics. Most significantly, trainee doctors and dentists deal only with one animal species, whose restraint and management during diagnosis and treatment is not problematic in most cases; hence less practical training is needed.

Opportunities and strategies to address the joint pressures of increasing and changing needs for veterinarians and managing their education costs are discussed in detail below.



## 4. THE CHANGING PATH FROM UNIVERSITY TO THE WORKFORCE

### 4.1 Admissions to veterinary courses

Admissions to professional veterinary courses set the future make-up of the profession since the failure rate across the course is extremely low. The great majority of applicants come from urban backgrounds, mirroring the >86 per cent urbanisation of the Australasian population, and around 80 per cent are now female. The selection at some universities is primarily on academic merit. In contrast, at others, a lower tertiary entrance ranking cut-off is accompanied by an interview process or aptitude/ situational judgement testing to select for other 'soft skills', animal experience, or problem-solving attributes. Some employers consider that graduates selected by these more complex processes may perform better and remain longer in practice than those from purely academic streams. Some rural practitioners would like more male applicants admitted or more students from rural areas, arguing that they would be more likely to enter and stay in rural practice.

Across the eight veterinary schools, around 25 per cent of students enrolled in 2020 in any year of a veterinary course were from overseas. However, the total number of domestic and international students admitted by each school may need consideration in light of national demands and the veterinary school's capacity to deliver.

Equity and diversity are also considerations. For example, in New Zealand, where Māori and Pasifika are markedly under-represented in the veterinary profession, a new pathway (VetMAP) has been introduced to enhance the selection and retention of students with Māori and Pasifika heritage. In Australia, an Indigenous, Regional and Low SES Attainment Fund combines funding from existing programs to ensure that Indigenous students and students from low socioeconomic and regional backgrounds have more opportunities to attend university and are better supported whilst there.

**Recommendation 2:**  
Veterinary schools widen their mainstream admissions process to select students on a broader range of excellence, equity and diversity than solely academic achievement and collaborate on admissions research to evaluate new approaches.

There is significant concern about maintaining a viable workforce of rural practitioners able to protect the livestock industries and national biosecurity and food safety priorities. For veterinary schools to play their part in producing enough graduates with solid competencies and interests in farm animal practice and biosecurity to support these critical industries, it may be necessary for some, if not all, veterinary schools to admit students with a commitment to rural practice into a rural or a combined rural/government veterinary practice track.

Setting the number of students in this stream in proportion to the number of rural practitioners in the profession may ensure sufficient future capability while tailoring some of the most expensive parts of the veterinary course more closely to the demonstrable needs of each country.

**Recommendation 3:**  
Veterinary schools consider supplementing the mainstream admission process with an additional entry pathway targeting applicants committed to rural or government veterinary practice, subject to demand.

Australian veterinary schools would be assisted in their admissions and education decisions by access to more comprehensive and timely information on veterinary workforce trends, as is available in NZ. AVBC is exploring establishing a universal registration database in Australia that could underpin a regular workforce survey. This would provide objective evidence on veterinary workforce trends and help veterinary schools assess the adequacy of admissions and education processes.

**Recommendation 4:**  
AVBC establish a universal veterinary registration database in Australia and work with the AVA to undertake an annual workforce survey.



## 4.2 Changing how veterinary curricula are structured

Many curricular models exist to deliver outcomes and competencies to be achieved by each graduating student. The balance between theoretical and practical training for different subjects and their delivery throughout the course(s) by systems models, spiral models progressing from normal to abnormal, or different integrating tools must be regularly assessed.

These curricula are under ever-expanding pressure due to the rapid growth of veterinary science knowledge and expertise across widening and more complex multi-disciplinary fields. For example, the number of veterinary research/scholarly outputs recorded yearly in the Scopus database trebled from 1996 to around 26,000 in 2020. This new knowledge requires incorporation into already crowded undergraduate curricula or postgraduate programs.

Fundamental education in scientific principles underlying different subjects is critical to graduates' later ability to extrapolate from core teaching to deal with novel species or situations and move into different career paths. Newer scientific and veterinary areas such as animal welfare and animal behaviour; wildlife biology and management; aquaculture and other novel animal production systems; One Health and zoonosis risk management; and impacts of climate change and environmental pollution on animal, human and ecosystem health and welfare; may be inadequately covered. Meanwhile, other traditional but changing subjects such as parasitology; livestock disease management; and biosecurity, including surveillance, reporting and key government biosecurity programs; may be at risk of being 'squeezed out' to some extent. To make space for their favoured areas, some submitters suggested removing other content they believed to be less important. A few suggested extending the length of veterinary courses by one year to allow for more in-depth teaching of different areas. However, longer training periods markedly increase the costs of veterinary courses.

### Recommendation 5:

**The core of veterinary curricula remains based on a broad but integrated body of knowledge, principles and skills that equip students with the potential to transition between different career paths within the veterinary profession.**

Veterinary education research over the last 10-20 years has evaluated many changes that have been implemented in modern veterinary curricula, confirming the importance of interventions such as:

- Embedding communication skills training within curricula;
- Increased clinical skills teaching and assessment, supported by well-resourced clinical skills laboratories;
- Increasing emphasis on the vet as a professional and the importance of professional identity formation;

- Technological advances in teaching methods – e.g. use of body cams, video resources, and virtual slides;
- Greater use of problem-based learning and case-based learning;
- Increasing emphasis on the concepts of One Health, global health and sustainability; and
- Support through decisive transition periods – into, through and out of the curriculum, including support and curriculum interventions concerning mental health and general well-being.

### Recommendation 6:

**Veterinary schools continue to engage in collaborative educational research nationally and internationally.**

## 4.3 Well-being of veterinary students and new graduates

The wide-ranging concerns about pressures on students and new graduates and mental health issues observed among them may partly reflect reports of increasing mental health issues in Australasia, especially among young people, young women, and rural communities – a similar demographic to veterinarians. Australian vets have grappled with mental health issues for years – in 2021, their suicide rate was four times higher than the general population. A focus on positive psychology interventions and self-care (supported by appropriately qualified professionals) may assist this.

### Recommendation 7:

**Veterinary schools continue to create space in the curriculum for professional skills development and conversations on well-being and self-care. Interventions should be evaluated, and results shared across the veterinary education community and the wider profession.**

## 4.4 Tracking within the undergraduate curriculum

The highest costs of courses are due to the need for practical and clinical training in both large and small animals to produce 'omnicompetent' veterinary graduates. 'Tracking' allows increased student choice within the curriculum so students can decide what area(s) of the profession they wish to focus on earlier. Some degree of undergraduate tracking or 'career emphasis' is already developing in the US, UK, EU, Australia and NZ.

Many submissions supported this, but not to the extent that it would lead to limited licensure of veterinary graduates after training them only in one field of veterinary science. It was felt that limited licensure would be too cumbersome and expensive for regulators and graduates and inhibit graduates' flexibility in changing career paths over time. It may also disadvantage rural and mixed practices from being able to hire and retain staff and manage after-hours service, especially smaller practices. However, the number of solo practices is declining, and mixed animal practices are increasingly relying on veterinary teams made up of veterinarians with specific areas of expertise rather than on 'all-rounders'.

Some submitters felt tracking could interfere with the national ability to deal with major emergencies and exotic disease responses. However, the opposite is probably true as the success of future exotic disease responses relies on an adequate number of well-trained veterinarians in government and rural practice (supported by veterinary researchers and rural support staff) more than on small animal practitioners for whom large animal training is a distant memory.

Expected benefits of increased tracking include:

- Reduced pressure on veterinary curricula by not having to teach 'all things to all students' with flow-on benefits to student and academic staff well-being;
- Higher competence in the chosen areas of career emphasis giving a shorter period to proficiency (i.e. being able to work unsupervised to the standards required promptly);
- Benefits to self-confidence arising from a higher degree of competency and the likelihood of fewer poor clinical outcomes and 'negative client experiences' that contribute to retention issues;
- Earlier attainment of proficiency, thereby improving employers' capacity to pay the higher salaries required by new graduates to manage their student debt;
- Reducing the challenge and wasted investment of trying to get students to engage in practical sessions in subjects that they have no interest in – this impacts academic staff (especially practitioners involved in outsourced teaching) but also fellow students; and
- Reducing costs of providing enough practical/clinical supervision for all students across all areas.

**Recommendation 8:**  
**Veterinary schools progressively expand the proportion of the curriculum devoted to 'tracking' to produce new graduates with higher proficiency levels (including technical skills) in their chosen early-career paths.**

The AVBC does not intend its new competencies for 2024 onwards to be applied across all animal species. Instead, differential levels of expertise are anticipated, with graduates recognising which species will be most relevant to their intended career path and aligning skills development accordingly.

Core domestic species serve as the foundation for skills demonstration, with extrapolation to other species applied as indicated. This will facilitate more flexible curricular models where tracking is introduced earlier, with all students trained to bare competence in all key species and selecting species or areas where they can pursue higher clinical expertise before graduation. All graduates will be expected to undertake continued professional development or further postgraduate education in selected species or fields to allow for increased specialisation.

**Recommendation 9:**  
**AVBC / VSAAC continue to review the extent to which the accreditation standards permit increased tracking.**

#### 4.5 Outsourcing (or 'distributed') clinical teaching

The high cost of clinical teaching and the difficulty of maintaining adequate staffing and caseload in all veterinary fields have led to varying degrees of outsourcing to the private sector and other universities. Fully or near-fully distributed or outsourced clinical teaching models rely on contracting veterinary practices to take students for most clinical rotations rather than maintaining university teaching hospitals. They require careful relationship management with the contracted practices and accreditation authorities. Unless the full costs of outsourced teaching are met, they can shift unmet costs to the profession. They are used widely in the USA and UK but may be harder to introduce in some parts of Australia for geographic and demographic reasons.

There are genuine challenges in reconciling service revenue-oriented private entities with the demands of a mission-driven teaching entity. For example, while there was support for outsourcing some clinical teaching to provide students with deeper and broader modern-day veterinary practice experience or to allow smaller numbers of students to acquire higher expertise in their electives, submitters were less supportive of a fully distributed model. Students should take the first hesitant steps into clinical practice in a teaching-focused rather than a client-focused environment.

Busy practitioners found it difficult to balance their clients' responsibilities with those of their students. However, students with good animal handling experience, client communication skills and a professional manner were easier to manage in a private practice setting. In addition, some international students posed language and cultural challenges, and some practitioners needed to be more enthusiastic about teaching students who might not practise in Australasia.



Both domestic and international students were concerned at the personal and financial costs of being sent all around the state or country for their training – disruptive to their personal relationships, accommodation arrangements, and part-time employment opportunities, with burdensome extra travel and living costs at off-campus locations on top of already high costs of study.

In some cases, central or state governments could provide direct funding to practices for high-quality outsourced clinical (and pathology) teaching experiences in national or state priority areas. Importantly, this allows governments to influence graduate destinations and meet other government priorities directly. For example, supporting the viability of rural veterinary practices through providing teaching revenue could help ensure the preservation of biosecurity and animal welfare services in rural communities. In addition, this approach successfully supports medical, dental and health care in rural Australia (the Rural Health Multi-disciplinary Training Program).

Veterinary ‘apprenticeships’ may be an alternative supplement to traditional on-campus veterinary education. Apprenticeship training models previously played an important role in the professions, with a senior mentor imparting skills and knowledge to their trainee. In modern professional apprenticeship models, students undertake supervised employment in a practice setting with the theoretical aspects of their education gained by self-directed learning and participating in coursework delivered flexibly by the degree-granting institution. For example, ‘Medical Doctor Degree Partnerships’ will soon be offered in the UK, providing the opportunity to grow the future medical workforce while broadening diversity. Apprenticeships also reduce the opportunity costs of study because the students are employed throughout their education and meet some of their educational costs.

**Recommendation 10:**  
Veterinary professional associations and schools explore veterinary apprenticeship models relevant to Australasia and the cost-sharing options that facilitate them.

#### 4.6 The research/teaching nexus – changing labour models

Research-enriched teaching has defined university-level learning since the early 19th century and is enshrined in law in several countries, including NZ and Australia. University veterinary research programs ensure students benefit from cutting-edge, evidence-based knowledge taught by inspiring research-active staff, who are often recruited to Australasian veterinary schools motivated by the opportunity to have far-reaching impacts on animal health and welfare, public health and societal prosperity. Students must also complete at least one research project during their course, giving them essential experience in critical thinking and analysis and teaching them how to find and evaluate information.

However, the traditional research-led teaching model, of 40 per cent teaching, 40 per cent research, and 20 per cent service and administration, is under great pressure due to its cost (research-active academic staff usually have only the marginal costs of their research funded, while most labour and indirect costs must be cross-subsidised from teaching revenue) and to increasing pressure on staff from competing demands of research, and their other duties. In addition, staff must now devote significantly more time to student well-being issues and highly individualised teaching and student advising by combining online delivery methods, emails and social media.

For these and other reasons, most veterinary schools are incorporating a more diverse set of career pathways into their programs, including teaching-focussed, clinically-focussed and research-focussed roles to complement the traditional combined research and teaching academic role. These newer career paths can be more cost-effective but require considerable leadership and management expertise to meld into unified teaching, research and clinical teams that expertly deliver the diverse outcomes expected of world-class veterinary schools. They also need improved university-wide human resource processes, such as clearly defined promotion criteria for different career paths.

**Recommendation 11:**  
Veterinary schools continue incorporating more diverse career pathways into their structures.

Some submitters noted a global and Australasian academic teaching and research veterinarians shortage. Submissions from the profession were strongly in favour of practising veterinarians (including general practitioners, specialists, and government veterinarians) in part-time teaching roles, considering that this would assist with curriculum relevance and inspire veterinary students to consider other career pathways (such as government veterinary work). The review also highlighted a desire from a number of contributors for greater collaboration from across the profession in curriculum design.

Veterinary courses must balance the employment readiness of new graduates with the knowledge and skills underpinning career-long employability. Teaching by practising professionals, both specialist-level and general practitioners, can provide relevance to modern practice. Outsourcing clinical teaching is another way the profession contributes to curriculum delivery, as is participation in the normal processes veterinary schools undertake to hone the desired learning outcomes they design curricula to achieve.

**Recommendation 12:**  
Veterinary schools continue to explore further opportunities for explicit constructive and effective collaboration with the wider profession concerning the curriculum and transition to the profession.

## 5. STRATEGIC STRUCTURAL REFORM FOR FINANCIAL SUSTAINABILITY

### 5.1 Higher education funding changes

Higher education in Australia has moved in the last twenty-five years from relying almost entirely on Commonwealth government funds to supplementing these with a mix of domestic student fees (typically covered by income-contingent loans), international full fee-paying students, and other sources such as research and other service contracts, intellectual property and philanthropy. Similar trends have occurred in NZ.

In Australia, the proportion of total income across all universities provided by the Commonwealth government declined to around 25 per cent in the decade before the pandemic. At the same time, international student fees increased to over a third of universities' total income. However, this revenue diversification was accompanied by unrelenting pressure on university cost-effectiveness, aiming to deliver equal or better outcomes for less and to ensure the universities live within their means. This financial pressure was exacerbated tremendously by the COVID-19 pandemic and its 2020-22 border closures, which severely reduced international student numbers, required rapid expansion of online delivery, and reduced reliance on face-to-face teaching and 'hands-on' skills-based learning.

### 5.2 Funding shortfall for veterinary students

Veterinary education has been particularly hard-hit by budget pressures. For most Australasian veterinary schools, there remains a substantial gap between the total funding received for each domestic veterinary student and the cost of educating them. Australian veterinary science students are in the highest Commonwealth Grant Scheme (CGS) funding cluster with Agriculture, Medicine, Dentistry and Pathology. Domestic veterinary student fees are also in the second highest student contribution band (\$11,800 p.a. for Commonwealth-supported students commencing in 2023). Despite this, the funding per veterinary student to universities from government grants and domestic student fees covers only around two-thirds of the average estimated total delivery cost per student.

Australasian veterinary schools have for many years been actively considering and implementing various structural reforms to improve their financial stability in the face of increasing budget pressures while, at the same time, protecting staff and student well-being and enhancing their teaching and research programs to deliver graduates who meet the many expectations of the community and themselves.

However, there was a strong consensus amongst the heads of schools that things cannot continue as they are and that the opportunities for incremental change are now largely exhausted. Put simply, the schools are at a tipping point.

### 5.3 Responding to university-wide strategies to manage cost pressures

#### Universal budget cuts

Universities manage cost pressures by imposing budget restrictions on all faculties/colleges/schools to align their revenue and expenditure more closely. However, as noted above, it is well-nigh impossible for veterinary schools to bring their costs down sufficiently to live within their total funding per student. As a result, veterinary schools struggle to meet the direct costs of their teaching and research activities (e.g. staff salaries, contracted services and consumables), fall short of expected contributions to university-wide shared costs (e.g. libraries, IT services, and facilities management), and have difficulty retaining and replacing staff, maintaining clinical services and undertaking capital developments. This requires cross-subsidisation from other parts of the university and is not sustainable in the long term, creating inter-faculty resentment and reluctance to approve investment in new positions, facilities, and innovations in faculties and schools perceived to be a drag on the university.

#### Merging academic groups

Stakeholders sometimes perceive veterinary faculty mergers with other faculties as a loss of autonomy and identity. However, they aim to streamline and save on administrative rather than teaching costs. With a sketchy academic or public good rationale, priorities for veterinary teaching have sometimes been subsumed, and delivery modes weakened as a result, as shown by post-merger cost-saving decisions to cease offering the internationally renowned Masters of Veterinary Public Health course at the University of Sydney in 2019, and more recently the closure in 2022 of the iconic Werribee Veterinary Teaching Hospital at the University of Melbourne.

While mergers achieve benefits of scale and facilitate multi-disciplinary teaching and research, the disciplines included in a merged entity are pivotal to the future direction of a veterinary program. Merging a veterinary faculty with a biomedical-orientated faculty produces very different opportunities to a merger with an agriculture or science faculty. Should larger faculty mergers continue in Australasian universities, the profession's future contribution in critical areas such as 'One Health' will be better secured if at least some of these mergers include biomedical science disciplines.



## 5.4 Changing educational delivery modes

In recent years, Australasian universities have significantly enhanced their ability to deliver online education and student services. Veterinary schools can now offer courses to various off-campus students – time-poor adult learners and students from offshore or far-flung rural communities. This opens opportunities in undergraduate, postgraduate and international education and continuing professional development. It also helps schools develop resilience in the face of disasters, build scale, share resources and outsource some teaching. Undergraduate education opportunities include digital enrichment of face-to-face learning experiences and possible facilitation of professional apprenticeships, where students are employed during their training while supported by distance education. Cost-sharing prospects include building scale in specialised courses and programs and sharing specialised staff between schools, including hard-to-recruit clinical specialists. However, the high costs of developing and delivering quality digital programs are often underestimated.

Importantly, online delivery must be carefully balanced with collaborative and in-person activities to ensure that the benefits of social interaction and the development of essential communication, collaboration and team-working skills are not compromised. Practical and clinical skills must still be taught, and most veterinary research and clinical teaching must be delivered physically.

## 5.5 Building scale

Building scale can increase the number of graduates entering the profession and the number of research-active staff advancing knowledge and creating a virtuous cycle in the school's ability to attract top staff, highly able students, high-end philanthropy, and collaborations with highly ranked institutions.

Scale can be increased by enrolling greater numbers of domestic and/or international veterinary students; by transferring parts or all veterinary programs from one university to another; by diversification (e.g., expanding for-credit and not-for-credit postgraduate education); or by teaching related programs such as animal science, biomedical science, and veterinary nursing. This can increase facility utilisation and efficiency, reduce the cost per graduate, and improve earnings, providing the school (and its university) more resilience and financial flexibility in the face of downturns.

Universities may use improved earnings by reducing internal cross-subsidisation or by re-investing them in enhancing the quality or accessibility of veterinary education or research. Increasing scale also increases the number of graduates entering the profession and the number of research-active academic staff employed to advance knowledge. More research at a scale provides undeniable benefits to future generations, leads to improved research quality and relevance, and builds the school's international reputation.

However, the capacity of veterinary schools to provide enough facilities, animal resources, clinical caseloads and staff for teaching delivery and assessment, for either in-house or outsourced practical and clinical training, can be a major limitation on how much this strategy can be deployed. Building scale may become economically and practically unviable without proper resourcing, especially sufficient staff, and changed accreditation requirements.

## 5.6 Resource sharing between veterinary schools

Resource sharing aims to reduce the costs of individual schools by apportioning them across several entities, improving resource utilisation and financial sustainability. This may occur with other schools/programs within the same university; other veterinary schools; and organisations with overlapping interests with veterinary schools (e.g., veterinary practices, clinical pathology companies, research organisations, government departments and private training providers).

Resource sharing is usually beneficial to research as it widens access to high-cost, specialised physical facilities (such as infectious disease containment laboratories) and expensive equipment. Higher usage rates also improve the prospect of replacing specialised facilities and equipment when needed because both the non-financial and financial elements of the business cases are enhanced.

Sharing services between veterinary schools is likely to benefit most from veterinary-specific services (e.g., specialised clinical services, clinical facilities, clinical pathology facilities, research facilities, library resources, and specialised courses of study). However, the wide geographic spread of Australasian veterinary schools may increase costs borne by students, staff and schools.

## 5.7 Strategic change fund

Many opportunities for structural reform to enhance the financial sustainability of Australasian veterinary schools are already fully or partially implemented in some ways. However, they have different strengths and weaknesses regarding teaching and research quality, relevance and impact, and will have different applications at each school.

**Recommendation 13:**  
Each veterinary school considers the 'fit' of structural reform opportunities identified in this report with their strategic context and operating environment.

A search for productive and possibly transformative synergies is best carried out collaboratively between all Australasian veterinary schools. Strategies and opportunities for developing tracking options and managing the cost pressures of providing effective core and elective clinical training should be identified and explored with relevant stakeholders. This will require the establishment of a collaborative strategic change fund to unlock effective veterinary school resource-sharing models.

**Recommendation 14:**  
All eight universities with veterinary schools jointly contribute to a shared strategic-change fund to unlock effective veterinary school resource-sharing models.





## 6. INCREASING GOVERNMENT SUPPORT FOR VETERINARY EDUCATION

### 6.1 Threats to nationally critical veterinary education capacity

Because most veterinary schools in Australasia rely on cross-subsidisation at the expense of other faculties, their viability depends on institutional patronage. To a greater or lesser extent, they experience on-campus resentment and a reluctance to invest in the school. At least one veterinary school is in a comparatively precarious position given the reduced ability of the university to continue cross-subsidisation since the COVID-19 pandemic, with a real prospect that the school may be closed.

The ongoing willingness of universities to cross-subsidise veterinary schools cannot be taken for granted. A fundamental duty of university leaders is to protect the sustainability of their university for future generations. Cross-subsidisation of veterinary schools will continue only to the degree financial resources allow and only if the veterinary school contributes more to the university and wider society than other areas of study that would benefit from additional financial support.

### 6.2 Increasing government grants to universities per veterinary student

As noted above, Australian veterinary courses remain the most expensive to deliver, with the average cost per Equivalent Full Time Student Load (EFTSL) of the total government plus domestic student fee (cost-to-funding ratio) remaining stubbornly at around 150 per cent of the overall average for all fields of study. This requires cross-subsidisation from other parts of the university and is not sustainable in the long term. Universities and their veterinary schools have deployed numerous cost-cutting and efficiency strategies over the last decade without changing this fundamental imbalance. Paradoxically, scaling up the numbers of students in professional courses causes university losses to mount. It, therefore, makes it difficult to satisfy emerging workforce needs and challenges new graduates' practical and coping skills.

Since 2021, Commonwealth Grant Scheme (CGS) funding for domestic students has been arranged in four Commonwealth contribution clusters and student contribution bands, with Veterinary Science in the highest Commonwealth cluster with Agriculture, Medicine, Dentistry and Pathology. For students commencing in 2023, this cluster receives a standard annual CGS payment of \$28,196 per EFTSL. Veterinary domestic students also contribute to the second highest level of \$11,800 p.a., with most students utilising the income-contingent HECS-HELP scheme to cover these amounts. However, the net funding amount per student place still needs to be improved, with the cost per EFTSL of the total government plus student

fee (cost-to-funding ratio) being 148 per cent in 2018, an underpayment rate that had been observed in previous studies. The decrease of this ratio to 135 per cent in 2019-20 can be attributed to pandemic-related under-expenditure, which should be temporary.

Even if all the structural reform opportunities discussed above are implemented, Veterinary Science education will remain significantly more expensive than Medicine and Dentistry.

It will therefore be necessary to increase the funding rate per veterinary EFTSL without disadvantaging other courses and for universities to prioritise this extra funding specifically to support Veterinary Science programs (e.g. for the operation of veterinary teaching hospitals).

**Recommendation 15:**  
The Australian Government move quickly to increase the funding rate per veterinary EFTSL by at least 30 per cent – and, where relevant, lift the maximum basic grant funding of universities to accommodate this increase in revenue. The NZ Government should similarly adjust its grant funding for veterinary EFTS.

### 6.3 Providing a veterinary clinical loading

The high cost of training medical students is recognised by the Australian Government's provision of an extra 'medical student loading' for a designated number of medical students rather than using the demand-driven model for other fields of study. Universities are paid this loading for clinical training. (The postgraduate two-year medical residency also incurs a salary cost shared between Commonwealth and States.) An alternative or supplementary measure to manage the high costs of veterinary clinical training may be for governments to designate a specific number of veterinary science places and provide loading for them similar to that applied to medical students. This could target students' large animal clinical training and/or other clinical teaching placements to address equity or diversity issues.

**Recommendation 16:**  
Governments consider providing a clinical training loading for a designated number of veterinary students' clinical training in priority areas.

#### 6.4 International veterinary students

Given the important financial and non-financial contributions made by international veterinary students to Australasia (including helping cover funding shortfalls for veterinary teaching and research, bringing awareness of international animal health issues to the classroom, the establishment of collegial cross-cultural networks that underpin future business and trading relationships) and the significance of recruiting international veterinarians into the private and government workforce, it is important to create favourable immigration settings and internationally competitive in-study and post-study rights.

**Recommendation 17:**  
Both Australian and NZ Governments continue facilitating international veterinary student access via favourable immigration settings, competitive in-study and post-study work rights, and a clear pathway to residency.





## 7. TRANSITION TO THE WORKFORCE

### 7.1 A profession-wide approach to well-being and healthy work practices

The challenges of transitioning to a fulfilling career and managing mental health risks of veterinary practice are well recognised globally and by veterinary students. A recent Australasian study and review submissions identified common stressors as adverse work conditions, including extreme tiredness from after-hours work, challenging client relationships, and adverse events and patient outcomes. Some may relate directly or indirectly to education (e.g. level of competence and sense of fit, experience of failure). Conversely, the most cited protective factors were fulfilment and satisfaction, positive work conditions, and supportive colleague relationships. In a NZ study, recent graduates had better experiences of early career support than those who had graduated 20 years ago.

Graduates need personal resilience and professional commitment to handle the challenges of interfacing with the general public while delivering appropriate care to their animals. Lack of confidence greatly contributes to high stress levels and early burnout.

Employers need to provide high levels of support to new graduates, to meet client and employee expectations in increasingly busy practices. Some feel that graduates should be taught how to survive rather than thrive in veterinary practice.

Employers seek graduates with the following:

- Higher levels of proficiency in the common practical skills of their chosen field of practice science;
- Problem-solving skills and information literacy;
- Understanding of vet practice realities, including financial constraints on clients and practices; and
- Communication, management, teamwork, and life coping skills – flexibility, tenacity and resilience.

A recent survey by Professionals Australia identified key measures that would improve the veterinary industry: increased pay and remuneration; improved pet insurance schemes to improve the business model; improved client education; better workplace mental health support; better support for veterinarians in rural areas; and assistance with veterinary education costs.

Veterinary professional associations have an important role in assisting employers in managing workplace issues affecting recruitment, retention, and well-being and in developing their members' business/management experience to help hone veterinary business models.

#### **Recommendation 18:**

**Veterinary professional associations assist employers in taking charge of the workplace issues that affect recruitment, retention, and well-being and in developing their members' business and management experience to help hone veterinary business models.**

### 7.2 Mentoring of new graduates

Mentoring new graduates is essential to smooth their passage into the workforce. VSAAC recognises that 'new graduates' level of competence is at a level where continued veterinary supervision, support, coaching and mentoring and continuing professional development are required to develop proficiency, ease and confidence required for full independence'.

In Australasia, some larger corporate and specialist practices and institutional employers run their self-funded internship programs, with internal mentoring, for months or years. In contrast, many (but not all) smaller practice employers provide informal mentoring support. Although medical graduates require a formal internship program, having a mandatory one for veterinary graduates is not considered practical, owing to the large variety of workplaces and the financial implications, particularly for smaller practices.

The UK has recently introduced a mandatory Veterinary Graduate Development Program (VETGDP) for new graduates, overseas vets, or those returning to practice after a break of five or more years.

Both AVA and NZVA have developed voluntary mentoring programs for new graduates, which are well-received. These should be widened while acknowledging there will be financial and time impacts for employers of heightened supervision resources. Veterinary boards should move to strengthen their oversight, including possible adoption of the 'light touch' the Veterinary Council of New Zealand (VCNZ) regulatory approach and potential legislative changes.

#### **Recommendation 19:**

**Australasian veterinary boards, the AVBC, NZVA, and AVA work together to harmonise their graduate mentoring programs and consider making them mandatory.**



### 7.3 Government-supported rural veterinary practice networks

The viability of many rural veterinary practices is under threat, making it difficult to maintain adequate biosecurity measures and exotic disease response preparedness. New Zealand is developing a Veterinary Network for Biosecurity Preparedness and Response (VetNet Biosecurity+) to address this problem.

An Australian Senate review into the adequacy of Australia's biosecurity measures and response preparedness recommended that the Australian government should work with relevant industry bodies to design and implement measures to improve the capacity and capability of production animal veterinarians, particularly in rural and remote areas, including enhancement of veterinarian attraction and retention strategies and initiatives such as graduate and rural practice incentives; compensation paid to veterinarians in the event of their involvement in an EAD response; and increased utilisation of rural and remote veterinarians in surveillance and monitoring activities.

These measures will need considerable customisation by state and territory governments due to different private and public models of rural and remote veterinary services in different parts of Australia. Animal Health Australia, with Commonwealth, state / territory governments and livestock industry peak bodies, would be well placed to help with this endeavour, and veterinary schools also need to explore their complementary roles.

#### **Recommendation 20:**

**Veterinary schools collaborate with Animal Health Australia and governments in Australia and New Zealand to explore and develop their role in upskilling veterinarians for biosecurity and emergency disease preparedness.**

In keeping with the Senate's recommendation, the Panel recommends that the Australian government consider directly contracting a network of leading rural veterinary practices – in part to support the nation's biosecurity preparedness – and in part to teach livestock clinical practice and government veterinary services on behalf of and in collaboration with veterinary schools. As well as improving the viability of rural practices, this approach could significantly augment the rural teaching capacity and relevance of university-based veterinary teaching hospitals, supporting rural veterinary education and inspiring young graduates to enter this critically important field of veterinary science.

These government-supported rural veterinary teaching practices could play the same role in veterinary education as the public hospital system in medical training and utilise similar processes of responsibility and accountability for placement, supervision, support, and assessment. This approach is already used successfully to support medical, dental and health care in rural Australia (the Rural Health Multi-disciplinary Training Program).

#### **Recommendation 21:**

**Governments consider contracting a network of rural veterinary practices to provide teaching and government services in the regions in collaboration with veterinary schools, including teaching livestock clinical practice and government veterinary services.**



## 7.4 Rural veterinary bonding schemes

New Zealand has developed a successful rural veterinary bonding scheme to help ease the shortage of rural veterinarians working with production animals, working dogs, or both by forgiving or repaying student tuition fees. The AVA has proposed a similar veterinary bonding scheme to attract new graduates to work in rural practices that predominantly treat livestock by annually paying the graduate's HELP debt, or an equivalent amount directly, for five years.

The Australian Government in February 2023 passed legislation to wipe or reduce the student debt of doctors or nurse practitioners who live and work in rural and remote Australia. There is a provision for review, and the ability to extend the scheme to other sectors of high skills need in rural, remote and very remote Australia, including the health, mental health and education sectors.

### Recommendation 22:

The Australian Government extend to veterinarians the student debt relief provided to doctors and nurse practitioners who live and work in rural and remote Australia via a rural veterinary bonding scheme.

## 7.5 Continuing professional development

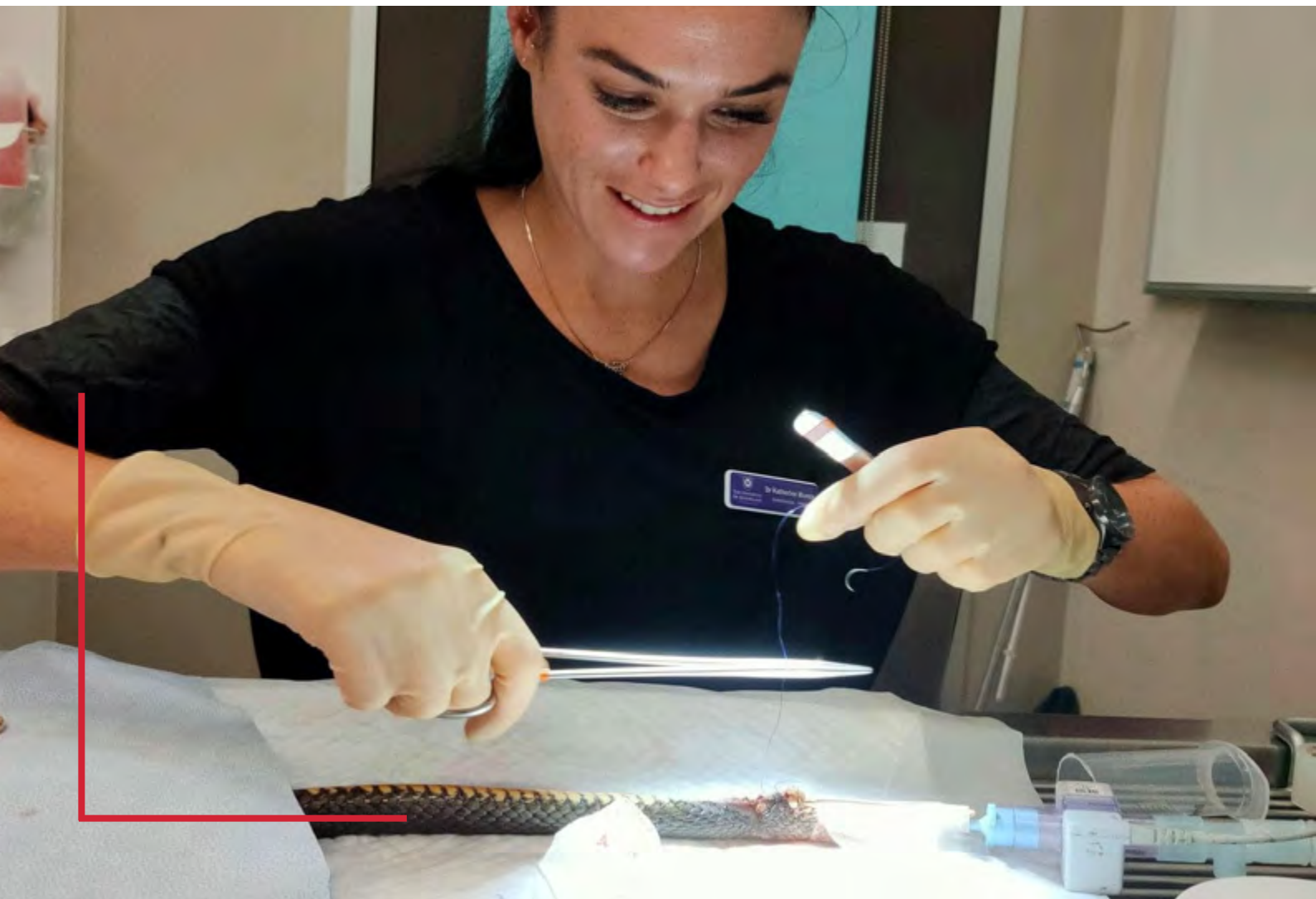
Continuing professional development (CPD) is essential to every veterinarian's working career, and different Australasian veterinary boards mandate various requirements. There are numerous forms of CPD, ranging from conferences and online opportunities to postgraduate degrees.

Australasia is also well served by the Australian and New Zealand College of Veterinary Scientists, established in 1971, which now has over 3,000 members and offers Membership and Fellowship examinations in 34 subjects, with Fellowships leading to registration as a veterinary specialist.

Veterinary professional associations are well positioned to lead in commissioning and enabling relevant career-long CPD that enhances the standards of professional practice and supports both new and experienced graduates as they transition between veterinary career paths. They should have strong (but non-exclusive) relationships with veterinary schools as active partners in CPD provision and with regulatory boards to ensure their requirements are met.

### Recommendation 23:

Veterinary professional associations develop a leading role in continuing professional development for the profession in collaboration with other providers, including veterinary schools.



## 8. FUTURE VETERINARY RESEARCH AND POSTGRADUATE EDUCATION

### 8.1 Research output of Australasian veterinary schools

Australasian veterinary schools' research programs make a significant but modest (3.08 per cent) contribution to global veterinary research outputs but a very important contribution to veterinary research in Australia and New Zealand. Australasian veterinary school researchers are of high quality, with an average of 42.6 per cent of their scholarly work published in the top 25 per cent of global journals, compared to a global average of 29.9 per cent. The research focuses predominantly on animal health, welfare and production issues, and the public health and biosecurity challenges, which are most important to Australasia with its unique farmed and natural ecosystems, public health challenges, and indigenous knowledge systems.

The financial sustainability of veterinary schools could be improved by more full-cost government and industry investment in the research priorities of the animal and public health sectors. Research funding that does not meet the full cost of the research (i.e. does not pay research overheads as well as direct costs) is a drain on the viability of the region's veterinary schools. Co-locations of veterinary schools with government research institutions can better leverage the current level of government investment in animal and public health research. They offer the benefits of scale, refresh institutional cultures, facilitate multi-disciplinary collaboration, and allow for flexible use and reuse of the facilities as government research priorities evolve. However, co-location must be actively incentivised by the management of collaborative research, co-supervision of postgraduate supervision and co-appointments.

**Recommendation 24:**  
Governments and industry increase the amount of full-cost funding in animal and public health sector research priorities and encourage the co-location of veterinary schools and government research institutions while actively incentivising collaboration.

### 8.2 Building future postgraduate education and research capacity

Australasian veterinary schools are well placed to provide complementary postgraduate training programs addressing the profession's more specialised needs and promote these in an integrated way both in Australasia and internationally. However, the maintenance of postgraduate education capacity in many disciplines can only be applied uniformly by some of the eight veterinary schools. The growing need to meet constantly evolving and complex food security, One Health, Eco-Health and Planetary Health challenges offers opportunities for different schools to play to their strengths and avoid duplication of effort and expense.

Development of a complementary R&D framework, looking for mutual/national benefit while avoiding parochial competition could ideally lead to the creation/identification of a set of centres of excellence around Australasia, some framed around domestic veterinary specialist or niche education needs; others around industry proximity and/or participation; others again around multi-disciplinary links with global relevance. In addition, working with the Australian Centre for International Agricultural Research (ACIAR) and other R&D partners to create a framework for different veterinary postgraduate research offerings by different schools could target the needs of Australasia and our Pacific and South-East Asian neighbours, strengthening our region's ability to meet these challenges.

**Recommendation 25:**  
Australasian veterinary schools and their R&D partners collaborate to develop a complementary set of postgraduate education and research programs to address key national, regional, and global needs.



# Introduction: review background and process



## REVIEW BACKGROUND

Veterinary Schools of Australia and New Zealand (VSANZ) comprises the eight veterinary schools of Australia and New Zealand, which work together to advance veterinary education and research in the region.

VSANZ commissioned a comprehensive review of veterinary education in Australia and New Zealand by an independent expert panel. This review was prompted by rapidly changing veterinary and educational challenges and the recognition that the current model of training and registering veterinarians, which has not fundamentally changed for decades, is under enormous stress. It differs from previous reviews of veterinary education by considering it an ongoing process throughout a veterinary career. In addition, it occurs within a complex stakeholder 'ecosystem' comprised of people and organisations with differing mandates and degrees of influence over educational outcomes, quality, and relevance. These stakeholders include individual veterinarians and their friends, families, colleagues, employers and clients, veterinary schools, university leaders, governments, accreditation and registration bodies, and veterinary associations.

The Terms of Reference (ToR) for the review (Appendix 1) highlighted key challenges for universities in providing veterinary education, notably the high cost of training veterinarians compared to other professions. In addition, COVID-19 and the prolonged international border closures in Australia and New Zealand have profoundly impacted the operations of the nations' universities and veterinary science schools.

However, well before this crisis, they had acknowledged collectively through VSANZ that continuing with current approaches to veterinary science education, accreditation and research would not be sustainable nor be able to deliver on Australasia's long-term needs for workforce renewal and enhanced research capability.

VSANZ raised key questions for this review to consider, namely:–

1. What are the key skills, knowledge and attributes veterinarians will need in the next decade?
2. How can accrediting bodies, the profession, Australasian universities, and governments work more effectively together to ensure that students leave veterinary schools equipped with transferable competencies needed for long and successful careers as veterinarians, as well as take account of the continued financial pressures faced by universities to sustain high-quality veterinary science programs?
3. Looking ten years out, what are the key challenges and opportunities that veterinary schools in Australia and New Zealand face regarding their responsibilities to educate and train their future veterinary workforces?
  - What needs to change to ensure the schools can address the identified challenges and take advantage of the opportunities over the next decade? Specifically:
  - What opportunities exist for structural reform to sustain Australasian veterinary schools financially? What have been the key learnings from the disruption to veterinary schools caused by COVID-19?

- Is there a place to develop a new kind of professional Australian and New Zealand veterinary qualification with modularisation/specialisation (e.g. companion animals, livestock, equine, poultry, exotic) options – whether early or post-primary-qualification stage – focused on the requirements of the nation? If so, how should this be achieved?
  - Can we make changes of the kind described above and still retain the ability of Australia and New Zealand to contribute to a global, mobile veterinary workforce with mutual recognition of qualification and freedom of movement, that is, to continue to attract overseas students and practitioners?
4. How strong is the research performance of Australasian veterinary schools in the global context?
- What is the nexus between a veterinary school's research capability and its capacity to educate veterinarians suited to the modern workforce?
  - What could be done to optimise veterinary schools' education/research mix?

## REVIEW PROCESS

The review was conducted by a panel (Appendix 2) comprising:

- **Dr Helen Scott-Orr AM PSM (Chair)** – former Chief Veterinary Officer of NSW and Australian Inspector-General of Biosecurity;
- **Professor Grant Guilford** – former Head of the Institute of Veterinary, Animal and Biomedical Sciences, Massey University and Vice-Chancellor of Victoria University of Wellington; current Chair of the New Zealand Veterinary Association; and
- **Professor Susan Rhind** – Principal Fellow of the Higher Education Academy, Chair of Veterinary Medical Education and Director of Veterinary Teaching at the Royal (Dick) School of Veterinary Studies, University of Edinburgh.

The Panel released a discussion paper in early September 2022 to canvass stakeholder ideas on if, and how, veterinary education must change to meet the next decade and beyond's foreseen demands.

Stakeholders were encouraged to make a submission to the review, addressing some or all of the matters covered in the terms of reference and the discussion paper. Questions that included and expanded upon those asked in the Review Terms of Reference were broadly categorised into stakeholder groups. Many questions were relevant to multiple stakeholders, and all stakeholders were free to comment on any questions.

Submissions were called for by the end of October 2022 and accepted until late November. In total, 69 submissions were received (Appendix 3). The Panel also undertook a series of 19 interviews until mid-February 2023 with key stakeholders to canvass issues in more depth (Appendix 4).

The combination of submissions and meetings gave the Panel access to views from a wide range of stakeholders, including:

- Twenty nine current or retired veterinary practitioners, including four small animal, 12 large or mixed animal, and fifteen specialist service or issue practice groups;
- One final-year veterinary student and one group of recent graduates;
- Two national veterinary associations;
- Eleven government and livestock industry bodies, including six Chief Veterinary Officers and staff, three industry organisations, and Animal Health Australia;
- Twenty-five university staff or groups, ranging from veterinary school staff and heads to vice-chancellors, and including all Australasian universities with veterinary schools;
- Two government university funding agencies; and
- Nine veterinary regulating bodies, including two international veterinary councils.

Several of these submissions were received from senior or retired veterinarians with deep experience in several fields of activity. Additional information was gathered on a wide range of relevant topics suggested by stakeholders and Panel members, as referred to in this report. In addition, representative views of individual submitters were quoted (anonymously for privacy purposes) to illustrate points made throughout the report.

A draft report was provided to VSANZ on 20 March 2023, with a final report presented on 3 April 2023.







## 1. CHANGING NEEDS FOR VETERINARIANS IN AUSTRALIA

Veterinarians make a critically important contribution to society. They care for the health and welfare of companion animals, livestock, performance animals such as horses, laboratory animals and wildlife. They help to ensure livestock production systems are efficient yet maintain high welfare standards. Vets also play vital roles in defending Australasia's high biosecurity status, protecting public health, assuring food safety, and conserving wildlife species.

Yet there is an emerging critical shortage of veterinarians to fill these roles in Australia and New Zealand, a situation that is causing profound pressure on animal owners, veterinary employers, new graduates and the universities and veterinary schools that educate them.

*“ There is a desperate shortage of vets ready for clinical practice. ”*

### 1.1 Farm animal and equine practice

The veterinary profession and its supporting education system developed in the late nineteenth century and focused on maintaining healthy horses and farm livestock because of their critical roles the transport and food and fibre production. Veterinary training was (and still is) linked strongly to agriculture as vets needed to understand farming systems, the role of animals in them, and how to manage them to prevent avoidable production losses. Vets had to be able to handle large animals in the field and to diagnose and deal with their health problems, with few, if any, specialist facilities. Individual animal treatment was (and is) particularly sought for regularly handled animals like dairy cows and horses.

There were few private vets servicing the vast flocks and herds of extensively grazed sheep and cattle, but in more settled areas, vets were called out to deal with major crises. Vets also offered routine services such as cattle pregnancy diagnosis, which enabled them to visit many farms and discuss wider health and production management issues with the owners or managers. Some developed special pig or poultry production and health expertise if these species were farmed in their districts.

From the 1970s onwards, lay operators began to offer farmers specific services such as cattle pregnancy diagnosis that had previously been performed only by vets. Despite protests from the profession, these lay services were legally permitted, reducing veterinary contact with farmers. More recently, the rescheduling of some local anaesthetics has allowed farmers to administer these themselves for routine procedures such as sheep tail docking or mulesing, again reducing contact opportunities and demand for rural vets to make farm visits.



A review of rural veterinary services in Australia in 2003 found that only 20 – 30 per cent of individual producers in livestock industries regularly engaged private veterinarians, usually to treat individual animals [1]. Rural practice viability was underpinned by companion animal medicine. While there was no immediate shortage of veterinarians in Australia, some rural practices had difficulty attracting and retaining experienced veterinarians. The review predicted that if no action were taken and current trends continued, shortages could emerge, starting in remote areas with practices that have a high reliance on production animal services. Twenty years on, this prediction appears to be coming true in some areas, with reports of veterinary practices in smaller country centres closing and difficulty retaining graduates in country practice. As a result, the proportion of veterinarians servicing farm livestock has declined in Australasia and internationally.

*“ With regards to farm animal veterinary work, there is a huge increase in demand for veterinary services due to the high price of livestock at this point. Unfortunately, most new graduates have poor Day 1 skills which do not allow them to undertake even simple procedures on farms. ”*

Practical clinical skills for handling, managing, diagnosing and treating individual farm animals are still required by any rural or mixed-practice veterinarians, both for effective practice and for animal and human safety, health and welfare. After-hours servicing is particularly difficult. Vets must also adapt to an increasingly complex array of diagnostic and treatment options while customising these to remote field situations. New practice models involving larger practices with more staff and more specialisation, as well as tele-veterinary and web-based services that allow farmers to consult veterinary specialists in different species remotely, may alleviate some but not all this servicing burden. Current or previous practical large animal experience is also invaluable in planning, training for, and managing responses to livestock disease and weather emergencies. However, many submissions indicated failings in this area.

*‘New and recent graduate veterinarians are not adequately skilled to perform many functions on dairy herds including accurate pregnancy diagnosis, herd health and in many cases, surgery, and medicine.’*

Although some major livestock diseases have been dealt with, and good farm practice and herd/flock preventative animal health programs to manage many conditions have been adopted widely by industry, there is a growing complexity of farm animal practice as farms expand. The economic consequences of poor animal health and welfare practices grow. This increases demand for holistic farm advisory services and sustainability assurance programs covering animal welfare and environmental practices. Veterinarians must consider the broader links and relevance of their work, such as helping farmers to reduce the contributions of different animal industries to antimicrobial resistance; and adapting to and mitigating climate change by reducing methane and other greenhouse gas emissions to maintain social licence for production and trade.

*‘Veterinary graduates are under-represented in their contribution to the grazing livestock sector.’*

While horses' original transport roles were superseded by cars, trucks and trains, and their role in mustering stock was greatly reduced by motorbikes and sometimes by helicopters and drones, horse racing and pleasure horse riding remain embedded in Australasian society, especially in rural and peri-urban areas. Equine veterinary practice has become more specialised due to the high value of horses and more complex demands from their owners. As for most other species, some degree of internship and postgraduate training, as well as strong motivation, is needed to bridge the gap between customer expectations and new graduates' skills.

*‘The equine industries of pleasure and racing demand a very high level of competency and advanced diagnostic services compared to thirty years ago...people are prepared to spend large sums of money to protect the health and welfare of their horses, but with this, there is an expectation of high-level knowledge. Few young, graduate veterinarians are prepared for immediate entry into pure equine practice.’*

*“ Farm businesses want their vets to be able to provide a whole farm advisory service rather than a clinical/emergency service. ”*

## 1.2 Government and industry veterinarians

### Food safety, public health, livestock health and welfare

From the early twentieth century, veterinarians played a key role in food safety and public health. Meat and milk inspection, hygiene, and on-farm animal health programs were (and are) critical to prevent transmission to people of serious zoonotic diseases like anthrax, tuberculosis (TB), brucellosis, salmonellosis and many others.

After the Second World War, farm livestock production (for meat, milk, eggs, wool and leather) remained important to the Australasian economy for domestic and international trade.

State/territory and national governments invested heavily (together with industry) in field and laboratory veterinary services to support these major industries. As a result, fundamental and applied research led to the development and validation of many effective vaccines against serious infectious diseases of various livestock species; and the development of many drugs against internal parasites and chemicals to control external parasites. This enabled vets to advise farmers on managing these problems more efficiently, with huge economic benefits. Vets also identified later development of some issues with chemical residues in food. They helped manage them by improving systems for registering veterinary and agricultural chemicals and by monitoring for chemical residues.

Some serious and zoonotic livestock diseases – bovine pleuropneumonia, brucellosis and tuberculosis – were eradicated or contained, and more efficient herd and flock health programs were developed for others.

Throughout the 1960s and '70s, several Australian state governments (and in New South Wales (NSW) local Pastures Protection Boards) offered cadetships for veterinarians to be educated right through their veterinary degrees, deploying them after graduation during a bonded period into field or laboratory roles, to investigate and manage livestock diseases, or as meat inspectors to safeguard public health. Until the early 1990s, in most jurisdictions, diagnostic samples from livestock were examined in state-run veterinary laboratories at no charge to the submitter or owner as a part of surveillance for and response to serious livestock diseases. This provided a fertile training ground for veterinary pathologists, microbiologists, parasitologists and epidemiologists. Some of these staff later progressed to productive research careers in many biomedical disciplines, and some to management roles in government, with skills informed by their early experience. In contrast, others went on to work with the private sector in pharmaceutical, rural or other industries.

The perceived need for these government-subsidised veterinary services diminished with the eradication of several serious livestock diseases and greater industry involvement in herd and flock health programs. Veterinary laboratories moved to a largely fee-for-service model, although most jurisdictions still maintain them, and animal disease surveillance became far more targeted.

There was a growing demand for better animal health and welfare to deliver animal products efficiently, safely and humanely. A key component of this remains veterinary certification for trade in animals and animal products, which is enshrined in the World Organisation for Animal Health (WOAH) Animal Health Terrestrial Code [2]. This certification, and the programs behind it, underpin the export of billions of dollars worth of animal products each year.

Strong national quarantine, biosecurity and surveillance programs were implemented. In addition, comprehensive contingency plans were developed to keep transboundary diseases like foot and mouth disease (FMD) out of the country and to respond promptly if they entered. Australasian vets also worked closely with our Indo-Pacific neighbours to strengthen their systems for mutual biosecurity and food security benefits. This greatly strengthened Australasia's international trade and diplomatic reputation.

By 2011, many new challenges for government veterinarians were evident (Box 1). As a result, the veterinary curriculum was expanded to incorporate research findings in many disciplines that supported these developments. These challenges will only increase in the future and require commensurate veterinary education changes.

While government veterinary roles have changed, a significant range of veterinarians is employed by all jurisdictions. In NSW, field veterinary services continue to be provided by District Veterinarians under Local Land Services, funded jointly by the state government and local ratepayers. The Australian Government Department of Agriculture and the New Zealand Ministry of Primary Industries (MPI) offer new graduate entry programs with strong further education opportunities. The need for veterinarians in increasingly complex government roles will likely continue and increase.



## **Box 1. Government vets today and in the future – An alphabet of veterinary challenges and opportunities**

**From** A Veterinary Awakening: The History of Government Veterinarians in Australia [3]

**A is for aquatic health:** There is a growing need for aquatic veterinary services driven by the strong global growth in aquaculture, and the emergence of many transboundary diseases in aquatic animals.

**C is for climate change:** Vets are already looking at possible future animal health scenarios caused by climate change. For example, arthropod-borne viral diseases are likely to continue to spread as climate change extends the range of disease vectors. In this case, veterinarians will have an important role collaborating with, or working within, public health and environmental agencies. Monitoring the global animal health environment for signals preceding emergent threats to animal (and human) health is, and will remain, a significant future challenge and opportunity for vets.

**E is for Eco-Health:** Eco-Health is a new approach to understanding and promoting health bringing together vets, physicians, ecologists, economists, social scientists, planners and others to comprehensively study and understand how ecosystem changes are implicated in newly emerging infectious diseases such as Nipah virus and Hantavirus.

**F is for food insecurity:** The Food and Agriculture Organisation estimates there were 923 million undernourished people in 2007. Since food insecurity has been steadily increasing over the past few decades, the number of undernourished people can be expected to grow. Improving livestock health and productivity is one way of increasing food security—and an opportunity for vets to help combat world hunger.

**G is for globalisation:** Globalisation has increased the potential for rapid disease and pest spread, and unsafe food reaching numerous consumers in distant markets. With the increased mobility of these threats, it's important that vets step up their efforts in building regional disease control capacity and contribute to global or transboundary approaches to animal disease control.

**I is for information:** The ability to collect and rapidly disseminate national data on animal diseases is becoming more and more essential for countries to access national, regional and international markets. Vets will continue to play a key role in developing essential animal health surveillance and reporting systems.

**L is for livelihoods:** Animal disease outbreaks and response/mitigation measures have a significant economic impact on livelihoods. These impacts are multidimensional and not always well understood. A future challenge for vets and others will be integrating research on livestock value chains into effective disease response strategies.

**O is for One Health:** Collaboration between public health experts, veterinarians and ecologists will be essential for combating emerging infectious diseases. Why? Because these diseases require management approaches combining public health, veterinary and ecological expertise, surveillance and response. Since emerging infectious diseases are on the increase, the need for collaborative approaches will also increase.

**P is for prevention:** Prevention really is better than cure, if the cost of disease outbreaks is compared with that of preventive measures. And, as animal and human health agencies move away from reactive response and towards proactive prevention, more emphasis is being placed on early reaction mechanisms and resources such as animal disease intelligence and networks. Vets have a key role to play in developing the required networks and mechanisms for early disease warning and response measures.

**S is for sustainability:** Vets need to promote and participate in animal health policy, programs and research that support sustainable natural resource management. This includes addressing the world's dwindling biodiversity.

**T is for trade:** Animal health trade issues aren't getting any simpler. Veterinary involvement will increasingly be required in the negotiation of international agreements, standards, guidelines and recommendations, as world animal health and trade environments grow more complex.

**W is for welfare:** The trend in animal welfare in Australia is one of increased citizen and consumer awareness and expectation. Vets will continue to play a role in developing welfare standards that meet these expectations while also remaining scientifically based.

**Z is for zoonosis:** Many human infectious diseases and most emerging infectious diseases are zoonotic. Highly pathogenic H5N1 avian influenza outbreaks and the H1N1 pandemic illustrate the considerable impact of such outbreaks. The zoonotic disease threat may intensify as populations continue to become more mobile, densely housed and closely associated with animals. Poor livestock health management, lack of vaccination, more intensive livestock production and increased animal product processing may also provide increased pathways for zoonoses. Combating zoonoses may become one of the most important challenges for vets in the future.



## Biosecurity and transboundary disease preparedness

Biosecurity threats are constantly increasing, requiring the reinvigoration of national capability to prevent, prepare for, detect and respond to them promptly. Key threats in recent years have been the spread of African swine fever through Asia, South East Asia and as close as Papua New Guinea by 2020, with devastating effects on local pig populations and global pork prices: the spread of lumpy skin disease of cattle and buffalo to Indonesia in 2022, with threats of future monsoonal spread to Australia of this often insect-borne disease; and the explosive reintroduction of FMD to Indonesia in 2022.

Threats that are currently slightly further offshore include major waves of highly pathogenic avian influenza that have been devastating wild and domestic bird populations across Europe, the Americas and Asia, with effects on ecosystems and poultry meat and egg prices, and troubling evidence of spread to mammals and most recently possible human to human transmission in Asia.

## Wildlife and aquatic animal health

Emerging areas are veterinary involvement in aquaculture, wildlife, and aquatic animal biology and conservation. In zoos and aquaria, in national parks and in the wider environment, managing diseases and preserving endangered wildlife have become ever more important to prevent expanding our unenviable extinction record.

Aquaculture industries balance intensified production of vastly different aquatic species, from many kinds of fish to prawns to abalone, with a close relationship with marine environments, which these industries can threaten. In addition, two-way transmission of diseases may threaten the aquaculture facility or similar native species in nearby waters. Understanding the biology of these species and the pathogens that attack them is highly specialised, as is the design of sophisticated biosecurity, facility, and incoming and outgoing water management provisions to protect aquaculture and the environment.

Climate change and environmental pollution are causing increased challenges in these fields, from treating wildlife fleeing from fires and floods to identifying and managing problems caused by plastic and chemical pollution of the environment.

## One Health, Eco-Health, and Planetary Health

The pressures of global population growth are leading to a greater appreciation of the interconnectedness of human-, animal-, and environmental health, with different frameworks moving from One Health through Eco-Health to Planetary Health [4] [5].

Macro-trends in the economy, environment and society argue for an even greater role for veterinary graduates in coming decades to increase their understanding of and involvement in:

- Adaptation to and mitigation of climate change, which is causing rising global temperatures, increasing frequency and severity of extreme weather events, and ocean acidification;

- These, in turn, impact vector-borne diseases, water and air quality, food safety and security, and mental health [6];
- The value of a One Health approach to address greater risks of biosecurity threats and emerging infectious diseases across humans, domestic and farmed animals, and wildlife [7] [8];
- The realisation that there are over 200 known types of zoonoses and that these comprise a large percentage of all newly identified infectious diseases as well as many existing ones [9];
- Helping to achieve the UN Sustainable Development Goals [10] by supporting better-integrated livestock production in diverse environments around the world [11];
- An Eco-Health and preventative approach to more complex environmental, biodiversity, food safety and public health issues, from antimicrobial resistance to chemical and plastic pollution; and
- A Planetary Health approach to creating secure, safe and sustainable food production systems to feed the world's still-growing human population while retaining our precious biodiversity and preserving the environment that makes all life on Earth possible [12].

Veterinary participation in multi-disciplinary teams addressing these complex issues will become more important.

## 1.3 Companion animal practice

Companion animal or mixed practice is the initial destination for most new veterinary graduates. However, societal demands of companion animal practitioners have changed markedly in the last 50 years. All practising veterinarians must now deal with higher expectations regarding animal welfare; and increasingly high expectations of companion animal clients due to changing lifestyles and strengthening human-animal bonds in modern society.

Since the late twentieth century, the proportion of dogs kept for working purposes has diminished. However, farm dogs for mustering cattle and sheep and specialised sectors of guard dogs, sniffer dogs and assistance dogs have become increasingly important. Likewise, cats, formerly often kept outside for rodent control, are now forbidden from roaming in many areas due to the realisation of their devastating effects on birds and other native wildlife and spend their entire lives indoors, close to their owners.

Australia and New Zealand's populations were over 86 per cent urbanised by 2020. Pets are increasingly filling social needs as societies urbanise – a trend that was hugely magnified during pandemic lockdowns and is likely to continue. Veterinarians' recognition as essential workers during the pandemic lockdown period indicates their societal value. Dogs, cats, and other small animals have become ever more important as companion animals ('fur-babies'), moving 'from the backyard to the bedroom' and providing important social and emotional support to their owners, alleviating loneliness, anxiety and depression. However, pets may remain locked up for long periods while their owners are not at home, causing behavioural issues. This extra pressure has increased demand for sophisticated medical and surgical, and even psychological, treatment of pets, analogous to human medicine, and thus pressure on universities to produce graduates who are skilled in these fields. Emergency and specialist practices are increasing, requiring high-level veterinary skills and well-equipped hospitals.

At the same time, many owners cannot afford the high cost of such specialised interventions. They may need to select euthanasia for their pets if intermediate treatment options are not presented. This requires vets to be skilled in finding appropriate practical options to manage diverse conditions while also managing owners' and often their expectations and emotions. This aligns with the notion of 'spectrum of care' where case management options exist on a continuum considering factors such as client finances, expectations, and best available evidence [13, 14].

Submissions from practice employers noted a strong need for more practical skills of new graduates in basic procedures. They also noted many new graduates' problems in dealing with owners' diverse emotional and financial perspectives.

*'The absolute core skills such as dentistry, ultrasound, radiology and basic surgery are not taught to a good enough standard to have graduating vets feel competent when entering the workforce.'*

***“There is a very noticeable decline in the surgical competencies of new graduates over the years.”***

*'It seems that basic surgical skills are insufficient, but in general, most small animal graduates have a higher level of Day 1 competencies than farm animal veterinary graduates.'*

*'They need the confidence to tackle clinical problems instead of referring for specialist diagnosis and treatment.'*



## 1.4 The changing veterinary workforce

Fifty years ago, veterinary practices were mostly staffed by one or a few vets, plus some veterinary nurses and sometimes reception/clerical staff. The more remote the area, the more likely a lone vet (often supported by their spouse) would be the only economically viable option to provide veterinary services to animal owners. In the cities, slightly larger practices were the norm, with better hospital and X-ray facilities and often animal boarding facilities. Managing after-hours work and overall work-life balance was always challenging but was better handled by larger practices. In addition, a handful of urban veterinarians offered specialist services such as ophthalmology.

Today, there is a great diversity of practice models, with a trend to much larger corporate entities in cities managing multiple practices, employing larger numbers of veterinarians and nurses, and with much better hospitals and supporting facilities. There are far more specialists with postgraduate qualifications in veterinary surgery, internal medicine, diagnostic imaging, emergency animal medicine, oncology, dermatology, and neurology. Work-life balance and professional support are far more easily accessed in small animal and specialist practice. However, in some but not all rural areas, the older practice models have remained, creating workplaces that are not as attractive to many new graduates. There is a heartfelt demand from these rural practitioners for extra staff. Still, some make the observation that many recent graduates do not have the practical skills to manage in often challenging situations with little support, nor the motivation to accept the perceived work-life balance and career development compromises implicit in small, closely held, far-flung rural practices. The evolution of larger corporate practices servicing rural clients may partly overcome this problem.

### Veterinary workforce surveys

New graduates in Australia and New Zealand often start in mixed animal practice but frequently move to narrower clinical fields [15-19]. Many graduates spend a few years in clinical practice and then move on to other veterinary careers, drawing on the strong and complex science base and understanding of animal health in different species offered in their veterinary courses. They often undertake professional development or formal postgraduate study to change. Many veterinary graduates participate in society and the economy through roles outside veterinary clinical and veterinary non-clinical practice work. A veterinary degree provides a strong foundation for careers in research, education, policy development, regulation, and the pharmaceutical and related industries.

The Veterinary Council of New Zealand (VCNZ) has conducted workforce surveys for years. Its most recent Workforce Report 2018-2019 [20] collected information from 87 per cent of New Zealand veterinarians as they applied for their 2019-2020 Annual Practising Certificate [20]. In this report, approximately 19 per cent of vets listed their field as 'mixed animal practice', with most vets listing narrower areas of work, including companion animals (38 per cent), regulatory (10 per cent), dairy cattle (9 per cent), equine (7 per cent) and large animal (5 per cent).

Key trends observed included: steady growth in the number of practising veterinarians per 100,000 population, an increase in the number of part-time veterinarians (both male and female) and an increase in the proportion of female veterinarians. Other notable observations included: no marked change in veterinarian FTE counts for each of the thirteen work type categories, compared with previous years, and a small difference (2 hours less) between the total median weekly work hours of female and male vets.

Following the VCNZ model, since 2018, the Australian Veterinary Association (AVA) has undertaken a biennial workforce survey with the state and territory boards and AVBC. The last survey in 2021 (delayed for one year by the COVID-19 pandemic) [21] had a response rate of 27 per cent of the 13,993 veterinarians registered in Australia, a big improvement from the 2018 survey's response rate of 10 per cent. Of those respondents working in veterinary roles, 80 per cent were primarily in clinical practice, 11 per cent were in government, academia or industry, and the remainder were in diverse roles, including public health, One Health, pathology, the pharmaceutical industry and ancillary veterinary services.

Of those in practice, 57 per cent were in small animal practice, 22 per cent were in mixed practice, less than 2 per cent were solely in farm animal practice, 9 per cent were in referral, emergency or mobile vehicle practice, 5 per cent were in equine practice, and the rest were in other fields including zoo/native animal facilities and commercial poultry.

Understandably, many submissions received by the Panel were based primarily on personal experiences. While these experiences were undoubtedly very real locally, not all were substantiated in the limited whole-of-profession workforce survey data available to the Panel.

The strongly held view that the veterinary profession as a whole has a retention crisis was not supported for NZ by the VCNZ survey, which showed that just over 75 per cent of NZ-trained veterinarians continue to take out an Annual Practising Certificate 10 years after the date of first registration. This is a similar rate of Annual Practising Certificate maintenance to NZ medical practitioners and nurses [19]. However, changes from rural practice to companion animal practice and from clinical practice to other (non-clinical) veterinary roles are readily identifiable trends among veterinarians as they progress. For this reason, the Panel has focused several recommendations on supporting the workforce needs of clinical practice, particularly rural veterinary practice.

However, the AVA 2021 survey provided clear evidence of major problems filling vacancies. Of all veterinarians working in practice, 77 per cent of their practices had advertised a vacancy in the previous 12 months, of which 61 per cent were to replace a vet who left the practice, and 39 per cent were new positions. Only 21 per cent of vacancies were filled within three months, while 31 per cent took more than 12 months to fill or were still not filled.



The AVA's 2021 Workforce Survey ended by asking all respondents what they believed would have changed in the veterinary profession in five years, selecting all suitable options. There were 3155 responses, grouped in order of frequency as follows:

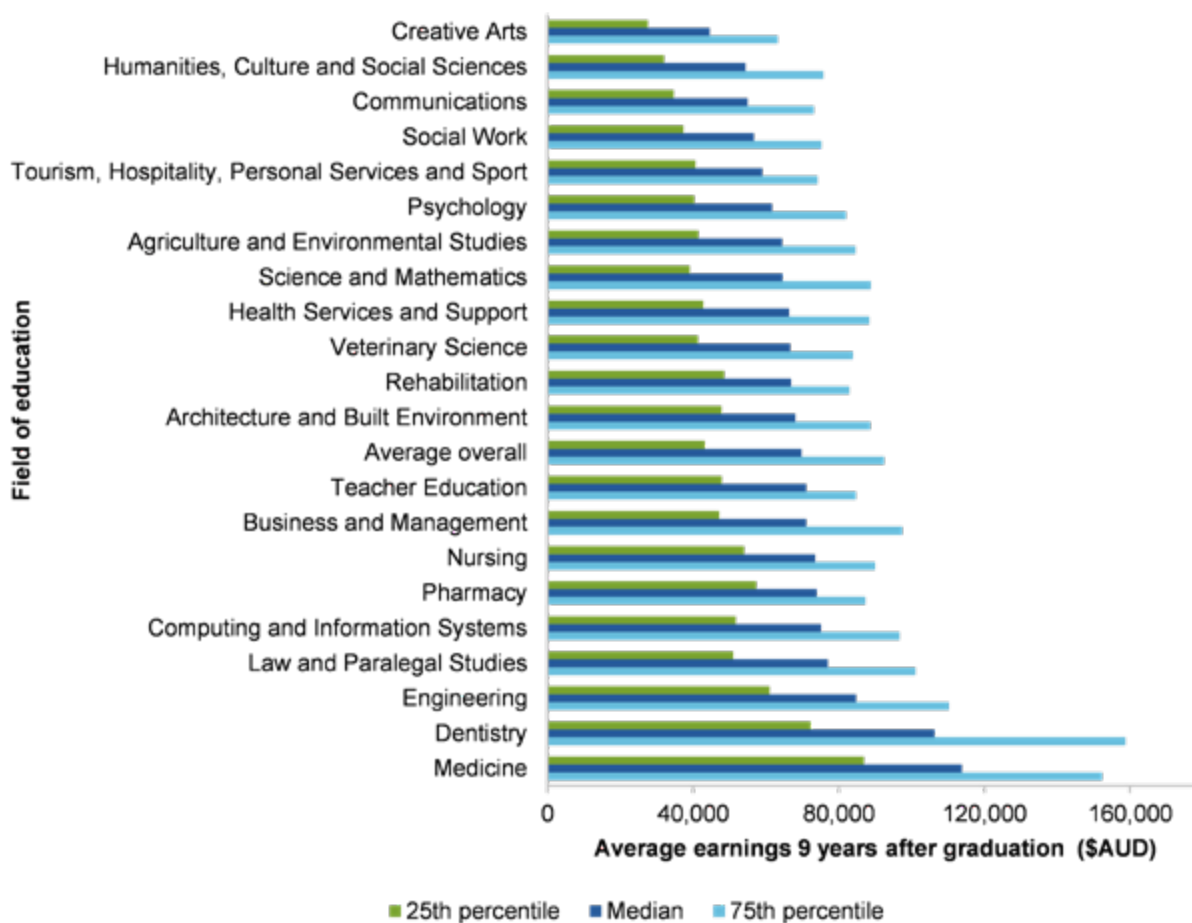
- More part-time positions 67%;
- More remote working/flexible hours/home-based roles 33%;
- Higher degree of specialisation 43%;
- Fewer but larger veterinary clinics 45%;
- More corporate-owned clinics 79%;
- Increased use of telehealth 42%;
- Increased use of artificial intelligence/technology 22%;
- Greater competition for talent 25%; and
- Other 15%.

### Veterinary salaries

The average earnings of Australian veterinarians appear to be falling behind those of other professions (see Figure 1 from the Productivity Commission's 5-year Productivity Inquiry: From learning to growth, Interim report no. 5 – September 2022 [22]). These comparatively modest salaries have the potential to create financial disincentives for students to enrol in veterinary science, given the high opportunity costs arising from five or six years of study without significant earnings. They also limit the capacity of students to pay high tuition fees as the resultant high debt becomes difficult to service. Lastly, it is possible that perceptions about the earning potential of veterinarians may be a factor in the low proportion of male applicants to veterinary schools [23] [24].

**Figure 1.** Average earnings 9 years after graduation for those graduating in 2008

The private benefits of education vary by field of education<sup>a</sup>



a. This provides only a proxy for personal benefits, as it is difficult to attribute the earnings differentials directly to education. This chart contains data for those who graduated in 2008 and reflects their average income 9 years after graduation, in 2017-18.







## 2. REGULATORY FRAMEWORK FOR VETERINARIANS AND THEIR EDUCATION

### 2.1 Regulation of veterinary practice

Veterinary graduates from approved university veterinary schools must be registered as veterinary practitioners by veterinary boards under the legislation of the relevant Australian state or territory or the Veterinary Council of New Zealand to practise in Australasia. The laws are harmonised to ensure that veterinarians registered in any Australasian jurisdiction are automatically eligible to be registered in other jurisdictions.

These boards were established in the twentieth century under Veterinary Surgeons Acts in the portfolios of Ministers for Agriculture due to vets' traditional roles managing livestock health and food safety. They prescribed 'acts of veterinary science' that could be performed only by or under the supervision of a registered veterinarian. The acts have been modernised in most jurisdictions to Veterinary Practice Acts to allow for adjustment to contemporary standards of community expectations and competition policy to be applied. However, their purposes vary according to when they were proclaimed or amended (Table 1), and now require boards to use more or less prescriptive regulation of practising veterinarians. Some jurisdictions also regulate veterinary hospitals and veterinary nurses.

**Table 1.** Purposes of Veterinary Practice/Surgeons Acts in Australia and New Zealand

#### **Australian Capital Territory – *Veterinary Practice Act 2018, Veterinary Surgeons Regulation 2015***

To ensure: the provision of veterinary services is focussed on the welfare and protection of animals; veterinary practitioners provide veterinary services professionally and competently; premises at which veterinary services are provided are of an acceptable standard; veterinary services provided in the ACT comply with standards that are acceptable to the community and meet national and international trade requirements; consumers of veterinary services are well informed about the competencies required of veterinary practitioners, and public health is protected.

#### **New South Wales – *Veterinary Practice Act 2003, Veterinary Practice Regulation 2013***

To promote the welfare of animals; to ensure consumers of veterinary services are well informed as to the competencies required of veterinary practitioners; to ensure that acceptable standards are met by veterinary practitioners to meet the public interest and national and international trade requirements; and to provide public health protection.

#### **Northern Territory – *Veterinarians Act 1994, Veterinarians Regulations 1994***

To provide for the registration of veterinarians and veterinary specialists, to regulate the provision of veterinary services, and for related purposes.



### **Queensland – *Veterinary Surgeons Act 1936, Veterinary Surgeons Regulation 2016***

An Act relating to the qualifications and registration of veterinary surgeons and the regulation and control of the practice of veterinary science, and for other purposes.

### **South Australia – *Veterinary Practice Act 2003, Veterinary Practice Regulations 2017***

To protect animal health, safety and welfare and the public interest by providing for the registration of veterinary surgeons; to regulate the provision of veterinary treatment for the purposes of maintaining high standards of competence and conduct by veterinary surgeons; to recognise the registration of veterinary surgeons in certain jurisdictions; and for other purposes.

### **Tasmania – *Veterinary Surgeons Act 1987, Veterinary Surgeons Regulations 2012***

To provide for the registration of veterinary surgeons, the regulation of the practice of veterinary surgery, and incidental matters, and to repeal the *Veterinary Act 1918*.

### **Victoria – *Veterinary Practice Act 1997, Veterinary Practice Regulations 2008 as amended at 1 October 2022***

To protect the public by providing for the registration of veterinary practitioners and investigations into the professional conduct and fitness to practise of registered veterinary practitioners; to establish the Veterinary Practitioners Registration Board of Victoria and the Veterinary Practitioners Registration Board Fund, and to repeal the *Veterinary Surgeons Act 1958*.

### **Western Australia – *Veterinary Practice Act 2021, Veterinary Practice Regulations 2022***

To provide for the regulation of the practice of veterinary medicine in Western Australia; to facilitate the regulation of the practice of veterinary medicine on a national basis; and repeal the *Veterinary Surgeons Act 1960* and *Veterinary Surgeons Regulations 1979*.

### **New Zealand – *Veterinarians Act and Regulations 2005***

To protect the public interest by aiming to ensure that veterinarians are competent to practise; and to continue the Veterinary Council of New Zealand, state the Council's functions and provide the Council with powers to: register people qualified to practise as veterinarians; issue practising certificates to specialists and people qualified to practise as veterinarians; set and implement standards for veterinary performance; and, monitor performance and, if necessary, discipline veterinarians and certain other people.

## **2.2 Competency frameworks for new veterinary graduates**

Internationally and domestically, regulatory agencies have sought to provide guidelines for veterinary education by specifying 'Day One Competencies' that define what a new veterinary graduate should be expected to know and do. A basic principle has been that veterinary graduates must demonstrate a certain level of competence in the medicine and surgery of all major species – the 'omnicompetent' vet. Yet, only a relatively small proportion of veterinary graduates now work in mixed animal practice.

The World Organisation for Animal Health (WOAH) maintains guidelines for veterinary education, including model university curricula, expected competencies, and what veterinary professionals and paraprofessionals should be taught. These underpin the international movement and trade of animals and animal products, much of which requires veterinary certification.

Australasia, the USA and the UK have all prepared and periodically reviewed competency frameworks arranged by 'domains' of learning. A review of the Australasian Veterinary Boards Council (AVBC) Day One Competencies for Australasian veterinary graduates, with extensive stakeholder consultation as part of the process, is almost complete.

The framework is structured around nine domains of competence and is similar to the American Association of Veterinary Medical Colleges (AAVMC) framework for competency-based education published in 2020 [25], with some additions reflecting the Australasian context of veterinary education, e.g. concerning veterinary public health. As well as veterinary technical ability, these frameworks emphasise non-technical skills such as communication, collaboration and professionalism.

This is particularly true of the framework described in the VetSet2Go project [26], a collaborative, multi-national project that set out to define the capabilities most important for veterinary employability and success and to create assessment tools and resources to build these capabilities (Figure 2). Funded by the Australian Government from 2015-2020, the project involved four Australian universities (Murdoch, Sydney, Queensland and Adelaide), two UK universities (Nottingham and Edinburgh) and one US university (Washington State). The most recent iteration of the Royal College of Veterinary Surgeons (RCVS) Day One Competences was heavily informed by this framework [27].

Figure 2. The VetSet2Go framework for veterinary employability



The VetSet2Go project identified **18 key capabilities** that are consistently important to employability in veterinary contexts.

These aligned to broad, overlapping domains defined by their outcome orientation:

**Psychological Resources** (for yourself),  
**Effective Relationships** (for others),  
**Veterinary Capabilities** (for the task), and  
**Professional Commitment** (for the mission),  
all activated by a central element of  
**Self-Awareness** (for the process).

A broad comparison of high-level domains in each of these frameworks is shown in Table 2, while Table 3 gives more detail on the AVBC framework and specific areas covered in each domain.

Table 2. Different frameworks for Day One Competencies of veterinary graduates

Draft AVBC Domains	AAVMC Competency-Based Veterinary Education Domains	World Organisation for Animal Health (prev OIE)	RCVS	VetSet2Go
Clinical reasoning and decision-making	Clinical reasoning and decision-making	Epidemiology	Vet capability – clinical reasoning	Veterinary capabilities
Individual animal care and management	Individual animal care and management	Transboundary animal diseases disease prevention and control programs	Vet capability – individual animal	
Animal population care and management	Animal population care and management	Emerging and re-emerging diseases Animal welfare	Vet capability – animal population care and management	
Public health	Public health	Zoonoses (including food-borne diseases) Food hygiene	Vet capability – One Health/ public health	
Communication	Communication	Communication skills	Reflective relationships – collaboration and communication	Effective relationships
Collaboration	Collaboration			
Professionalism and professional identity	Professionalism and professional identity		Personal leadership Professionalism Self-awareness and self-reflection Adaptability	Psychological resources self-awareness
Financial and practice management	Financial and practice management	Veterinary products Veterinary legislation and ethics General certification procedures	Professional commitment Business/finance Leadership/management	Professional commitment
Scholarship	Scholarship			

Notably, these frameworks largely steer clear of listing specific species, rather focusing on the ability to extrapolate from one species to another or relate to the context the graduate will be working in after graduation.

**Table 3.** New AVBC Day One Competencies for new veterinary graduates from accredited schools (from 2024)

Domain of Competence		Summary of Competencies
1	Clinical reasoning and decision-making	Animal handling, clinical examination, problem diagnosis, appropriate treatment selection and data management in varied situations.
2	Individual animal care and management	Sedation, anaesthesia, routine surgery, emergency first aid and triage, pain management, euthanasia, post-mortem examination.
3	Animal population care and management	Assess and advise on animal populations' health and welfare status, identify and report suspicious notifiable disease signs, and implement preventative programs.
4	Veterinary public health	Apply One Health, biosecurity, biosafety and infection prevention and control principles, ante- and post-mortem inspections, and food safety practices.
5	Communication	Communicate appropriately with clients, the public, colleagues and authorities, and maintain accurate clinical records for case transfer and client privacy.
6	Collaboration	Demonstrate, respect, and promote inclusivity, diversity, teamwork, and appropriate external professional collaboration.
7	Professionalism and professional identity	Professional, legal and ethical behaviour, medicine prescription and reporting, self-directed learning, appropriate referrals and time management.
8	Financial and practice management	Understand organisational, business and financial management principles and legislation, and apply risk management for animal and human health and safety.
9	Scholarship	Critically review and evaluate evidence to practise evidence-based veterinary science and contribute to advancing and spreading veterinary knowledge.

There were numerous comments in submissions about the perceived competencies of new graduates.

#### **Practical and Surgical skills**

*'What can new graduates do reliably without supervision, with minor or major direct oversight, or not do without further development.'*

*'Ultimately, the responsibility to ensure training should be the university rather than the private practices. Having functional and profitable primary accession practices at veterinary schools will help to achieve this.'*

*'The practical skills are lacking. There are a few things contributing to this. First, the practical skills and life experiences of the students entering the vet school are very urban and lacking in exposure to animals.'*

#### **Mixed and Large Animal Challenges**

*'Livestock teaching has been squeezed out of the veterinary curriculum since the 1980s because of the perceived demand for small animal veterinarians and more sophisticated procedures in small animals.'*

*'If the available resourcing around production animals and herd health management could be directed to students who identify with an interest in that field, those students will receive more of the limited resources than they would if the resources must be spread out across the entirety of a cohort of well over 100 students.'*

*'New veterinary graduates must be able to assist both large- and small-scale cattle, sheep, camelid, goat, pig and poultry farmers alike, with best practice husbandry of livestock at graduation.'*

#### **Animal Welfare**

*'Greater attention to the fundamentals of animal welfare science is needed in the curriculum. It is no longer sufficient for vets to be experts only in animal health.'*

#### **Support for professional and interpersonal skills development**

*'I was the first class to come through on that more soft skills focus degree, which was excellent. And it's good to see the carry-through of that.'*

*'An important addition to Australasian veterinary curriculums will be increased "soft skills" such as spreadsheet use, financial understanding and team leading ability.'*

*'It is imperative that veterinary schools teach skills needed in the real world, managing life and careers/work. These soft skills are vital to staying in the industry and the only way we can change the industry.'*

*'Curricula are evolving (perhaps not quickly enough). More emphasis on communication skills/ people skills, management, teamwork, there is already too much available knowledge.'*

*'In my opinion, development of life coping skills, including good verbal communication skills across many different situations, is just as important as the development of veterinary clinical skills.'*



## 2.3 Accreditation of Australasian veterinary schools by the AVBC

### Accreditation history and purpose

The Australasian system of veterinary school accreditation has developed based on the UK system overseen by the RCVS. An equivalent body, the Australasian Veterinary Boards Council (AVBC) was incorporated in Victoria in December 1999 by agreement of the state and territory veterinary boards of Australia and the Veterinary Council of New Zealand to create a legally gazetted authority to assess overseas veterinarians wishing to migrate to Australia, with power to speak and act on behalf of all registering authorities. The impetus was the devolution of the National Veterinary Examination from the federal government to the boards.

AVBC accredits all veterinary schools in Australia and New Zealand and acts on behalf of the different boards (except South Australia) to develop and assure standards for the accreditation of veterinary schools as delivering education to meet the requirements of their respective Acts.

Accreditation recognises a school as producing graduates eligible for veterinary registration in any Australasian jurisdiction. The process is harmonised with other veterinary accreditation bodies in the UK, USA, EU and South Africa. This is highly effective in ensuring Australian and New Zealand veterinary schools produce graduates who meet local legislative requirements and international standards and are recognised by the UK, North America, and other parts of the world for their high quality. It also underpins the attractiveness of Australasian universities for training many international students each year and allows the global mobility of veterinary graduates.

*'AVBC supports the value of diversity in the approach of veterinary schools to the veterinary curriculum. Veterinary schools must define their objectives to meet the AVBC standards. The veterinary school is responsible for developing and implementing a curriculum that achieves the AVBC standards. Proper internal processes are required to monitor the curriculum's implementation and make appropriate alterations as requirements change.'*

*'AVBC supports the view that basic veterinary education aims to produce generalist veterinary graduates with an appropriate foundation to practise safely and effectively in any branch of veterinary science. Knowledge and skills must be firmly based on scientific principles, and graduates with appropriate professional attitudes and attributes are required.'*

*'Graduates must recognise the need and be equipped to further develop their knowledge and skills through theoretical and in-service training, beginning in the first year after graduation and continuing throughout their professional careers.'*



## Accreditation Standards

The AVBC maintains a series of Standards against which schools are assessed at least every seven years by the AVBC's Veterinary Schools Accreditation Advisory Committee (VSAAC) through a review of a comprehensive self-evaluation report prepared by each school and then a week-long site visit to the school by a VSAAC review team.

The Standards are intended to ensure all veterinary graduates meet the agreed AVBC Day One Competencies. These Standards were reviewed in 2022 by VSAAC to ensure they meet current international best practice and support quality veterinary education, and the new Standards will be applied from 2024 [28].

**Twelve Accreditation Standards** define overall requirements for a veterinary school providing a professional degree.

1. **Organisation** – autonomy of operation within a registered higher education provider, with the School Head and the person responsible for clinical teaching being locally registered veterinarians and governance and management clearly defined and understood by all stakeholders and complying with ANZ legal obligations and best practice, including for core partnerships.
2. **Finances** – must be adequate and secured to sustain the veterinary program for the next seven years.
3. **Facilities and equipment** – lecture theatres, laboratories, clinical teaching and animal facilities (on- or off-campus) must be of adequate size, high standard and well maintained, and comply with health, safety, biosecurity, animal care and best management practice legislation and standards.
4. **Animal resources**
  - **For pre-clinical skills teaching** – normal and diseased live animals, cadavers or tissues of various domestic, native and exotic species, to study necropsy, food hygiene and veterinary public health, including access to abattoirs; supervised access to enough different domestic animals for students to become competent in their handling and husbandry; vet schools must either maintain or ensure convenient access to teaching herds or flocks of cattle, sheep, pigs and horses.
  - **For clinical skills teaching** – access to high quality, quantity and diversity of caseload for all major relevant species and others such as wildlife, rodents, birds and fish, including hospitalised, outpatient, field service patients and herd health/production medicine cases, through intramural services and contracted placements. Practical, hands-on clinical instruction and experience must comprise at least 30 per cent of the curriculum.
5. **Information resources** – libraries and information retrieval for students to access scientific and other study materials, including internet resources and equipment for developing procedural skills, e.g. models.
6. **Students and learning support** – number of students consistent with the school's resources and mission; post-graduate programs (internships, residencies and higher degrees) to complement the professional program; support for physical, emotional and welfare needs of students, including support for students from nominated equity and diversity groups; and student grievance resolution and feedback mechanisms.
7. **Admission and progression** – admit student numbers consistent with the school's resources; use clear selection criteria appropriate for students to complete the course, including factors other than academic performance, with advice on boards' requirements for fitness to practise; advise selection processes for equity and diversity groups, students with a disability or from a non-English-speaking background; advise prerequisites for entry including foundational biological sciences, credit for prior learning, processes for progression etc.
8. **Academic and support staff** – sufficient number, qualifications and competent teaching skills of academic and support staff to deliver the school's mission and program; managed academic workload and progression due to teaching, research and service; program for staff development in tertiary teaching theory/practice.
9. **Curriculum** – managed to ensure all graduates understand biological principles and processes of veterinary significance, meet the AVBC Day One Competencies and have skills consistent with the school's mission; reviewed at least every seven years by a curriculum committee, mainly of academic staff, with student representation; must include extramural studies (EMS) or workplace learning placements, in animal husbandry practical work (pre-clinical) and clinical activities with active student workup, management and treatment of patients, and with EMS provider feedback on student performance.
10. **Assessment** – 'The decision as to whether students can progress and graduate is serious, as they are entering into a social contract with the public through entry to the profession.' Assessment methods appropriate to the domain must reflect this. Direct assessment of clinical skills (some of which may be on simulated patients) must form a significant component of overall clinical disciplines.
11. **Research programs, continuing and higher degree education** – staff research activities must strengthen the veterinary degree through research-led teaching; all students must be trained in the scientific method and research techniques relevant to evidence-based veterinary medicine and have research participation opportunities; schools must provide advanced post-graduate education programs pertinent to professional and community needs.
12. **Outcomes assessment** – schools must show that all graduates have achieved Day One Competencies and evaluate and validate the veterinary program by long feedback loops (e.g. graduate destination surveys, employment rates and employment surveys) and short feedback loops (e.g. unit of study assessments).

Notably, the Standards are more prescriptive than the Day One Competencies, although they drive them. The Standards, particularly Standards 3, 4, 8, 9 and 10, require much higher levels of face-to-face contact and specialised support, facilities and equipment than any other course taught at university. This, in turn, drives the high cost of veterinary education.

The Standards are onerous and expensive to achieve, and this can create tensions between central university administrations and their veterinary schools. In addition, some argue that the AVBC Standards and the underpinning legislation of veterinary boards constrain the ability of schools to be more flexible and innovative in how they train veterinarians.

However, the veterinary regulatory authorities argue the current accreditation standards are necessary to meet government and societal expectations and protect the public, although some are willing to reflect on the prospect of over-regulation.

*'... is mindful that we must continue to produce veterinarians that meet society's needs. This may mean that accreditation standards must set requirements that are expensive or otherwise challenging for veterinary schools to meet but are nevertheless necessary.'*

*While acknowledging that a regulator is unlikely to admit to overregulating, .... does not currently see evidence that accreditation standards meaningfully constrain schools' ability to be flexible or innovative. That said, we will follow the findings of this review with interest and would support further review of the standards if there is evidence that they are unnecessarily constraining veterinary schools.'*

### **Overlap with other university regulatory and reporting processes**

Universities in Australia and New Zealand have complex regulatory and reporting requirements. In Australia, they are governed under the *Higher Education Support Act 2003* (HESA), the Tertiary Education Quality and Standards Agency (TEQSA) and Higher Education Standards Framework (Threshold Standards), the Australian Qualifications Framework (AQF) and the *Education Services for Overseas Students Act 2000* (ESOS Act); as well as by state/territory legislation with similar but not identical approaches to governance, for financial, risk, integrity, information and research ethics regulation and reporting. In NZ, they are regulated by the Education and Training Act 2020, the Tertiary Education Strategy priorities, the Ministry of Education, the Tertiary Education Commission and the New Zealand Qualifications Authority, as well as a wide array of other legislative requirements, including the Health and Safety at Work Act 2015.

University governing bodies have responsibility for strategic planning and management oversight, including in planning, financial, educational, research, legal and risk management matters. In addition, they undergo rigorous external and internal assessments to ensure expenditure on research, teaching, and student services is of high quality:

- Their teaching and research quality is regularly assessed by scheduled academic program, whole-of-university, and whole-of-sector reviews;
- Each course and lecturer is assessed by their students, with results used to reward teaching excellence through promotion rounds and identify where remedial action is required. In many institutions, student assessment of teaching is augmented with peer assessment of education;
- Universities' compliance with numerous Acts and regulations is reviewed annually using integrated compliance reporting software to ensure all legal obligations are met;
- They operate finance, audit, risk committees, and robust risk management processes reporting through to their governance boards/councils;
- Demanding health and safety and staff and student well-being obligations exist in law and are assertively monitored internally and by external agencies; and
- Internal audit programs proactively probe risk areas detected by university governance and management. In addition, government-appointed external auditors annually review the institution's financial health and performance against the government's service priorities.

Also, many external accrediting bodies – all with different cultures and approaches – regularly review the universities' professional programs. In addition, multiple other accrediting bodies sometimes check the same professional program employing different standards and practices (as with Veterinary Science).

The wide overlaps between these processes and AVBC/VSAAC accreditation can cause high costs and duplication of effort for universities and their veterinary schools. Therefore, it is important that the VSAAC evaluation teams note and not duplicate existing university management and quality assurance processes but continue to refine the standards with the schools.

In Australia, university oversight and funding are virtually all at the Commonwealth level. At the same time, veterinary boards are responsible to their states and territories, which have powers and jurisdiction within their borders under the Australian Constitution. As a result, there is little interaction between veterinary boards and government higher education regulators and little opportunity for higher education authorities to align decisions made by the boards on universities with current higher education priorities, quality assurance mechanisms and funding. Veterinary boards are not alone in this challenge, with many other professional bodies making similar demands of the higher education 'public purse' (through accreditation requirements) without clear accountability to those making the difficult trade-offs needed in higher education funding.

Given the high level of pre-existing oversight of universities and the collectively high cost of these processes, the Panel believes there is room for VSAAC to narrow the scope of their accreditation reviews into matters that are not otherwise assessed by the existing university-wide compliance processes.



### Assessing learning outcomes rather than inputs

Detailed guidelines for demonstrating that schools achieve the Standards include the provision of indicative satisfactory, unsatisfactory and unacceptable ratios for various teaching inputs, with satisfactory ratios being:

- No more than 7.5 students per teaching staff;
- At least one support staff per teaching staff;
- At least as much practical and clinical as theoretical training, and at least 1/4 of the total training being clinical;
- At least 20 livestock and 50 pets available per student graduating; and
- At least four animals available for post-mortem examinations per student graduating.

Failure to achieve these ratios and many other 'input' parameters may result in a school achieving only provisional accreditation, with a requirement to correct deficiencies within a year or risk loss of accreditation.

In particular, the 'indicative' staffing ratios are a major source of tension between university administrators, veterinary school staff and accrediting bodies. The Panel heard from AVBC/VSAAC that historically, VSAAC adopted the European standard, which the RCVS also adopted. These ratios are 'just indicators' and would not mean automatic non-accreditation. Nevertheless, the new standards continue to include ratios, including 'The ratio of teaching staff to students is not more than 1FTE:7.5FTE' [28].

Unsurprisingly, a Deloitte (2016) report on the cost of delivery of higher education found that the two highest cost fields of higher education study – Dental and Veterinary Studies – had the lowest student: staff ratios, noting that 'the number of EFTSL per teaching staff (in FTE terms) varied significantly by field of education, with an overall mean of 19 EFTSL per FTE teaching staff (and median of 22 EFTSL per FTE). Dental Studies and Veterinary Studies had substantially lower ratios...' [29].

The background to adopting these staffing ratios underscores the important global connectivity of the veterinary profession. However, they may no longer be fit for purpose in modern Australasian higher education teaching practices. Moreover, while some aspects of veterinary programs require low staff: student ratios, it is less certain that implementing a fixed whole-of-program staffing ratio is justifiable.

Several submitters questioned the necessity and effectiveness of some of the accreditation requirements and processes. Others felt that the inflexibility of accreditation requirements compromised their ability to be innovative in their educational delivery, compromising both learning and cost-effectiveness. These views were strongly held, including at the highest levels of universities.



Accrediting bodies add the most value in the very important areas of curriculum relevance and outcomes assurance; that is, in helping to define the key learning outcomes of most relevance to current practising professionals and assuring that these outcomes have been achieved by outcomes assessment processes, rather than in determining how a curriculum is designed or taught to achieve those outcomes.

Regardless of individual course structure, the drive towards outcomes-based approaches using the frameworks described above is moving the focus of accrediting bodies more from content to schools being asked to provide evidence that the outcomes have been met and evidenced using relevant assessments of competence.

High-quality veterinary education to meet the expectations of society is expensive. Accreditation standards currently impact all the key drivers of cost in veterinary programs – including staffing, animal resources, facilities, the breadth and depth of the curriculum, and the balance between the core curriculum (that must be taught to all students) versus electives (that are taught to smaller groups of students).

However, the setting of requirements should be accompanied by a rigorous assessment of their necessity and cost-effectiveness, a careful analysis of the potential contribution of proposed requirements to the desired learning outcomes, and whether there are less expensive alternatives to achieve a similar educational result. Universities routinely undertake these analyses in their academic programs to ensure they use public and student funds wisely to achieve maximum educational advancement with the funds available. This financial discipline can avoid unnecessary costs being passed on to students, employers, clients and taxpayers.

The new AVBC standards are moving from a strong focus on inputs to a broader assessment of inputs, processes, and outcomes. Veterinary schools strongly support this change, considered critical to ensure the schools have the confidence and flexibility to adopt innovative learning and teaching methods. However, there was frustration about the time taken to adopt outcomes assessment. VSAAC signalled its interest in emphasising the outcomes of veterinary education and reducing reliance on input measures as early as 2004 [30], yet progress appears to have been very limited since then. Although the new assessment methods and standards are scheduled for implementation in 2024, VSAAC views their implementation as a 'transitional process' with the intention, as outcome measures become more robust, that VSAAC will focus on these more in future. The Panel believes it is essential that VSAAC quickly defines a set of high-level learning outcomes that it will use to accredit veterinary programs to ensure that schools can embrace new pedagogies, delivery technologies and partnering strategies.

### **International harmonisation**

VSAAC review teams may include as members international visitors from other accrediting bodies such as the RCVS or the American Veterinary Medical Association Council of Education (AVMA CoE). Similarly, VSAAC visitors may participate as members of overseas accreditation review teams. This enables a common approach that underpins later student and graduate mobility.

While this process worked well in the past, some differences are appearing in how the RCVS approaches the transition from input to outcome measures, compared to AVBC and AVMA, with the possibility of different inspection and reporting standards and even separate site visits. The Panel heard a very strong plea for the various veterinary accreditation bodies to ensure a high degree of commonality of standards and processes to avoid unnecessarily repetitive compliance burdens on the hard-pressed staff of the schools. In the words of one submitter, 'What was cohesive is fragmenting'.

VSAAC also undertakes accreditation visits in other countries that may not have the same degree of university oversight and where input measures may be more appropriate. However, these international accreditation duties do not justify imposing unnecessary compliance costs on Australian and New Zealand universities.

### **Recommendation 1: AVBC and VSAAC (along with international regulatory partners where appropriate) work with veterinary schools to:**

- **Review the accreditation process to remove requirements that duplicate Australasian universities' many other accountability and quality assurance processes;**
- **Review the necessity and cost-effectiveness of each accreditation requirement in light of the desired learning outcomes; and**
- **Accelerate the transition from assessing teaching inputs to assessing learning outcomes as the principal basis for accreditation of veterinary programs.**



### 3. VETERINARY EDUCATION PROVISION AND FUNDING IN AUSTRALASIA

#### 3.1 Veterinary school development

The first veterinary school in Australia, Melbourne Veterinary College, established privately in 1888, became part of the University of Melbourne in 1909. The University of Sydney opened its Department of Veterinary Science a year later, in 1910. The University of Melbourne Veterinary School closed after 1928 and only re-opened in 1963. So, between 1928 and 1940, all Australasian veterinary graduates were from the University of Sydney.

Geographic and demographic pressures led to the establishment of other schools:

- University of Queensland (1936) in Brisbane; and
- Murdoch University (1975) in Perth.

While the Frawley Report (2003) [1] into rural veterinary services found that increasing the number of veterinary schools in Australia was not essential at that time to meet rural veterinary workforce demands, different political, professional and institutional drivers led to the opening of three new veterinary schools:

- Charles Sturt University (2005) in Wagga Wagga, with a focus on rural veterinary studies;
- James Cook University (2005) in Townsville, succeeding a graduate school of Tropical Veterinary Medicine established in 1969; and

- University of Adelaide (2008), to address a severe shortage of veterinarians in South Australia.

Aspiring veterinarians from New Zealand had to travel to Australia to train until 1963, when Massey Agricultural College (now University) established its veterinary school at Palmerston North.

The eight veterinary schools in Australia and New Zealand offer different degree options. Still, all provide a pathway for graduates to practice as a veterinarian in Australia and New Zealand (as well as the United Kingdom and some other countries, depending on the school). The list below shows the courses(s) offered by each school.

- Massey University: 5-year course leading to Bachelor of Veterinary Science (BVSc).
- James Cook University: 5-year course leading to Bachelor of Veterinary Science (BVSc).
- University of Queensland: 5-year course leading to Bachelor of Veterinary Science (BVSc).
- University of Sydney: 6-year course leading to Bachelor of Veterinary Biology (BVetBiol) and Doctor of Veterinary Medicine (DVM); 4-year DVM can be undertaken following another suitable undergraduate degree.



- Charles Sturt University: 6-year course leading to Bachelor of Veterinary Biology (BVetBio) and Bachelor of Veterinary Science (BVetSc).
- University of Melbourne: 6-year course leading to Bachelor of Science (BSc) and Doctor of Veterinary Medicine (DVM); 4-year DVM can be undertaken following another suitable undergraduate degree.
- University of Adelaide: 6-year course leading to Bachelor of Science (Veterinary Bioscience) (BSc (VetBiosc)) and Doctor of Veterinary Medicine (DVM); 3-year DVM can be undertaken following another suitable undergraduate degree
- Murdoch University: 5-year integrated course leading to Bachelor of Science (BSc) and Doctor of Veterinary Medicine (DVM).

The number of veterinary graduates per year has increased dramatically in recent times. Three of the current eight veterinary schools opened within the last 20 years, and existing schools have increased their intake so that the number of veterinary degree completions in Australasia is projected to rise from less than 500 in 2008 to over 900 by 2025 (of whom around 20 per cent are international students).

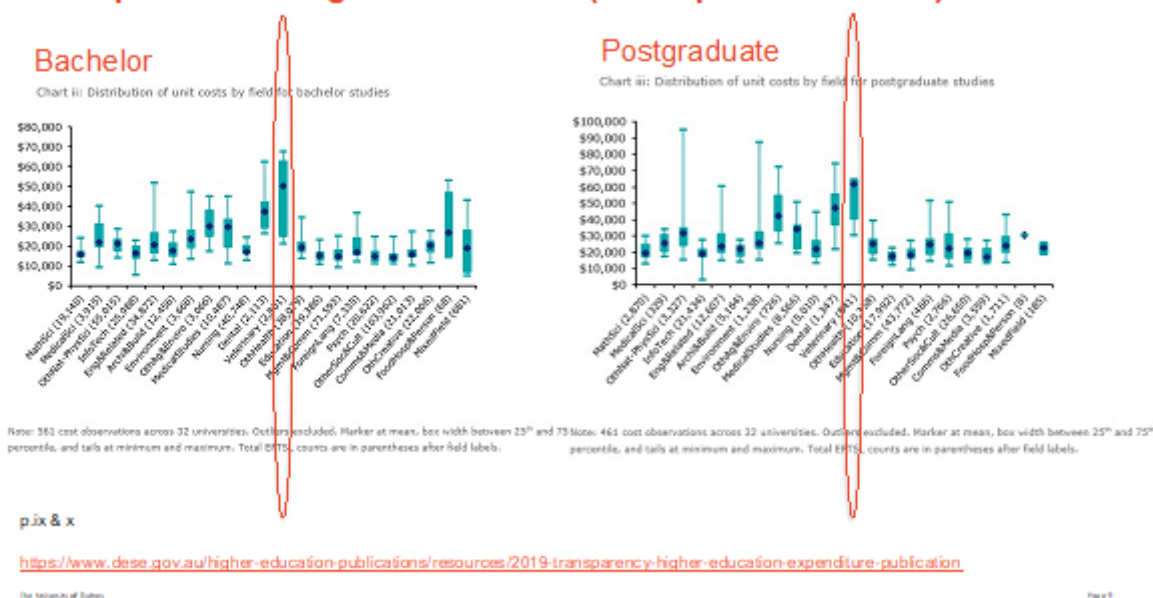
### 3.2 Cost of delivering veterinary courses

Veterinary Science courses, both undergraduate and postgraduate, remain the most expensive professional courses for universities. Figure 3 shows the average annual cost per Equivalent Full Time Student Load (EFTSL) of bachelor and postgraduate studies across all Australian universities in 2018.



Figure 3. Average cost per EFTSL of different bachelor and postgraduate studies

### Transparent costing exercise 2018 (latest published data) Vet. Sci.



This high cost of Veterinary Science education is understandable when competency requirements for new veterinary graduates are compared with those of other similar disciplines, especially Medicine and Dentistry. For example, medical graduates are not expected to be competent at graduation in many skills expected of new veterinarians, such as primary clinical diagnosis and treatment of disease, anaesthesia, dentistry, and surgery.

Rather, medical trainees must complete two years of postgraduate residency in a public hospital before being eligible to practise as junior doctors. Many medical graduates also undergo further specialist training in their chosen areas of specialisation. The Commonwealth, state and territory governments share the salary and other costs of providing medical student internships.



These governments also make substantial financial and in-kind contributions to the costs of pre-registration training of dentists through public dental clinics. Most significantly, trainee doctors and dentists deal only with one species whose restraint and management during diagnosis and treatment is not problematic in most cases.

Many of the huge breadth of practical and technical veterinary skills, often highly specialised, can be learned only in small groups with low student: staff ratios to provide effective guidance, reduce health and safety risks, protect animal welfare, and ensure the best possible clinical outcomes. Students must have opportunities to practice techniques initially in 'safe' environments, e.g. clinical skills laboratories, then progress to live animal work using facilities and infrastructure to support a wide range of species and practical teaching models.

Diluting this practical activity too far would fundamentally change the nature of the degree. Still, the level to which it is applied to different species while maintaining an all-species theoretical core needs consideration.

In contrast to human medical training, no public hospital network is available to facilitate this skills development. Instead, veterinary schools must provide their animal resources, including maintaining teaching herds and running their teaching hospitals (which usually operate at a considerable loss due to the time required to give the students closely supervised, hands-on, clinical experiences) or contract clinical teaching to other providers. Schools incur high capital costs providing space for small-group practical teaching and specialised plant and equipment for dissection, post-mortems, infectious disease control and animal handling. Providing students with practical experience in dealing with large and small animals is particularly expensive.







## 4. THE CHANGING PATH THROUGH UNIVERSITY TO THE WORKFORCE

### 4.1 Admissions to veterinary courses

Admissions to professional veterinary courses effectively define the future make-up of the profession since extremely low attrition rates characterise veterinary courses. Yet the profession suffers from limited diversity and a current looming or already realised recruitment crisis.

The veterinary profession in Australasia (and globally) has changed significantly over recent decades. Most applicants come from urban backgrounds, mirroring the Australasian population of over 86 per cent urbanised by 2020.

The gender mix of students has reversed from almost exclusively male in the early days of veterinary schools through gender parity (reached around 1990) to the current situation where almost 80 per cent of veterinary students are females (a similar proportion to those who apply). This shift is 'washing through' the veterinary workforce. In the AVA's 2021 workforce survey, over two-thirds of respondents were female. In New Zealand in 2019, the median age of male and female veterinarians was 51 and 38 years respectively.

#### Admissions process

The admissions process for veterinary students continues to strongly emphasise academic achievement as there is good evidence from medical and veterinary medical education studies that academic performance at admission correlates with academic performance throughout the course [31, 32].

Consequently, the selection at some universities is primarily on academic merit. In contrast, at others, a slightly lower tertiary entrance ranking cut-off is accompanied by an interview process or aptitude / situational judgement testing to select for other 'soft skills' or problem-solving attributes.

Internationally, in those schools that use interviews as part of their admission process, there has been a trend in recent years (following medical education) to move to the format of multiple mini-interviews (MMIs) as a means to assess a broader range of non-cognitive attributes [33]. A systematic review of MMIs in medical education showed them to be a feasible and acceptable approach, with interview stations (ideally 7-12) being blueprinted to attributes considered important by the school. However, there is evidence that some under-represented groups may perform worse using this format, a finding which is highly relevant to this review [34]. Another admission tool is the use of CASPer (Computer-Based Assessment for Sampling Personal Characteristics), a situational judgement admissions test that aims to measure traits like collaboration, equity, problem-solving, empathy, ethics and self-awareness [35]. More challenging is the use of weighted lotteries, which have been suggested in medicine as a way to 'harness randomness to our benefit' and address / attenuate inequity associated with race, gender, or socioeconomic status [36].



The Panel received many comments on the admissions process's critical importance in determining the profession's make-up and balancing academic achievement with essential personal and professional attributes. Some words also focussed on the need to select for resilience whilst accepting the challenges.

*'I believe the selection process to be too focussed on academic merit.'*

*'xxxx supports the concept of the veterinary admission process paying less attention to academic performance, and more attention to community needs through an interview process.'*

Some employers consider that graduates selected by these more complex processes may perform better and remain longer in practice than those from purely academic streams.

**“ Using academic achievement as the sole recruitment criteria is outdated and inappropriate for the modern vet. ”**

### **Equity and diversity**

The Panel believes the profession will be healthier and more relevant to communities if it mirrors the diverse make-up of modern society. Interventions are already showing promise in this area. For example, in New Zealand, where Māori and Pasifika make up 17 per cent and 8 per cent of the population, respectively, but only 0.46 per cent and 0.3 per cent of the veterinary profession [20], a new pathway (VetMAP) has been introduced at Massey University, to enhance selection and retention of Māori and Pasifika students by providing them with tailored academic, cultural and pastoral support.

The Australian Government's JobReady Graduates Package introduced an Indigenous, Regional and Low SES Attainment Fund (IRLSAF) in 2021. This combined funding from existing programs ensures that indigenous students and students from low socioeconomic and regional backgrounds have more opportunities to attend university and receive better support once they get there. Since 2021, all Aboriginal and Torres Strait Islander students who live in regional and remote Australia have been guaranteed a Commonwealth-supported place at a university of their choice when accepted into their chosen course of study. An eligible university place is a non-designated, bachelor-level course at an Australian public university. In 2021, 160 more Aboriginal and Torres Strait Islander students from regional and remote areas were expected to benefit from this policy. This is likely to rise to over 1,700 students by 2024.

Inclusion needs to accompany diversity. Comfortable environments and academic and other support are vital for those with backgrounds, life experiences etc., that have not necessarily included recent or often any significant study demands.

### **Gender**

The Panel heard strong views about the perceived workforce consequences of the rapidly growing proportion of female veterinarians, along with suggested changes to veterinary school admissions processes to reverse this trend. Some submitters would like more male applicants to be admitted to increase the percentage of males in the profession, thereby addressing perceptions that staff workload and retention issues are exacerbated by women meeting family responsibilities or being unwilling to move into rural practice.

However, few of these concerns appeared to be significant in the whole-of-profession workforce data or the university admissions data. The current gender balance of admitted students reflects those who apply, raising the question of why a veterinary career is now less attractive to men than women. Furthermore, an analysis of the median routine work hours per week by practising veterinarians by gender between 2009-2018 revealed only modest differences, narrowing to 40 vs 42 hours for women and men respectively by 2018 [20]. There was no difference between genders in the regular work hours worked per week for those under 30 years of age, after which male vets' median routine work hours became higher than those of female vets [20]. Over the 2009-2018 period, there has also been a steady growth in the number of veterinarians working 'part time', with the most common reasons for this choice being an elective decision to work part-time, personal preference, and to carry out family care. The only fields of veterinary work where women are under-represented in comparison to men are consultant and managerial roles [20].

Accordingly, the Panel has not made any recommendations to alter the admission process to try and reverse the reduced popularity of the profession among males. Instead, the real challenge may be for the profession to better communicate both the opportunities and realities within the profession more broadly within the community and to prospective students from a young age and to adopt employment practices that accommodate the increasing interest in part-time roles.

**Recommendation 2:**  
Veterinary schools should widen their mainstream admissions processes to select students on a broader range of excellence, equity and diversity than solely academic achievement and collaborate on admissions research to evaluate new approaches.

### Admitting students committed to rural and government practice

The Panel heard compelling evidence from employers about the difficulty of maintaining a viable workforce in rural practice and rural government work whilst recognising the criticality of these roles concerning national biosecurity, food safety and the livestock industry more broadly. There were pleas from some submitters to select more students from rural areas, arguing that they would be more likely to enter and stay in rural practice.

*'Quotas for regional students to access places in veterinary degrees should also be considered – creating streams that allow those interested in regional and livestock work to ensure numbers are filled for these specialised sectors.'*

Part of the solution to this urgent problem could be recruiting to a track in rural/government practice as a deliberate process, discussed more fully in section 4.4. This approach has been used successfully at Utrecht University in the Netherlands [37], and recruiting into specific practice fields is the norm in some other disciplines (e.g. engineering). However, the panel also notes the views of accrediting bodies that this approach would not necessarily require limited licensure, assuming relevant CPD and supervision were in place should graduates elect to change career paths at a later date.

The intent would be to set the number of students in these streams to deliver sufficient future capability to meet demand while tailoring some of the most expensive parts of the veterinary course more closely to the demonstrable needs of each country. Importantly, the coupling of a specific entry pathway to a rural/government track allows the development of a broader set of skills to integrate rural veterinarians into the provision of services that have industry and community-wide benefit – a key recommendation of the demand-based approach to strengthening rural veterinary practice recommended by Frawley (2003) [1]. As Frawley noted, rural veterinarians are already familiar with providing services for government programs. However, there is a need to broaden the skills base of rural veterinarians to enable more to offer a wider range of services to producers. Several submitters endorsed these views.

*'From a production animal point of view (sheep, beef, dairy), I believe that farm businesses want their vets to be able to provide a full farm advisory service rather than purely a clinical/emergency service.'*

*The current curriculum gives graduates the necessary knowledge to advise on herd health; however, with non-veterinary competitors also offering this service along with nutrition, genetics, agronomy, and farm economics, it leaves the veterinary profession at risk of becoming irrelevant.'*

It is unlikely that all students admitted entering rural or government practice will remain committed to this unless they are bonded into a cadetship, as in the last century. Nevertheless, it remains important for veterinary schools to attempt to meet the demand for rural/government veterinarians that currently exists while at the same time playing a leading role in broadening the skills base of future rural veterinarians to enable them to offer a wider range of services across farming systems and, potentially, the natural ecosystems in which agriculture is inextricably embedded.

Further consideration of managing the transition to practice of graduates from a rural/government track is in section 7. However, for this approach to be successful, further work may be needed to characterise demand and drivers influencing individual decisions to enter and remain in rural practice, such as improvements to rural practice viability and better terms and conditions for staff.

**Recommendation 3:**  
Veterinary schools consider supplementing the mainstream admission process with an additional entry pathway targeting applicants committed to rural or government veterinary practice, subject to demand.

### Supporting admissions decisions by improved data on veterinary workforce trends

The issue of a national admissions process for Australia was raised. There are many impediments to this, mainly the potentially high costs for schools of creating a comprehensive decision-making process that would serve the interests of all schools and not impose high costs on them. However, Australian veterinary schools would be assisted in their admissions and education decisions by access to more comprehensive and timely veterinary workforce trends, as is available in NZ. AVBC is exploring establishing a universal registration database in Australia that could underpin a regular workforce survey. This would provide valuable objective evidence on veterinary workforce trends and help veterinary schools assess the adequacy of admissions and education processes. In addition, such a survey should include regular assessment of graduate outcomes, including graduate perceptions of the adequacy of education and employer perceptions of and experiences with new and other graduates. If conducted well, this could significantly improve the efficiency and consistency of outcomes assessment of accredited veterinary science programs.

**Recommendation 4:**  
AVBC establish a universal veterinary registration database in Australia and work with the AVA to undertake an annual workforce survey.

## 4.2 Changing how veterinary curricula are structured

### Evolution of undergraduate veterinary curricula internationally

A fundamental structural decision in veterinary curricula is whether the degree is followed as a five- or six-year undergraduate option for high school leavers or whether it is an option only for graduates with a relevant first degree. The dominant model in Australasia and Europe is a five- or six-year undergraduate option; the consistent model in North America is a four-year DVM program following completion of a relevant first degree. However, in recent years, many programs have either introduced a graduate entry option running in parallel with the undergraduate model or have moved completely to a graduate entry model.

The competency frameworks discussed in section 2.2 provide a comprehensive guide to the outcomes each student should achieve by graduation. However, many varied curriculum models exist to deliver these outcomes, as befits a healthy educational ecosystem. Compared to 20 years ago, there is now much more integration within curricula and a general trend towards less division between ‘preclinical’ and ‘clinical’ subjects. Most curricula directly address clinical and professional skills from the first year, although for many, clinical rotations are mainly positioned in the final year, with some having a transition to clinics in the preceding year. Some curricula are systems-based, often described as ‘spiral’ models where systems are revisited several times through the curriculum, progressing from normal to abnormal. Others are based on species-level integration of medicine and surgery. Yet others are more granular, with small discrete courses that may be brought together using ‘capstone’ assessments or other integrating tools such as portfolios.

### Absorbing new knowledge

Many curricular models exist to deliver outcomes and competencies to be achieved by each graduating student. However, these curricula are under pressure due to the rapid growth of veterinary science knowledge and expertise across widening and more complex multidisciplinary fields. For example, the number of veterinary research/scholarly outputs recorded yearly in the Scopus database trebled from 1996 to around 26,000 in 2020. This expanding knowledge base has important implications for curriculum designers – in terms of keeping the curriculum up to date and ensuring that students gain appropriate skills in evidence-based medicine to help them thrive in a future that will continue to be flooded with additional information.

Fundamental education in scientific principles underlying

different subjects is critical to graduates’ later ability to extrapolate from core teaching to deal with novel species or situations and move into different career paths. The breadth of topics relevant to the current veterinary context is, however, expanding to include areas such as wildlife biology and management; aquaculture and other novel animal production systems; One Health and zoonosis risk management; sustainability in general and impacts of climate change and environmental pollution on animal-, human-, and ecosystem health and welfare. In addition, with increasing emphasis and understanding of the importance of topics such as animal welfare and animal behaviour, there is extra pressure on curriculum leaders to manage content and not overload students while exposing them to these key areas.

*‘Veterinary medicine educational institutions must demonstrate that veterinary medicine students are afforded appropriate training in the awareness, practice, and promotion of sustainability within their work.’*

*‘Greater attention to the fundamentals of animal welfare science is needed in the curriculum. It is no longer sufficient for vets to be experts only in animal health.’*

To make space for their favoured areas, some submitters suggested removing other content they believe to be less important, such as particular referral or specialist-level material, which they suggested might better be taught at the postgraduate level. A few suggested extending the length of veterinary courses by one year to allow for more in-depth teaching of different areas, but longer periods of training would, in turn, increase the costs of veterinary courses further, and this was broadly regarded as an issue even with the move from five-year to six-year degrees.

The pressure on space in the curriculum is a well-recognised problem – indeed, some submissions highlighted the potential link between overcrowded curricula and well-being:

**“We believe that the relative curriculum overload in the program contributes to mental health challenges for veterinary students.”**

This lack of time is compounded by the need for veterinary students to undertake extra-mural studies (EMS) during their vacation – both in animal husbandry and clinical placements. The new AVBC Accreditation Standards have reframed this as extra-mural work-integrated learning (WIL) and will require 25 weeks across the program, which remains a significant time investment for students.



### **Recommendation 5:**

**The core of veterinary curricula remains based on a broad but integrated body of knowledge, principles and skills that equip students with the potential to transition between different career paths within the veterinary profession.**

#### **Curricula informed by educational research and development**

Veterinary education research over the last 10-20 years has explored several themes linked to the many changes and features characterising most modern veterinary curricula [38-43]. A general trend has been a recognition of content overload and the need to rebalance factual knowledge with the skills and professional attributes required to succeed in the profession. One of the earliest areas to be addressed was introducing and embedding communication skills training within curricula [41]. It is pleasing to see outcomes evidence from employers and graduates of the success of this initiative.

Other significant areas of change include:

- Increasing emphasis on clinical skills teaching and assessment, often supported by well-resourced clinical skills laboratories [44];
- Increasing emphasis on the vet as a professional and the importance of professional identity formation [45];
- Methodological changes to teaching are afforded by technological advances – e.g. flipped classrooms, the use of body cams, video resources, and virtual slides;
- Greater use of problem-based learning and case-based learning;
- Increasing emphasis on the concepts of One Health, global health and sustainability; and
- Recognition of the importance of support through critical transition periods – into, through and out of the curriculum (see below). This includes support and curriculum interventions concerning mental health and general well-being.

This curriculum evolution has occurred in parallel with a generally increasing recognition of veterinary education as a discipline in its own right. As a result, veterinary education conferences are popular. The community is strong and collaborative [39] with the VETED conference model that began in the UK now extending to Australasia and Africa.

### **Recommendation 6:**

**Veterinary schools continue to engage in collaborative educational research nationally and internationally.**



### 4.3 Well-being of veterinary students and new graduates

The wide-ranging concerns about pressures on students and new graduates and mental health issues observed among them may partly reflect reports of increasing mental health issues in Australasia, especially among young people, young women, and rural communities – a similar demographic to veterinarians [46]. Australian vets have grappled with mental health issues for years – in 2021, the suicide rate was four times higher than the general population.

In recent years, veterinary educators have intensively canvassed the best ways to embed well-being strategies within the curriculum. A recent systematic review of curriculum interventions suggested that short courses or workshops embedded in the early curriculum showed promise, e.g. mindfulness and cognitive behavioural exercises [47]. Some studies' focus has moved from identifying the problem to identifying protective factors that may help students and veterinary professionals develop strategies that enhance their well-being and satisfaction in the workplace. It has been argued that excessive emphasis on strategies for self-care and the development of 'coping' strategies can paradoxically create a framework where work is associated with negative connotations [48] and a reactive approach to the problem [49]. Whilst there are inevitable stressors related to the veterinary profession, focusing on positive psychology interventions and self-care (supported by appropriately qualified professionals) may be helpful [50].

*“ Part of the curriculum can be around positive psychology and understanding mental health and its importance with proactive mentorship systems in place (staff and student). ”*

*‘The deteriorating student mental health is reflected in the entire profession. I believe veterinary schools offer training in resilience and well-being; however, I question whether students see this as important at the time.’*

*‘Students and emerging veterinarians need resilience and the ability to have boundaries, as this will help with their massive issue of burnout/ depression and suicide in the industry.’*

*‘Emotional intelligence, resilience in the face of difficulty, and decision making are the hardest things to teach but also seem to be lacking in many newer graduates.’*

*‘Mental health and well-being education within and throughout the curriculum (e.g. dealing with stress/managing anxiety, compassion fatigue, boundaries, self-care, managing perfectionism, the importance of breaks/leave/reasonable working hours, managing and talking about money/finance both their own and that of the clients).’*

*‘Supports for Resilience, Mental Health, and Well-being must be prioritised in veterinary education and veterinary medicine institutions must demonstrate that students are afforded appropriate training and support in the realm of professional resilience, mental health, and well-being as part of their education and training to becoming qualified veterinary practitioners.’*

**Recommendation 7:**  
**Veterinary schools continue to create space in the curriculum for professional skills development and conversations on well-being and self-care. Interventions should be evaluated, and results shared across the veterinary education community and the wider profession.**





## 4.4 Tracking in the undergraduate curriculum

Tracking allows increased student choice within the curriculum so students can decide earlier what area of the profession they wish to work in or focus on [51, 52]. Calls for more flexibility within curricula to permit greater student choice, possibly linked to limited licensure, have been around for over 20 years [53]. In 2017, an entire issue of the Journal of Veterinary Medical Education (JVME) was devoted to curriculum review. Recently, 24 per cent of institutions responding to a survey indicated they had a degree of tracking in the preclinical curriculum [42].

Research carried out at the University of California, Davis (UC Davis) on track selection showed that background experience before admission to vet school was the most significant factor in choosing tracks, with the conclusion that pre-application exposure, particularly for less popular tracks/career options, would be valuable [51]. An extensive stakeholder survey in the UK concluded that there was strong support for partial tracking, i.e. the ability to focus on certain species or areas in the curriculum, but not to the extent that limited licensure would be required [54, 55]. Although this study is now almost ten years old, the stakeholder consultation conducted during this review suggests that view still prevails, albeit with evidence of polarisation of views as exemplified below.

### Anti-tracking

*'We wouldn't support the idea of specialities (like livestock) being covered separately to the base veterinary science degree (e.g., as postgraduate options). This approach would likely reduce the number of veterinary graduates interested in a career in the poultry industry (and potentially other production animal species too).'*

*'Streaming would be a disaster for regional practices trying to attract staff. Many mixed practitioners, such as myself, came from a city background, and during my undergrad studies, I developed a passion for cattle work.'*

*'The number of emergency and after-hours centres available to rural clients is diminishing, which means these vets need to have the ability to be omniscient. Even peri-urban small animal practices routinely see pet chickens/goats etc.'*

*'A crucial requirement is that graduates retain the core skills to assist ANZ with emergencies and biosecurity outbreaks, regardless of the species involved.'*

### Pro – tracking

*'I am the owner of a companion animal-only clinic, so I would be perfectly happy to have a new graduate that has never set hands on a cow, for example.'*

*'I would prefer to look again at the model of a 3-year general veterinary training followed by two years where students could choose between two or more options for tracking.'*

*'Modularisation should be divided into two streams, 'mixed' and small animal, which may contain specialities.'*

Given the current tracking in some US schools, staff felt we could offer greater search whilst meeting accreditation standards and the profession's needs.

Any model of tracking ideally needs to take place in a context where there is ample opportunity for continuing professional development and postgraduate training (see sections 7.5 and 8.2) to permit later career changes due to changing preferences or personal circumstances. This fits well with a model of baseline competency across the species but opportunity within the curriculum for student choice in preparation for their chosen career. This model is already well embedded in many veterinary schools globally.

*'At graduation, every student will have completed core weeks in all species (low level of omniscient), AND every student will have completed additional weeks in their preferred discipline areas. By graduation, every student should have developed skills and experience well more than the omniscient baseline standard (in their tracking discipline areas). We assume they will be moving into jobs related to those discipline areas.'*

*'This needs to be coupled with opportunities for re-skilling post-graduation (part of the lifelong learning development) for people wishing to either develop skills in an already preferred area or to change job activities.'*

Tracking models include those with 50 per cent or more of the final year open to student choice, e.g. in small animal, production, equine, mixed, zoo and wildlife or other student choices. In schools with more extensive student choice, such as UC Davis, tracking options begin in the 3rd year of their 4-year curriculum. As a further example, the University of Utrecht offers tracking (companion animal, farm animal or equine) from the 4th year of their 6-year program, structured as a 3-year Bachelor program followed by a 3-year Master's program. The Master's program consists of the Uniform Major, the Differentiated Major and an elective phase. In the Uniform Major, all students participate in the same program to provide students with applied knowledge, understanding and skills in their non-track species. In the Differentiated Major, students choose one of three tracks – Companion Animal Medicine, Farm Animal and Veterinary Public Health, or Equine Medicine. Part of the Differentiated Major is an extra-mural clerkship in a veterinary clinical practice related to the chosen animal species track, which lasts at least eight weeks.

The Panel supports these models, believing that graduates with minimum 'entry-level' competencies may encounter more stress, negative client experiences and patient outcomes than graduates with more opportunity to consolidate their skills in a narrower field. The latter may also feel more positively about themselves and their place as valued and useful members of the clinic team and be less vulnerable to the detrimental effects of being hired by a practice that does not offer effective supervision/support of new graduates.



In addition, they may be better positioned to negotiate higher remuneration because their proficiency would deliver higher 'chargeable hours' for their employer and a greater capacity to pay competitive salaries. All of these benefits may help with retention in the workforce, provided employers play their part in creating a positive workplace culture. The panel does not believe tracking will compromise the capacity for response in the face of exotic disease outbreaks if other recommendations concerning capacity building in rural veterinary practice are addressed. Furthermore, submissions to the review also supported the view that additional postgraduate training is already necessary to address this need.

*'Many urban practitioners probably require updated training to undertake 'nonurban' emergency animal disease (EAD) duties.'*

*'Many veterinarians working outside the agricultural field would have suitable skills and abilities to assist in a response with appropriate induction and just-in-time training.'*

Lastly, as noted by others, students, in general, appear to make good choices of programs of study as they are well placed to make decisions about their own abilities and interests and what they will enjoy and benefit from studying [22]. Notably, in a submission by NZVA, recent graduates stated they and their classmates were confident by the fourth year of their studies in the career direction they wanted to focus on. This, of course, does not mean that all students will stay in their initially chosen career path, but many will. As such, veterinary schools must balance allowing students the benefits of an early career focus without unduly constraining their opportunities to change paths in the future.

Such changes will need careful thought as to the levels of tracking to be introduced at different stages of the course while meeting accreditation standards and permitting future career changes.

**Recommendation 8:**

**Veterinary schools progressively expand the proportion of the curriculum devoted to 'tracking' to produce new graduates with a higher level of proficiency (including technical skills) in their chosen early-career paths.**

**Recommendation 9:**

**AVBC/VSAAC continue to review the extent to which their accreditation standards permit increased tracking.**



## 4.5 Outsourcing (or 'distributed') clinical teaching

A key structural consideration for schools is whether to have their own veterinary teaching hospital to provide core clinical experiences; or to establish relationships with partner practices to deliver these clinical experiences – the so-called distributed model [56, 57]. Whether a traditional or distributed model exists, learning outcomes must be similar, as guided by the relevant competency outcomes.

In some distributed models, university faculty are employed in these practices to ensure continuity of experience and appropriate quality assurance, especially concerning assessment and feedback. The distributed model approach is more common with newly established schools. It has some advantages in terms of opportunities for collaboration with the wider profession in the training of students, a theme that emerged from the review process. However, success depends on suitable private veterinary hospitals with sufficient capacity and caseloads to partner with the veterinary school. This is discussed further in section 4.6.

*'Teaching clinics cannot operate on full cost recovery as they have two clients – the customer and the student. One possible solution is to introduce an internship where new graduates operate under supervision and acquire their registration 12 months after graduating with a degree in veterinary science.'*

The high cost of clinical teaching, the difficulty of maintaining adequate staffing and caseload in all veterinary fields, and a relentless drive to provide clinical training relevant to modern-day private practice have led to varying degrees of outsourcing to the private sector and other universities. Fully or near-fully distributed or outsourced clinical teaching models rely on contracting veterinary practices to take students for most clinical rotations rather than maintaining university teaching hospitals. This requires careful relationship management with the contracted practices and accreditation authorities. Unless the full costs of outsourced teaching are met, they can shift unmet costs to the profession. Partial outsourcing has been a successful feature of the NZ veterinary program for over a decade.

There are genuine challenges in reconciling service revenue-oriented private entities with the demands of a mission-driven teaching entity. For example, while there was support for outsourcing some clinical teaching to provide students with deeper and broader modern-day veterinary practice experience or to allow smaller numbers of students to acquire higher expertise in their electives, submitters were less supportive of a fully distributed model, especially for small animal practice, arguing that the first hesitant steps of students into clinical practice are best made in a teaching-focussed rather than client-focused environment.

Busy practitioners found it difficult to balance their clients' responsibilities with those of their students.

Students without good animal handling experience, client communication skills and a professional manner were difficult to manage in a private practice setting.

Some international students posed language and cultural challenges, and some practitioners were not enthusiastic about teaching students who might not practise in Australasia. Both domestic and international students were concerned at the personal and financial costs of being sent all around the state or country for their training – disruptive to their personal relationships, accommodation arrangements, and part-time employment opportunities, with burdensome extra travel and living costs at off-campus locations on top of already high costs of study.

The Australian Veterinary Association and employers were also clear that the funding of outsourced teaching should be sufficient to meet the costs incurred by private teaching practices to ensure sustainable contracted education. In some cases, central or state governments could be approached to provide direct funding to practices for high-quality outsourced clinical (and pathology) teaching experiences in national or state priority areas. Importantly, this allows governments to influence graduate destinations and meet other government priorities directly. For example, supporting the viability of rural veterinary practices through providing teaching revenue could help ensure the preservation of biosecurity and animal welfare services in rural communities. This approach is already used successfully to support medical, dental and health care in rural Australia (the Rural Health Multidisciplinary Training Program) [58] and is discussed more fully below (section 7.3).

### **Veterinary apprenticeships**

An alternative or supplementary approach may be for the profession to consider a veterinary 'apprenticeship' system to augment traditional on-campus veterinary education. Apprenticeship training models previously played an important role in the professions, with a senior mentor imparting skills and knowledge to their trainee. In modern professional apprenticeship models, students undertake supervised employment in a practice setting with the theoretical aspects of their education gained by self-directed learning and participating in coursework delivered flexibly by the degree-granting institution. This approach is most likely to be suitable for large employers with the necessary depth of supervisory capacity and breadth of caseload.

For example, Medical Doctor Degree Internships will soon be offered in the UK [59]. These apprenticeships allow NHS organisations to grow their future medical workforce with a particular focus on broadening diversity. Apprenticeships also reduce the opportunity costs of study because the students are employed throughout their education and meet some of their educational expenses.



**Recommendation 10:**  
Veterinary professional associations, AVBC, and schools explore veterinary apprenticeship models relevant to Australasia and the cost-sharing options that might facilitate them.

#### 4.6 The research/teaching nexus – changing labour models

Research-enriched teaching has defined university-level learning since the early 19th century. This 'research-teaching nexus' is enshrined in statutes in several countries. For example, the NZ Education and Training Act (2020) lists key characteristics of universities as meeting international standards of research and teaching, having closely interdependent study and teaching; and having most of their teaching done by people who are active in advancing learning. Australia has similar provisions enshrined under its *Tertiary Education Quality and Standards Act 2011*.

Due to this historical and statutory context, a significant number of the teaching staff of veterinary schools are research-active academic staff who are at the forefront of their disciplines and ensure students benefit from cutting-edge knowledge. Their expertise in research methodology and critical thinking (usually honed via their doctoral-level education) ensures veterinary programs are strongly evidence-based. In addition, as befits their role as 'modern-day explorers', many of these staff have a curiosity and enthusiasm for their subject that enriches their teaching and inspires their students. Veterinary students must complete at least one research project, giving them essential experience in evaluating data to develop evidence-based conclusions.

Some submitters noted a global and Australasian academic teaching and research veterinarians shortage. Providing research opportunities is also important for recruiting leading staff and research-postgraduate students to veterinary schools in Australasia. For these staff and students, research gives them a chance to have far-reaching impacts on animal health and welfare, public health and societal prosperity. As such, the opportunity to undertake high-quality research is highly motivating.

However, there are many reasons for changing the traditional research-led teaching model:

- It is expensive. Research-active staff usually spend 40 per cent or more of their time pursuing research activities. There are comparatively few full-cost-recovery veterinary research opportunities, so most labour and indirect costs of veterinary research must be cross-subsidised from teaching revenue. As well, high-impact researchers increasingly undertake mission-led, multidisciplinary research in large programs and often rely on costly equipment and facilities and specialist technical support;

- Change is needed to safeguard staff well-being. The pressure on staff has increased in line with the growing demands of today's large-scale, multidisciplinary research programs and the heightened expectations of students, parents, clients, universities, regulators, and governments. Notably, staff must now devote significantly more time to student well-being issues and highly individualised teaching and student advising stemming from a combination of online delivery methods, emails and social media, and the heightened expectations of today's fee-paying students. The often-competing demands on staff are felt most keenly by those with a broad range of duties, such as those undertaking both research and teaching or, even more challenging, research, education and clinical service;
- There is a pressing need to accelerate teaching innovation in a time of rapid digital and blended learning advances; and
- Universities desire to maintain a curriculum relevant to employers – balancing the employment readiness of new graduates with the knowledge and skills underpinning career-long employability. In this context, teaching by practising professionals is highly valued because it imbues the curriculum with relevance to modern practice. Veterinary science is no exception to this trend, with both specialist-level and general practitioners making significant contributions to the education of veterinary students. Unfortunately, veterinary schools can only afford to teach some specialist areas of the curriculum by contracting veterinary specialists from private practice.

Consequently, most veterinary schools are already incorporating a more diverse set of career pathways into their programs:

- Part-time and fixed-term roles (including contractors rather than employees);
- Teaching-intensive pathways;
- Research-intensive pathways;
- Clinical service-teaching roles; and
- Non-academic teaching roles (e.g., teaching technicians, learning facilitators, instructional designers etc.).

These newer career paths remain contentious, and submitters identified several pros and cons:

- They require considerable leadership and management expertise to meld into unified teaching, research and clinical teams that expertly deliver the diverse outcomes expected of world-class veterinary schools;
- They offer the potential for a more cost-effective teaching labour model and need not negatively impact institutional research productivity;
- They need to steadily improve university-wide human resource processes to support the various career paths (such as clearly defined promotion criteria);
- Some staff were motivated by the ability to play to their strengths. Still, others preferred the wide diversity of the traditional academic role – particularly the opportunity to conduct research and teaching; and
- The teaching-intensive pathways were seen as an advantage in student-centred learning, teaching and online delivery, teaching innovation, and student pastoral care.



Opinions vary on whether the approach strengthens or detracts from schools' research (although the evidence suggests the former if teaching-intensive roles are carefully balanced with research-intensive and research-led teaching roles). Staff focused on research are better positioned to succeed in competitive research funding rounds and to deliver high-impact research programs on behalf of the school.

The ability to flexibly tailor the staffing of teaching teams with part-time and full-time roles, research-teaching and teaching-intensive roles, and non-academic teaching roles was seen as an important way to improve the cost-effectiveness of teaching. In addition, the non-academic teaching staff contribute in many ways. These include assisting in skills development in practical classes, designing online learning content and delivery, and facilitating problem-based and student-led learning pedagogies.

Non-academic management roles have expanded in areas such as operations management and the leadership of specialist services such as continuing professional development, philanthropy and digital learning service – although increasingly, many of these roles are centralised in universities.

The two main impediments to the wider adoption of a greater diversity of roles in veterinary schools were concerns that accreditation standards (specifically the defined student: staff ratios) would be breached and that the human resource practices and collective employment agreements of some universities were not yet sufficiently flexible to accommodate the full variety of career paths.

The Panel believes that role diversity within veterinary schools offers significant advantages and should be carefully considered within each specific school's particular strategic context and operating environment.

**Recommendation 11:**  
Veterinary schools continue to incorporate a more diverse set of career pathways into their structures.

#### Collaboration in curriculum delivery and design

Submissions from the profession strongly favoured the engagement of practising veterinarians (including general practitioners, specialists, and government veterinarians) in part-time teaching roles. Submitters felt this would assist with curriculum relevance and inspire veterinary students to consider other career pathways (such as government veterinary work). In addition, some submitters felt practising veterinarians are better placed to teach clinical practice than academics.

The review also highlighted a desire from several contributors for greater collaboration across the profession in curriculum design.

*'I'd love to see the profession more involved in helping shape the curriculum regularly as its easy for xxx to get way off topic or spend much of the curriculum on largely irrelevant fields.'*

*'Many vets out in practice/government/pharmaceuticals/industry could be more involved in educating veterinary students.'*

*'The profession would like to play a greater role at the university level in developing educational strategy and quality assurance processes related to outcomes.'*

Universities strive to maintain a curriculum that is relevant to employers. In this context, teaching by practising professionals is highly valued because it imbues the curriculum with relevance to modern practice. Consequently, most veterinary schools already incorporate more diverse career pathways into their programs than just the traditional research-active academic pathway. Outsourcing clinical teaching is another way the profession contributes to curriculum delivery, as is participation in the normal processes veterinary schools undertake to hone the desired learning outcomes their curricula are designed to achieve.

However, teaching is a skilled and demanding profession in and of itself. Students expect tutors and lecturers to be current with their fields, deliver content with a strong evidence base in an engaging manner, and be interested in their well-being. University teachers are held to account by regular teaching quality reviews and are expected to show how they have improved their teaching practice and adopted modern teaching pedagogies. They are involved not just in teaching delivery but also in curriculum design to achieve expected learning outcomes. Assessment of learning and student pastoral care are also key roles. And, of course, they are expected to teach all students well, whether or not they are enthusiastic about their learning.

**Recommendation 12:**  
Veterinary schools continue to explore further opportunities for explicit constructive and effective collaboration with the wider profession concerning the curriculum and transition to the profession.





## 5. STRATEGIC STRUCTURAL REFORM FOR FINANCIAL SUSTAINABILITY

### 5.1 Higher education funding changes

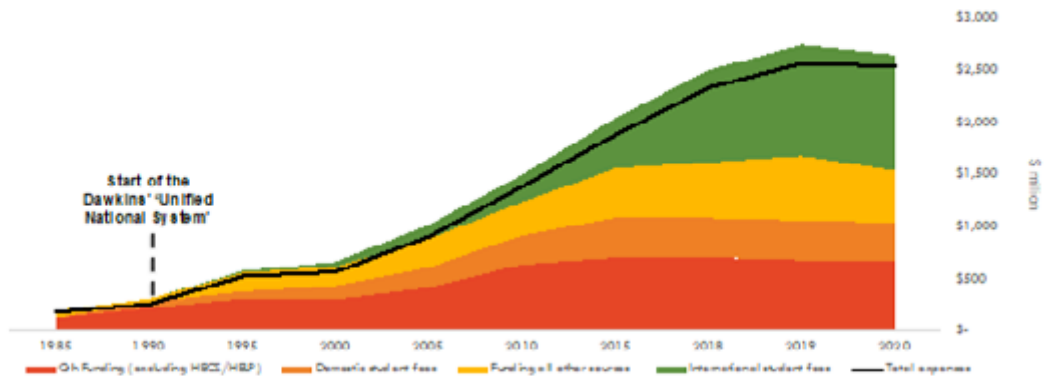
Australian higher education has progressively moved since 1989 from a system almost entirely funded by the Commonwealth Government to a much larger system with multiple sources of funds. Key changes have been the introduction of domestic student fee loans through the Higher Education Contribution Scheme (HECS) with a 'Relative Funding Model' prescribing Commonwealth and student amounts to be paid and the opening up of international education via full fee-paying students.

Notably, the Commonwealth Government contribution has declined slightly in absolute terms since 2010, indicating a much larger reduction in real terms due to inflation. For example, Figure 4 shows how the University of Sydney's total funding mix has changed over the 35 years from 1985 to 2020. The huge reliance on international student fees in recent years is evident. Other sources of revenue have included service contracts (especially research services), intellectual property, and philanthropy.

Figure 4. Total funding of the University of Sydney by source, 1985 – 2020

**Go8 case study. Since the Dawkins' reforms, the University of Sydney's funding mix has transitioned away from Commonwealth sources**

University of Sydney income v total expenses, 1985-2020 (\$ m).



Source, University of Sydney Annual Reports  
The University of Sydney

Source: University of Sydney annual reports

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## 5.2 Funding shortfall for veterinary students

The New Zealand tertiary education system has undergone similar changes to Australia's. The central government controls the level of both government tuition subsidy rates and student fees, along with the number of domestic students that can be enrolled at each university. In addition, enrolment caps are set on some academic programs, such as Veterinary Science and Medicine. As in Australia, annual cost adjustments to government tuition subsidies have not kept pace with rising university costs, resulting in intense pressure on universities to find alternative sources of income to meet their expenses. Full fee-paying international students have also become important to New Zealand universities (for financial and non-financial reasons), but less so than for Australian universities. Other sources of revenue have included domestic student fees, service contracts (especially research services), intellectual property, and philanthropy.

The modern-day reliance of universities on student fees has been associated with a change in student and graduate expectations. Student interest in the relevance of the curriculum to their employment readiness has increased, as have their expectations regarding teaching quality and the accessibility of their lecturers. During their studies, most students accumulate significant debt. Unsurprisingly, they look to recover this debt and the other costs of study (including the opportunity costs of increasingly long programs of study) from their employers through higher salaries.

Employers do not directly fund Australasian universities. However, employers provide highly valued experiential learning opportunities to university students and must now meet the salary 'premium' required to recruit debt-laden students. In addition, employers indirectly support public universities through corporate taxes, employees' payroll, and customers' sales taxes.

For most Australasian veterinary schools, there remains a substantial gap between the total funding received for each enrolled domestic veterinary student and the cost of educating them. Australian Veterinary Science students are in the highest Commonwealth Grant Scheme (CGS) funding cluster with Agriculture, Medicine, Dentistry and Pathology. Domestic veterinary student fees are also in the second highest student contribution band (\$11,800 p.a. for Commonwealth-supported students commencing in 2023). Despite this, the funding per veterinary student from government grants and domestic student fees covers only around two-thirds of the total delivery cost per student.

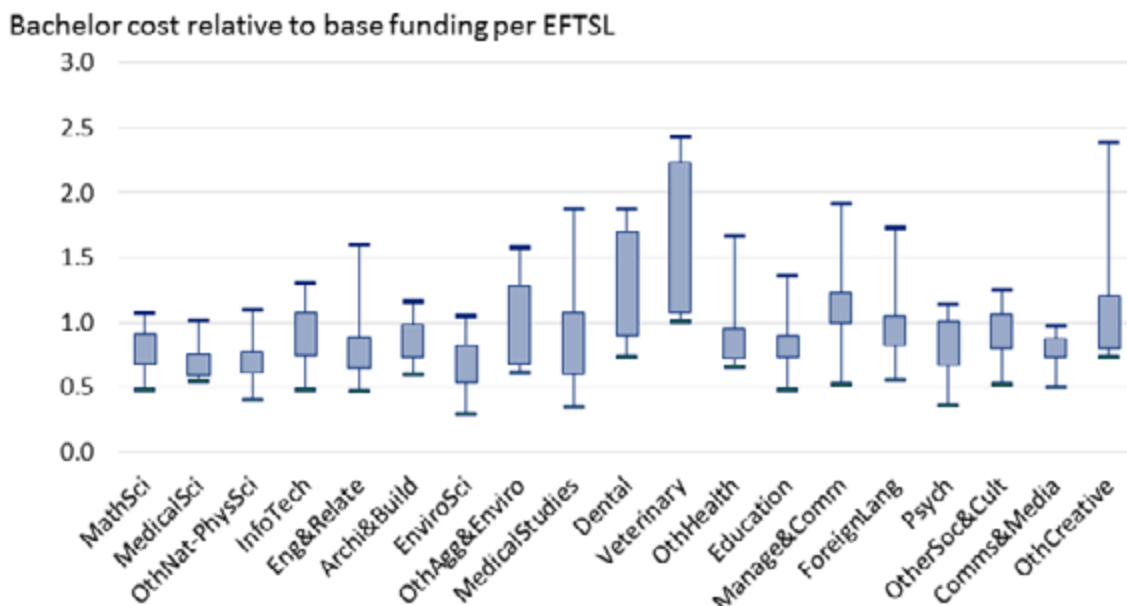
The 'transparent costing exercise' conducted for the Australian Government by Deloitte in 2019 [60] showed that in 2018, the average cost to deliver the veterinary undergraduate course per EFTSL was 148 per cent of the funding received by the university from government and student fees for each domestic student (Figure 5). This underpayment rate has been observed in previous studies.

The cost-to-funding ratio decreased slightly in 2019-20 from 148 per cent to 135 per cent – a fall most likely due to the COVID-19 pandemic-related under-expenditure and likely to be temporary.

In New Zealand, veterinary science is funded significantly less per EFTS than dentistry and medicine. Massey University also recognises a significant gap between funding and the cost of delivery of veterinary science.

**Figure 5.** Cost to funding ratio per EFTSL of different bachelor courses across Australia

Cost/funding relativity at 19 field of education level (Bachelor level, outliers removed)





Australasian veterinary schools have for many years been actively considering various structural reforms to improve their financial stability while, at the same time, protecting staff and student well-being and enhancing their teaching and research programs. Beyond university-imposed budget restrictions and altered labour models (see section 4.6 above), there are many opportunities for structural reform to enhance the financial sustainability of Australasian veterinary schools. Many of these reforms are already being fully or partially implemented in some ways. However, they have different strengths and weaknesses regarding teaching, research quality, relevance, and impact.

However, there was a strong consensus amongst the heads of schools that things cannot continue as they are and that the opportunities for incremental change are now largely exhausted. Put simply; the schools are at a tipping point.

### 5.3 Responding to university-wide strategies to manage cost pressures

The funding challenges experienced by Australasian universities over the last few decades have led to revenue diversification. The ongoing pressures to develop innovative and agile revenue diversification strategies to achieve financial sustainability are detailed in a recent KPMG report [61]. This has been accompanied by unrelenting pressure on cost-effectiveness to deliver equal or better outcomes for less and ensure universities live within their means.

#### Universal budget cuts

The main way universities have managed cost pressures is to impose budget restrictions on all faculties/colleges (including their schools) to align their revenue and expenditure more closely. However, faculties vary in their ability to reduce their costs given variations in ratios of fixed to variable costs and external factors such as accreditation requirements – a particularly significant issue for veterinary schools given the high fixed costs of the teaching of mandatory practical skills to small groups of students across a wide array of species and subject areas (see section 2.3).

When considered appropriate, university management may, for a period, cross-subsidise financially underperforming faculties with revenue from the better-performing faculties. This cross-subsidy is often applied by varying the faculty's financial contribution to funding central university shared services (e.g., libraries, student services, student health, academic advising, facilities management, IT, human resources etc.).

However, even with these cross-subsidies, the gap between costs and funding per veterinary student is so great that it is practically impossible for veterinary schools to bring their costs down sufficiently to live within their total funding per student. As a result, veterinary schools struggle to meet the direct costs of their teaching and research activities (e.g. staff salaries, contracted services, consumables etc.), fall short of expected contributions to university-wide shared expenses, and have difficulty retaining and replacing staff, maintaining clinical services and undertaking capital developments.

The Panel heard that this combination of high fixed costs and inadequate funding means that most veterinary schools in Australasia rely on cross-subsidisation at the expense of other faculties. As a result, their viability depends on institutional patronage, which is unsustainable in the long term. Moreover, it creates inter-faculty resentment and reluctance to approve investment in new positions, facilities, and innovations in those faculties and schools perceived to be a drag on the university.

#### Merging veterinary faculties into larger faculties or colleges

Another way cost pressures are managed centrally is to require mergers of academic groups. The financial goal is to reduce administrative costs by achieving efficiencies of scale within the merged units and streamlining university-wide programs, processes, and services across a smaller number of 'budget units'.

Many universities have undergone major restructures, merging smaller faculties into larger ones. Academic mergers of this type are often not universally welcomed. Although their academic rationale can be sketchy, they offer scale benefits and may facilitate multi-disciplinary teaching and research. Typically, they provoke concerns about difficulties for stakeholders, such as professional associations, navigating the new structure. Perceptions about reduced academic autonomy of (and focus on) the component disciplines of the merged entity often inflame concerns over subsequent cost-saving decisions. Notable examples of such post-merger cost-saving decisions were the demise in 2019 of the internationally-renowned Masters of Veterinary Public Health course at the University of Sydney when its Veterinary Faculty became a School in the Faculty of Science, and more recently, the closure in 2022 of the iconic Werribee Veterinary Teaching Hospital at the University of Melbourne when its veterinary school was moved from the Faculty of Veterinary and Agricultural Sciences to the Faculty of Science [62]. Nevertheless, mergers of this type will likely continue as university managers prioritise reducing administrative costs rather than teaching costs, to meet budget constraints.

The disciplines included in a merged faculty are pivotal to its future direction. For example, merging a veterinary faculty into a biomedical-orientated faculty produces very different opportunities to a merger with an agriculture or science faculty. Suppose larger faculty mergers continue in Australasian universities. In that case, the profession's future contribution in critical areas such as One Health will be better secured if at least some veterinary programs operate in faculties that include biomedical science disciplines, such as the College of Public Health, Medical and Veterinary Sciences at James Cook University.

## 5.4 Changing educational delivery modes

In recent years, Australasian universities have significantly enhanced their ability to deliver online education and student services. Although many vet schools made innovative use of online learning platforms and tools before 2020, the COVID-19 pandemic accelerated these developments. It allowed one to consider where online approaches may equate to or enhance the face-to-face learning experience [63]. Such approaches must be carefully balanced with collaborative and in-person activities to ensure the benefits of social interaction and the development of communication, collaboration and team working skills essential for the profession are not compromised. Submitters were largely positive about these developments.

*'I condone a more flexible learning environment – to a point.'*

*'Inter-institutional (and international) sharing of expertise via remote access- zoom proved successful in ....covid affected rotations.'*

*'I feel that 'online' lectures could be utilised to acquire the services of the top veterinary specialists/consultants across all the veterinary schools in the nation.'*

*'We will aim to deliver quite a lot of content via online mechanisms so that the face-to-face time is spent having more valuable experiences such as tutorials or smaller group discussions and practical classes.'*

***“If lecture-based components can be delivered cheaply online using all available resources, increased resource input into skills teaching could be the outcome”***

Veterinary schools are increasingly using digital teaching to enrich their campus-based courses and to make them more accessible to students who may not be able to attend lectures. In addition, schools can now offer their courses to a diverse array of off-campus students, including busy adult learners and students from offshore or far-flung rural communities. This delivery mode allows schools to provide educational (and other) support to students in out-rotations, including 'distributed' clinical teaching experiences. As mentioned above, renewed interest in professional 'apprenticeships' has also occurred, in which students are employed during their training while being supported by 'distance education'.

Digital teaching opens opportunities to teach undergraduate, postgraduate and continuing professional development programs with a national reach, which greatly helps to build scale in specialised courses and programs. In addition, it enables expansion into transnational education in which veterinary schools teach international students who remain domiciled in their own country. In transnational programs, the practical elements of educational programs, classroom tutoring, pastoral care and peer-to-peer experiences are delivered through partnerships with local educational providers. Notably, transnational education also exposes Australasian veterinary schools to competition from international online veterinary education providers, including universities with strong global brands. This competition is most noticeable in online veterinary Master's and para-veterinary programs in which a wide array of international options is now available.

The increasing capabilities of veterinary schools in online education also provide resilience in campus closures from disasters, threats and epidemics. They also offer a variety of resource-sharing opportunities (see below).

However, the Panel does not believe that campus-based veterinary schools can be replaced by 'virtual veterinary schools.' The large costs involved in developing and maintaining the delivery of high-quality digital programs are often underestimated. The academic performance of school-leaver students improves with the face-to-face support and encouragement of peers and teachers. In addition, many veterinary subjects require hands-on practical rather than online learning. All universities of any substance wish to develop their students' social skills, creativity and citizenship, and the knowledge and skills of a high-quality professional education. These graduate attributes are difficult to develop without on-campus experience for at least part of a student's education, a point well evidenced during the COVID-19 pandemic. In addition, since most veterinary research cannot be conducted virtually, any consideration of fully 'virtual veterinary schools' must come with the realisation that most research would cease.

## 5.5 Building scale through enrolment growth, partnering, mergers, or diversification

Increasing scale increases the number of graduates entering the profession and the number of research-active academic staff employed to advance knowledge. More research at scale benefits future generations, improves research quality and relevance, and builds the school's international reputation. This creates a virtuous cycle in the school's ability to attract top staff, highly able students, large-scale philanthropy, collaborations with highly ranked institutions, and to compete successfully in the global online education market.

Teaching at scale also has many financial advantages. Large classes are more efficient to teach than smaller classes unless these efficiency gains are prevented by fixed staff: student ratios imposed by accrediting bodies. Utilising lecture theatres, laboratories, and high-cost capital equipment improves with larger class sizes, as fixed costs as a proportion of total expenses are reduced. The cost per graduate reduces, and the improved earnings provide the school (and its university) more resilience and financial flexibility in the face of downturns.

### Enrolling more students

For the above reasons, most schools have attempted to build scale by enrolling more domestic or international veterinary students. However, there are constraints to this approach, including workforce demand and the capacity of veterinary schools to provide enough facilities, animal resources, clinical caseloads and specialised staff for either in-house or outsourced practical training. Large class sizes also generate teaching and learning challenges and risks to pastoral care.

### Partnering or merging schools from different universities

Another approach to building scale is the partnering or merger of schools. Expensive academic programs, such as veterinary science, can drain smaller universities' financial and other resources. As a result, models exist internationally where veterinary schools are operated jointly by two universities, leveraging the strengths of each university alongside the benefits of scale. Two examples of this approach are the Harper and Keele Veterinary School (a joint initiative of Harper Adams University and the University of Keele) and the Aberystwyth School of Veterinary Science, which Aberystwyth University and the Royal Veterinary College jointly host.

These UK examples may not apply to Australasia due to the 'tyranny of distance,' although this could be overcome to some extent by the growing digital education capacity of veterinary schools mentioned above.

### Diversification

The scale of a veterinary school can also be increased by diversification of the academic offering, typically by expanding postgraduate veterinary education via for-credit qualifications (e.g., Master's degrees, micro-credentials etc.) and not-for-credit (i.e. continuing professional development) courses.

Postgraduate education makes a valuable contribution to a vibrant veterinary profession, but the small size of many postgraduate classes compromises their viability unless online and campus-based options are offered.

Another approach to diversification is for veterinary schools to teach cognate undergraduate programs such as animal science, biomedical science, and veterinary nursing. Unfortunately, financial and organisational cultural disincentives often impede such inter-faculty teaching.





## 5.6 Resource sharing between veterinary schools

Resource sharing aims to reduce the costs of individual schools by apportioning costs across several entities, improving resource utilisation and financial sustainability. This may occur with other schools/programs within the same university; other veterinary schools; and organisations with overlapping interests with veterinary schools (e.g., veterinary practices, clinical pathology companies, research organisations, government departments, private training providers etc.). The partnering models underpinning resource sharing are similarly diverse, from mergers to joint ventures or contract-for-services.

The sharing of generic resources such as standard teaching facilities and 'corporate shared services' (such as HR, payroll, IT, finance, facilities management etc.) between veterinary schools is unlikely to be beneficial. These facilities and services are more cost-effectively centralised in each university or outsourced to corporations that supply such services more widely.

The sharing of veterinary-specific services between veterinary schools is likely more beneficial. Examples include specialised clinical services, clinical facilities, clinical pathology facilities, research facilities, veterinary library resources, and specialised veterinary courses in undergraduate and postgraduate curricula.

The overall teaching costs of veterinary studies in Australasia can likely be reduced somewhat by effective resource-sharing since:

- Schools and universities vary markedly in underlying cost structures, such as labour and space costs;
- The schools (and their universities) have different strategic advantages (and disadvantages) derived from their locations, variations in vision and strategy, organisational culture and structure, prior innovations, balance sheets, physical facilities, clinical resources, and external partnerships;
- Scaling efficiencies through better utilisation of specialised resources is feasible; and
- Heads of schools showed strong enthusiasm to collaborate, and submitters identified several promising resource-sharing opportunities.

The resource-sharing opportunities link closely to considering options for tracking in the curriculum (section 4.4) and outsourcing clinical teaching (section 4.5). Better management and coordination of these can strengthen Australasia's overall system for veterinary education and research into the future.

A high proportion of the costs of veterinary programs are incurred during clinical training – whereas the earlier years of education are financially sustainable. As a result, an early priority for veterinary schools is to carefully consider how they can share clinical teaching resources to reduce the overall teaching costs and share the cost reductions achieved equitably among the university partners. While this is unlikely to result in clinical teaching generating a financial surplus, it can result in reduced losses.

Some options for resource sharing mentioned by submitters included:

- Contract-teaching in particular fields of clinical study;
- Co-appointment of specialised staffing resources;
- Co-teaching of digitally-enabled courses; and
- Shared use of physical and digital facilities (including animal facilities, library resources and clinical simulation suites).

Resource sharing is also usually beneficial to research because:

- It widens access to high-cost, specialised physical facilities (such as infectious disease containment laboratories) and expensive equipment; and
- Higher utilisation rates improve the affordability of specialised technical help to operate the equipment and enhance the prospects of replacing specialised facilities and equipment when needed.

Resource sharing that can unlock achievable cost savings requires an agreed system-wide strategy for veterinary teaching, identifying the specialised areas of teaching and research that each veterinary school is prepared to contribute to creating a diverse ecosystem of veterinary education in Australasia.

Obstacles cited included:

- Accreditation standards that were perceived as impeding resource sharing;
- Difficulties in splitting EFTSL revenue;
- Complicated multi-institutional academic approval, assessment and quality assurance processes;
- Cross-crediting challenges;
- Varying human resource policies;
- Software licencing restrictions;
- Differences in institutional cultures; and
- The financial and non-financial difficulties imposed on students by studying in different parts of the country.

## 5.7 Strategic change fund

Many opportunities exist for structural reform of veterinary education. Most of the structural reforms discussed above have already been implemented or partially implemented by some schools. Still, the level of uptake varies, partly because of different degrees of applicability to each particular school and partly because of a lack of 'bandwidth' to operationalise significant structural change.

Accordingly, it is difficult for the Panel to make specific recommendations about the opportunities for reform. Instead, we encourage adopting the reforms that best fit with the specific strategic context and operating environment of individual schools. Each school must continue to examine these possibilities in their particular strategic context and operating environment.

**Recommendation 13:**  
Each veterinary school consider the 'fit' of structural reform opportunities identified in this report with its particular strategic context and operating environment.

The Panel heard (and agrees) that many obstacles identified to resource-sharing between veterinary schools can be overcome. However, a search for productive and possibly transformative synergies is best carried out collaboratively between all Australasian veterinary schools. In particular, strategies and opportunities for developing tracking options and managing the cost pressures of providing effective core and elective clinical training should be identified and explored with relevant stakeholders. In addition, strategies for developing complementary centres of excellence for postgraduate teaching and research (see Section 8.2) should be concurrently investigated.

Timely progress will require the establishment of a strategic-change fund to support a pan-university project team to develop a series of business cases outlining the specifics of the proposed resource-sharing models for the approval of university leadership.

It is difficult for the Panel to be precise about the cash or in-kind investment required in the proposed strategic change fund. Still, we envisage that, at a minimum, all eight universities would need to contribute the time of at least one staff member with relevant project management expertise for one year – as well as a modest budget for non-salary operating costs. Ideally, enough funds would be provided to appoint a mutually agreed dedicated project staff member who would work under the direction of VSANZ.

**Recommendation 14:**  
All eight universities with veterinary schools jointly contribute to a shared strategic-change fund to unlock effective veterinary school, resource-sharing models.







## 6. INCREASING GOVERNMENT SUPPORT FOR VETERINARY EDUCATION

### 6.1 Threats to nationally critical veterinary education capacity

The Panel heard compelling evidence, compatible with the Deloitte costing exercises mentioned above [60], from vice-chancellors and the heads of the veterinary schools that most (if not all) of the veterinary schools in Australasia are financially unsustainable and that universities are being forced to make cost-saving decisions that knowingly degrade nationally critical institutional veterinary capacity.

*'I am one of the longest-standing deans amongst the Australasian schools. It has been a somewhat sobering realisation for me that my tenure will be marked by the systematic degradation of the institutional veterinary capacity built by those who have gone before me. At best, I can hope that the degradation has been strategic, targeted and reasonable, but already it has undermined national expertise.'*

The cost savings have included staff cutbacks, reduced investment in teaching and research programs, and deferred maintenance. Teaching hospitals are encouraged to shift focus from teaching students to providing financially viable services to clients or are privatised (e.g. the recent changes at the Werribee animal hospital facility [64]).

Because most veterinary schools in Australasia rely on cross-subsidisation at the expense of other faculties, their viability depends on institutional patronage. To a greater or lesser extent, they experience on-campus resentment and a reluctance to invest in the school. At least one veterinary school is in a comparatively precarious position given the reduced financial wherewithal of the university to continue cross-subsidisation. In this case, the university's capacity to continue supporting the financial drain of programs like Veterinary Science has been severely curtailed by economic challenges resulting from the COVID-19 pandemic.

The ongoing willingness of universities to cross-subsidise veterinary schools cannot be taken for granted. A fundamental duty of university leaders is to protect the sustainability of their university for future generations. Therefore, cross-subsidisation of veterinary schools will continue only to the degree financial resources allow and only if the veterinary school contributes more to the university and wider society than other areas of study that would benefit from additional financial support.



## 6.2 Increasing government grants per veterinary student EFTSL

As discussed above, Veterinary Science remains the most expensive university program to deliver in Australasia (see section 3.2). In addition, it has the highest funding shortfall (see section 5.2), with universities receiving sufficient funding from government grants and domestic student fees to cover only around two-thirds of the total delivery costs per student. This deficit requires cross-subsidisation from other parts of the university and is not sustainable in the long term.

Since 2021, Commonwealth Grant Scheme (CGS) funding for domestic students has been arranged in four Commonwealth contribution clusters and student contribution bands, with Veterinary Science in the highest Commonwealth cluster together with Agriculture, Medicine, Dentistry and Pathology (Table 4) [65]. For students commencing in 2023, this cluster receives a standard annual CGS payment of \$28,196 per EFTSL. Veterinary domestic students also contribute at the second highest level of \$11,800 p.a., with most students utilising the income-contingent HECS-HELP scheme to cover these amounts. This places veterinary, medical and dentistry students at the highest level of total resourcing, with combined funding of \$39,996 per domestic EFTSL. As noted in section 3.2, the cost of educating veterinary students is far higher than for either Medicine or Dentistry due to the need for far more practical training with different species of animals.

Consequently, the net funding amount per student place remains completely inadequate, with the cost per EFTSL of the total government plus student fee (cost-to-funding ratio) being 148 per cent in 2018, an underpayment rate that had been observed in previous studies. However, the decrease of this ratio to 135 per cent in 2019-20 can be attributed to pandemic-related under-expenditure, which should be temporary.

**Table 4.** Total resourcing for a Commonwealth-supported place by discipline – 2023

Funding cluster 4	Part of the funding cluster	Maximum student contribution amounts	Australian Government contribution	Total resourcing
Agriculture, Medicine, Dentistry, Veterinary Science, Pathology	Agriculture	\$4,124	\$28,196	\$32,230
	Pathology	\$8,301		\$36,497
	Medicine, Dentistry or Veterinary Science	\$11,800		\$39,996

In New Zealand, the Veterinary Science tuition subsidy paid by the government in 2022 was \$32,516 per EFTS, up 10 per cent from 2021 relative to other disciplines but still far less than the tuition subsidy paid to Dentistry and Medicine of \$55,519 and \$45,779, respectively. Domestic student tuition fees for Veterinary Science were approximately \$13,000 per student. Consultation with Massey University identified a similarly significant gap between funding and cost of delivery in New Zealand, with the Tertiary Education Commission confirming that Veterinary Science funding rates are set at a level that requires cross-subsidisation by Massey University.

Universities and their veterinary schools have deployed numerous cost-cutting and efficiency strategies over the last decade without changing this fundamental imbalance. However, it is apparent that the opportunities for incremental change are now largely exhausted and nationally critical institutional veterinary capacity is being degraded. Therefore, there is an urgent need for increased government investment per EFTSL in lockstep with actions to contain the high costs of training by way of regulatory (section 2), curricular (section 4), labour (section 4.7) and structural reform (section 5 and 7). Importantly, even if all the reform opportunities discussed in this report are implemented, it is considered that Veterinary Science education will still require a significantly higher CGS contribution than the other programs in its funding cluster, in part because of its breadth and practical requirements (see section 3.2) and in part because government contribution to veterinary education currently comes almost exclusively through the CGS (in Australia) and tuition subsidy (in New Zealand) without the payment of a clinical training loading.

It will be necessary to increase the funding rate per veterinary EFTSL without disadvantaging other courses and for universities to prioritise this extra funding specifically to support veterinary science programs (e.g. for the operation of veterinary teaching hospitals).

### Recommendation 15:

The Australian Government move quickly to increase the funding rate per veterinary EFTSL by at least 30 per cent – and, where relevant, lift the maximum basic grant funding of universities to accommodate this increase in revenue. The NZ Government should similarly urgently adjust its grant funding for veterinary EFTS by at least 10 per cent per annum over three consecutive years.

### 6.3 Providing a veterinary clinical loading

The high cost of training medical students is recognised by the Australian Government's provision of an extra 'medical student loading' for a designated number of medical students rather than using the demand-driven model for other fields of study. Universities are paid this loading (an extra 5.38 per cent of the Commonwealth Grant per EFTSL) for undergraduate clinical training. There is also a two-year placement salary cost for postgraduate residency that is shared between Commonwealth and states.

An alternative or supplementary measure to manage the high costs of veterinary clinical training may be for governments to designate a specific number of Veterinary Science places and provide loadings similar to that applied to medical students. This measure could target students' large animal clinical training or other clinical teaching placements to address equity or diversity issues.

In addition, the government could directly contract a network of rural practices to undertake veterinary education, akin to the Rural Health Multidisciplinary Training Program (sections 4.5 and 7.3).

**Recommendation 16:**  
Governments consider providing clinical training loadings for a designated number of veterinary students clinical training in priority areas.

### 6.4 International veterinary students

Australasian universities have heavily relied on full-fee-paying international students for decades to cover their funding shortfall for veterinary teaching and research (see section 5.1). However, the border closures and changes to immigration settings associated with the COVID-19 pandemic dramatically curtailed the international programs of the region's veterinary schools, precipitating significant financial hardship. They also required considerable investment in rapidly expanding online delivery and assessment methodologies. The Panel also heard of the important non-financial contributions made by international veterinary students to Australasia. These included bringing awareness of global animal health issues to the classroom and establishing collegial cross-cultural networks that underpin future business and trading relationships.

New Zealand particularly depends on recruiting international veterinarians into roles in the private sector and government workforce. The VCNZ Workforce Report 2018-2019 [20] documented that in 2019 the proportion of international graduates was 30 per cent. However, in the AVA's 2021 Workforce Survey, only 10 per cent of respondents had graduated overseas, mainly from the UK, NZ and South Africa.

The recruitment of international students is a highly competitive endeavour. To ensure Australasian veterinary schools can compete successfully with schools in the UK, Ireland, USA and Europe (and to help meet veterinary workforce needs), favourable immigration settings are essential and in-study and post-study work rights must be internationally competitive.

**Recommendation 17:**  
Australian and NZ Governments continue to facilitate international veterinary student access via favourable immigration settings, competitive in-study and post-study work rights, and a clear pathway to residency





## 7. TRANSITION TO THE WORKFORCE

### 7.1 A profession-wide approach to well-being and healthy work practices

The challenges of transitioning to a fulfilling career and managing mental health risks of veterinary practice have been well recognised globally [66] and by veterinary students for many years.

Some employers suggested that veterinary schools must select for, and teach, resilience so students can 'survive' practice. In contrast, submissions from veterinary educators indicated that selecting applicants on resilience is difficult to do successfully; however, there was agreement that veterinary programs should ensure students have a realistic understanding of what a career in the veterinary profession entails. Evidence on the effectiveness of interventions to support the development of resilience in students is still relatively minimal. However, some studies show encouraging results concerning the impact of focusing on personal resources such as self-compassion and mindfulness strategies [67, 68]. Common stressors for veterinarians identified in recent research studies include low salary, working hours and unhealthy work-life balance [69, 70]. These data were supported by submissions to the review.

*'While some degree of resilience is a valuable asset for an individual, putting the onus solely on an individual to 'be more resilient' is, in my opinion, not helpful in the face of poor workplace conditions, and it would certainly be useful to step away from the idea that an individual needs supreme resilience just to 'survive' practice.'*

*'There are also workplace cultural issues. For example, nights on call followed up by a full day of work (with no break) may see veterinarians working more than 24 hours in a row. This is not done in other professions (e.g. medicine, paramedics, nursing etc.).'*

Similarly, a recent NZ research study on veterinary career trajectories found that workplace experiences and the degree of fit between personal characteristics and aspirations and the workplace environment influenced veterinarians' feelings towards their work and their state of well-being, which in turn affected their career decisions [19]. Other opportunities, professional networks, and non-work factors also played a key role in shaping careers. Encouragingly, the more recently graduated cohort in the study generally had more positive experiences of early career support than the 20-year cohort, indicating a somewhat improved situation.



Numerous aspects of the work environment have been found to affect career decisions, including work-life balance, remuneration, after-hours requirements, working hours, and support available, as well as other aspects of workplace culture [19, 69, 70]. The quality of interactions with employers, clients and colleagues is important, as is the degree of professional stimulation and career progression. The perception of not doing the best for clients or animals resulting from heavy workloads contributes to dissatisfaction. The attitudes of employers and the quality of management are also influential. Conversely, the most cited protective factors were fulfilment and satisfaction, positive work conditions, and supportive colleague relationships.

The Panel received highly variable feedback from new graduates and experienced veterinarians on their workplace experiences. Some described poor workplace experiences that drove them to change or leave the clinical practice altogether. In such circumstances, these individuals seemed not to lack resilience. Instead, they appeared to have decided to find a workplace where they could 'thrive' rather than just 'survive'. In contrast, many other veterinarians spoke glowingly about how supported they felt in their current work and why they wanted to stay. These contrasting experiences left the Panel with a sense that the centrality of positive workplace experiences to successful recruitment and retention was not appreciated by some employers or, perhaps more likely, that positive workplace experiences were very difficult for some employers to maintain given the constraints under which certain veterinary practices operate.

Ensuring veterinarians thrive in practice is not solely the responsibility of veterinary schools. Employers and individual veterinarians need to play their part in creating positive workplace experiences for new graduates and staff. Veterinary associations, too, have an important role in helping their members build positive workplaces. They can assist veterinary practices in improving their leadership and management and hone their business models through continuing professional development, business mentoring, and the provision of self-assessment tools. They can also guide standard approaches to resolving workplace disagreements, including where to get professional advice.

**Recommendation 18:**  
Veterinary professional associations assist employers in taking charge of the workplace issues that affect recruitment, retention, and well-being and in developing their members' business and management experience to help hone veterinary business models.

## 7.2 Mentoring and support of new graduates

Many studies have highlighted the difficulties faced by new graduates in transitioning to the profession and the importance of early mentoring and support. Much has also been published on the mental health, well-being and resiliency challenges during this transition phase [71-73] as an extension of the issues described in the curriculum section above.

The Panel heard that most new graduates receive good support but that the level of support is inconsistent amongst different practices and organisations. It ranges from a 'sink-or-swim' approach to carefully structured graduate induction programs. There was a strong consensus amongst submitters (including boards) that some form of mentoring of new graduates is an essential means of smoothing their passage into the workforce. This call to action was balanced in some respondents by concerns about resourcing and logistics of mentoring and the need for any regulation of this area to be 'light touch'.

*'The transition of new graduates to the veterinary workforce is an area of concern. Many are just thrown in the deep end (like our generation) and expected to cope.'*

*'I'm a massive advocate for much more mentorship and possibly even structured support for new graduate vets.'*

*'In contrast to the human health sector, there is a lack of consistency as to the experience that new graduates have as they transition into their early career. Standardised competency requirements and professional and personal support needed in early career stages to achieve defined goals are absent.'*

*'Invest in staff to become trained and certified mentors and skills trainers.'*

*'The industry needs paid mentors in practice who have a skillset to offer and the training to deliver training to vets.'*

The above views are consistent with VSAAC's assertion that 'New graduates' level of competence is recognised as being at a level where continued veterinary supervision, support, coaching and mentoring and continuing professional development are required to develop the level of proficiency, ease and confidence required for full independence'. The Panel agrees with this and believes that veterinary boards can proactively support good practice and protect the public by ensuring that graduates receive appropriate mentoring.

Although a formal internship program is required for medical graduates, it is not considered practical to have a mandatory one for veterinary graduates, owing to the large variety of workplaces and the financial implications, particularly for smaller practices. In Australasia, some larger corporate and specialist practices and institutional employers have their self-funded internship programs, with internal mentoring, for months or years. In contrast, many (but not all) smaller practice employers provide informal mentoring support.

The UK recently introduced a mandatory Veterinary Graduate Development Program (VetGDP) [74]. Developed after consultation with the UK veterinary professions, the VetGDP recognises that while graduates are qualified vets, structured support in the workplace can help their professional development, reduce anxiety and build lasting confidence. Therefore, new graduates, overseas vets, or those returning to practice after a break of five or more years may only be employed at an RCVS Approved Graduate Development Practice where they are assigned a trained VetGDP Adviser who works on a one-to-one basis with the mentee (for at least one hour per week) to provide structured workplace support, professional development and supervision.

The Panel heard from many submitters on the benefits of the voluntary mentoring programs currently operated by the Veterinary Council of New Zealand (VCNZ), the New Zealand Veterinary Association (NZVA), the Australian Veterinary Association (AVA), and several institutional and corporate veterinary organisations.

- NZVA partners with the VCNZ, Massey University School of Veterinary Science, and the Veterinary Professional Insurance Society to provide NZVET Mentoring Support for new graduates, using a mentoring software platform to match recent graduates with experienced professionals. In addition, VCNZ utilises mandatory continuing professional development requirements to encourage all new graduates to have a supervisor and is currently considering strengthening this approach by requiring a named supervisor.
- In Australia, the AVA Graduate Mentoring Program connects experienced veterinarians with new graduates to receive one-on-one advice and support as they transition into the profession. The program is structured over 12 months, and participation is voluntary.
- Various larger or corporate practice employers also provide internal mentoring or internship programs.

These mentoring programs should be promoted and further developed to ensure that new graduates consistently experience appropriate supervision, support, mentoring and career development. In making this recommendation, the Panel acknowledges there will be financial and time impacts for employers of heightened supervision resources.

**Recommendation 19:**  
Australasian veterinary boards, the AVBC, VSANZ, NZVA and AVA work together to harmonise and promote their graduate mentoring programs and consider making them mandatory.



### 7.3 Government-supported rural veterinary practice networks

The Panel heard that the viability of many rural veterinary practices in Australasia is threatened. Unless practice viability is addressed, graduates will not be attracted to or retained in rural practice, whether or not veterinary schools introduce specific rural veterinary admission pathways and tracks.

In New Zealand, MPI recently announced an intention to establish a Veterinary Network for Biosecurity Preparedness and Response (VetNet Biosecurity+) – a public-private partnership to invigorate the regulatory cooperation under the Veterinarians Act and Biosecurity Act. MPI will work directly with rural private practices with an initial focus on developing biosecurity preparedness and with the potential to further develop this network in other high-priority areas.

The Australian Senate's Rural and Regional Affairs and Transport Committee recently reviewed Australia's biosecurity measures and response preparedness adequacy. They noted particular problems with the availability of rural veterinary practitioners, addressing this in their report 'Adequacy of Australia's biosecurity measures and response preparedness', particularly concerning FMD and varroa mite [75], especially through Recommendations 24 and 25.

*Recommendation 24 (6.89). The rural veterinary profession appears to be in crisis, especially in remote areas. Veterinarians are essential to Australia's biosecurity system – holding key front-line defence roles in monitoring and surveillance, disease detection, EAD preparedness and response and animal welfare. Veterinarians bear significant pressures in any EAD response, and there needs to be sufficient capacity to meet initial and potentially extended response measures. Attracting and retaining rural vets is challenging and complex and will require a coordinated response between government and industry to address shortfalls in the medium-long term.*

*Recommendation 25 (6.90) The committee recommends that the Australian Government work with relevant industry bodies to design and implement measures to improve the capacity and capability of production animal veterinarians, particularly in rural and remote areas, including enhancement of veterinarian attraction and retention strategies and initiatives such as graduate and rural practice incentives; compensation paid to veterinarians in the event of their involvement in an EAD response; and increased utilisation of rural and remote veterinarians in surveillance and monitoring activities.*

These measures will need considerable customisation by state and territory governments due to different private and public models of rural and remote veterinary services in other parts of Australia. Animal Health Australia, with Commonwealth, state / territory governments and livestock industry peak bodies, would be well placed to help with this endeavour.

In Australia and New Zealand, veterinary schools should work with governments (state, territory and national) and with Animal Health Australia to develop complementary roles in upskilling veterinarians for biosecurity and emergency disease preparedness.

**Recommendation 20:**  
**Veterinary schools collaborate with Animal Health Australia and governments in Australia and New Zealand to explore and develop their role in upskilling veterinarians for biosecurity and emergency disease preparedness.**

In keeping with the Senate's recommendations above, the Panel recommends that the Australian government consider directly contracting a network of leading rural veterinary practices to support the nation's biosecurity preparedness and teach livestock clinical practice and government veterinary services on behalf of veterinary schools. As well as improving the viability of rural practices, this approach would significantly augment the rural teaching capacity and relevance of university-based veterinary teaching hospitals. These government-supported rural veterinary teaching practices could play the same role in veterinary education as the public hospital system in medical training. They would utilise similar processes of responsibility and accountability concerning placement, supervision, support, and assessment.

This approach would be analogous to NZ MPI's Veterinary Network for Biosecurity Preparedness and Response (VetNet Biosecurity+) and is already used successfully to support medical, dental and health care in rural Australia (the Rural Health Multidisciplinary Training Program) [58]. This network of high-performing rural practices could support rural veterinary education and inspire young graduates to enter this critically important field of veterinary science.

**Recommendation 21:**  
**Governments consider contracting a network of rural veterinary practices to provide teaching and government services in the regions in collaboration with veterinary schools, including teaching livestock clinical practice and government veterinary services.**



## 7.4 Rural veterinary bonding schemes

The Panel observes that the recruitment and retention of new graduates to rural practice in New Zealand appears to have been assisted by a voluntary bonding system. The New Zealand Voluntary Bonding Scheme for Veterinarians [76] aims to support the retention of veterinarians to respond to livestock-based industry needs and to assist New Zealand in maintaining world-class standards in biosecurity, animal welfare and food safety. MPI administers the Scheme and has supported 416 vet graduates since its inception in 2009 to work in rural communities. Participants are eligible for \$55,000 (before tax) over five years. However, the first instalment of \$33,000 is unavailable until they have completed their third year of employment – providing a strong incentive for graduates to stay in rural practice. The Panel notes that bonding schemes of this type align with Recommendation 25 of the Australian Senate's Rural and Regional Affairs and Transport Committee's review discussed above and with the AVA's call for a HECS debt forgiveness or financial incentive scheme for rural vets [77].

The Australian Government in February 2023 passed legislation to wipe or reduce the student debt of doctors or nurse practitioners who live and work in rural and remote Australia. There is a provision for review, and the ability to extend the Scheme to other sectors of high skills need in rural, remote and very remote Australia, including the health, mental health and education sectors.

### **Recommendation 22:**

**The Australian Government extend to veterinarians the student debt relief provided to doctors and nurse practitioners who live and work in rural and remote Australia via a rural veterinary bonding scheme.**

## 7.5 Continuing professional development

The knowledge required for a full and successful career as a veterinarian cannot be instilled in a 5- or 6-year period of study as an undergraduate. There is too much to learn, and many key lessons require life and professional experience yet to be acquired by students in their late teens and early twenties. Furthermore, what veterinarians need to learn is not defined by their career paths. At each career transition point, intensive periods of professional development are required. For these reasons, continuing professional development (CPD) – the acquisition, maintenance and development of skills and knowledge – is essential to every veterinarian's working career, and different Australasian veterinary boards mandate various requirements. It enhances the standards of professional practice, supports new graduates in their transition to independent and experienced veterinarians and meets the educational needs of veterinarians transitioning between veterinary career paths.

The quality and quantity of CPD courses for veterinarians within most fields of veterinary science appear to be excellent. There is a broad array of providers and many different delivery modes ranging from highly accessible online offerings to traditional two- or three-day, face-to-face conferences targeted at professional development and collegiality.

The Australian and New Zealand College of Veterinary Scientists (ANZCVS) professional development programs and examinations (for Membership and Fellowship) significantly contribute to advancing professional standards. The College was established in 1971, now has over 3,000 members and offers Membership and Fellowship examinations in 34 subjects, with Fellowships leading to registration as a veterinary specialist.

Many for-credit postgraduate academic offerings, such as Master's programs and micro-credentials, are also available. International and local universities offer many of these programs online in Australasia.

Veterinary professional associations, such as the AVA, NZVA and ANZCVS, are well positioned to lead in commissioning, providing, and enabling relevant, career-long professional development. In undertaking this role, veterinary professional associations usually have strong but non-exclusive relationships with veterinary schools, as active partners in the provision of professional development, and with regulatory boards to ensure CPD requirements are met. The AVA and NZVA are also well placed to provide CPD, support and mentoring to assist employers in taking charge of the workplace issues that affect recruitment, retention, and well-being (see section 7.1 above).

### **Recommendation 23:**

**Veterinary professional associations develop a leadership role in continuing professional development for the profession in collaboration with other providers, including veterinary schools.**



## 8. FUTURE VETERINARY RESEARCH AND POSTGRADUATE EDUCATION

### 8.1 Research output of Australasian veterinary schools

As discussed in section 4.6, research-enriched teaching has defined university-level learning since the early 19th century. However, research-led-teaching is expensive, and for this and other reasons, most veterinary schools are incorporating a more diverse set of career pathways into their programs, including research-focussed roles to complement the traditional research-teaching academic role and provide the dedicated research capacity to undertake large-scale, multi-disciplinary research programs.

It was also noted above that providing research opportunities is important for recruiting leading staff and research-postgraduate students to veterinary schools in Australasia. Research offers these staff and students the chance to have far-reaching societal impacts and is highly motivating. Section 4.4 describes the value of ongoing research in veterinary education. In section 6.1, the virtuous cycle created by the impact of high-quality research at scale on the global reputation of veterinary schools was touched upon.

Notably, a global trend is toward increased scholarly outputs in veterinary science (Figure 6) [78].

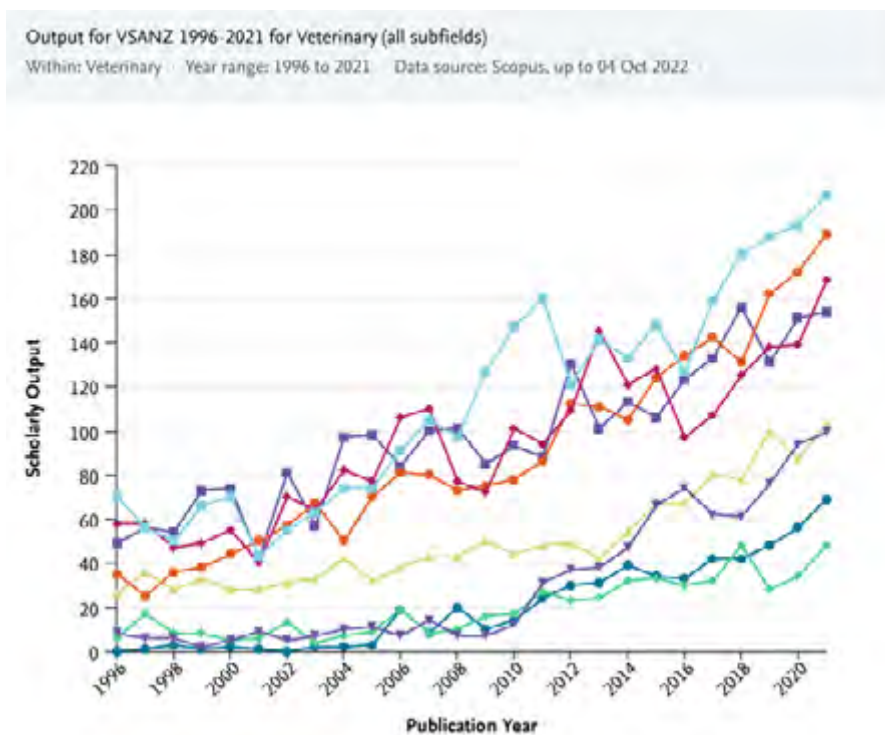
Figure 6. Global veterinary scholarly output



The research programs of Australasian veterinary schools make a significant but modest (3.1 per cent) [78] contribution to these global veterinary research outputs but a very important contribution to veterinary research in Australia and New Zealand. Similarly, the research outputs of the eight Australasian veterinary schools have been steadily growing, with the four most research-intensive schools (Sydney, Melbourne, Queensland and Massey) producing considerably more outputs than the newer, less research-intensive schools (Figure 7) [78].

In general, research from the Australasian veterinary schools is of high quality. Over the last five years, the percentage of their scholarly work published in the top 25 per cent of global journals [79] has ranged from 34.8 per cent in a new school to 49.5 per cent in an established school – with an average of 42.6 per cent compared to a global average of 29.9 per cent [78].

Figure 7. Scholarly output for Australasian veterinary schools  
Schools deidentified





An analysis of their top institutional collaborations (academic, government, corporate, medical, and other) reveals that Australasian veterinary schools overwhelmingly collaborate. However, other important collaborators include the NSW Department of Primary Industries, CSIRO, AgResearch, South Australian Research and Development Institute, Murdoch Children's Research Institute, Royal Melbourne Hospital, Royal Children's Hospital, Dairy NZ, Rivalea Australia Pty, Glaxo Smith Kline, Idexx, Waltham Centre for Pet Nutrition, Merck, DSM Food Specialties, and a small number of local and international universities. Notably, however, international collaborations accounted for only 5-9 per cent of the research outputs of the schools, suggesting international research funding opportunities have proven difficult to access.

The veterinary school research focuses predominantly on animal health, welfare and production, and public health and biosecurity issues that are most important (or unique) to Australasia and its near neighbours. This is illustrated by a snapshot of the ten organisations that have funded most of the veterinary school research outputs. These are the: Australian Research Council, Meat & Livestock Australia, National Health and Medical Research Council, Australian Centre for International Agricultural Research, Rural Industries Research and Development Corporation, Australian Pork, Wellcome Trust, Department of Agriculture, Water and the Environment, NSW Department of Primary Industries, and the Queensland Government [78]. The Panel wishes to emphasise the importance of maintaining and strengthening these locally focused, internationally relevant veterinary research capabilities. Animal health researchers in other countries cannot be expected to understand our farmed and natural ecosystems, our public health challenges, and our indigenous knowledge systems – let alone be able to define the most pressing veterinary research priorities in Australasia. The Panel notes that the financial sustainability of the research-intensive veterinary schools (and that of the newer, less research-intensive schools which aspire to undertake more research) can be improved by more full-cost government and industry investment in the research priorities of the animal and public health sectors. In contrast, additional research funding that does not meet the full cost of the research (i.e. does not pay research overheads as well as direct costs) would be a further damaging drain on the viability of the region's veterinary schools.

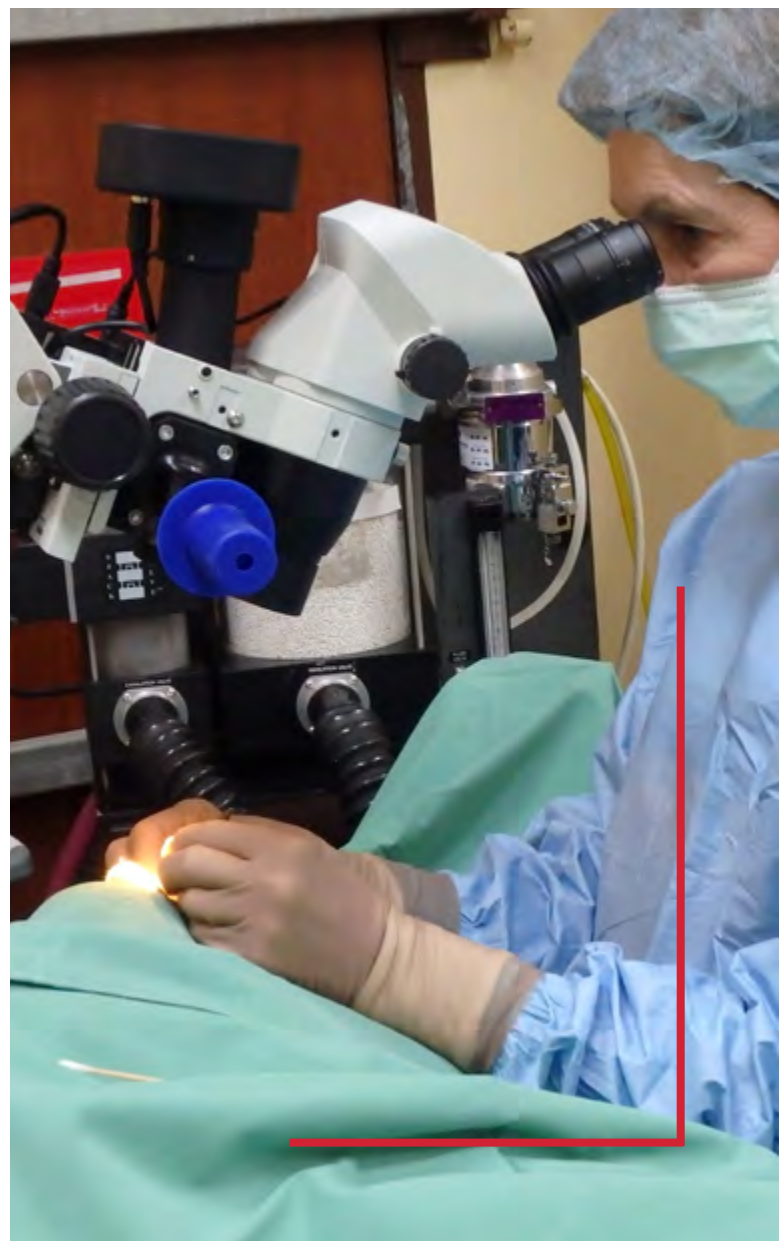
*'Collaborations between veterinary schools and State departments of primary industries/agriculture to build critical mass in education, research, training and knowledge translation.'*

In addition, the Panel was encouraged to hear several examples of current and planned co-locations of government veterinary research institutions with veterinary schools on university campuses. There is strong international and Australasian evidence that co-locations of this type can better leverage the current level of government investment in animal and public health research. They offer the benefits of scale, refresh institutional cultures, facilitate multi-disciplinary collaboration, and allow for flexible use and reuse of the facilities as government research priorities evolve.

However, experience shows that to be successful, co-location must be coupled with active incentivisation by management of collaborative research, sharing of high-capital cost equipment, co-supervision of postgraduate supervision and co-appointments.

In summary, the research programs of Australasian veterinary schools enrich their teaching and make a very important contribution to the high-priority research outcomes underpinning a sustainable future for the citizens of Australia and New Zealand. However, the cross-subsidisation of non-full-cost-recovery research adversely affects veterinary school viability. Co-location opportunities can better leverage the current level of government investment in animal and public health research.

**Recommendation 24:**  
Governments and industry increase the amount of full-cost funding in the research priorities of the animal and public health sectors and encourage the co-location of veterinary schools and government research institutions while actively incentivising collaboration.



## 8.2 Building postgraduate education and research capacity for the future

There are considerable opportunities for the Australasian veterinary schools to provide complementary postgraduate training programs addressing the more specialised needs of the profession and to promote these in an integrated way both in Australia and internationally. However, the need to maintain an ongoing capacity to review and develop new knowledge in many disciplines cannot be applied uniformly by all eight veterinary schools.

In particular, there are growing needs for government and industry veterinarians and many other disciplines to continue learning about and defining their and others' roles in the constantly evolving and complex food security, One Health, Eco-Health and Planetary Health challenges facing us all (see section 1.2).

This offers opportunities for different schools to play to their strengths and avoid duplication of effort and expense, as discussed in section 5.

The structural reform considerations leading to recommendation 14 should also prioritise the development of this complementary R&D framework, looking for mutual/national benefit while avoiding parochial competition and working to overcome the many obstacles to a successful long-term arrangement.

Ideally, this could lead to the creation/identification of a set of centres of excellence around Australasia; some framed around domestic veterinary specialist or niche education needs, others around industry proximity and participation, and others again around multi-disciplinary links with global relevance. In particular, working with ACIAR and other R&D partners to create a framework for different veterinary postgraduate research offerings by various schools, targeting the needs not only of Australasia but of our Pacific and South-East Asian neighbours, could continue to strengthen Australasia's and our region's ability to meet these challenges.

**Recommendation 25:**  
Australasian veterinary schools and their R&D partners collaborate to develop a complementary set of postgraduate education and research programs to address key national, regional and global needs.







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# Appendices



## APPENDIX 1 REVIEW TERMS OF REFERENCE

Securing Australasia's future in biosecurity, food production, One Health and animal welfare

**Independent expert review of the veterinary science education capability of Australia and New Zealand**

Commissioned by Veterinary Schools of Australia and New Zealand (VSANZ)

### Terms of Reference

#### Context

The global veterinary profession faces enormous challenges meeting the growing needs of farmers, pet owners and governments to safeguard biosecurity, animal welfare and population health. These well-documented challenges have been building for many years, but COVID-19 has brought them into focus and added urgency to calls for major strategic change to the way countries approach veterinary education, research, regulation and service delivery.

Veterinary courses are among the most expensive of all university professional programs to deliver. The high cost reflects the demands of delivering a comprehensive clinical training program across a range of animal species and external accreditation standards, which are driven in turn by the high regulatory standards set by domestic and international veterinary education accrediting bodies acting on behalf of veterinary regulators.

Accreditation standards include numerous delivery requirements not faced for most professional courses, including strict student to staff ratios and the condition that universities directly provide clinical teaching for both large and small animals through veterinary teaching hospital facilities.

The Australian Government's Job-ready Graduates changes to higher education funding provided a welcome seven per cent net increase in funding for each new Commonwealth-supported student from 2021. However, for some Australasian veterinary schools there remains a substantial gap between total funding received for each enrolled domestic veterinary student and the cost of educating them. The Job-ready Graduates package also changed the way universities are funded to support core veterinary science research, effectively removing the 'base research' component from the Commonwealth Grants Scheme (CGS) and implied from student contribution amounts. Australasian universities have for decades covered their funding shortfall for veterinary teaching and research through a range of strategies, including increasing enrolments to dilute fixed costs; the provision of full fee-paying places for domestic and international students; reductions to central overhead charges and, ultimately, by cross-subsidising from revenues earned by other faculties, philanthropy and other sources.

COVID-19 and the prolonged international border closures of Australia and New Zealand have profoundly impacted the operations of the nations' universities and eight schools of veterinary science. Each veterinary school operates in a different institutional, funding and regional context and has experienced the effects of the pandemic differently. However, well before this crisis they had acknowledged collectively through VSANZ that continuing with current approaches to veterinary science education, accreditation and research would not be sustainable, nor would it see them capable of delivering on Australasia's long-term needs for workforce renewal and enhanced research capability.

It is within this context that the Review will consider the following key questions and any other important matters that may arise during the Expert Panel's consultations and analysis.

1. What are the key skills, knowledge and attributes that veterinarians will need in the next decade? How can accrediting bodies, the profession, Australasian universities and governments work more effectively together to ensure that students leave veterinary schools equipped with transferable competencies needed for long and successful careers as veterinarians, as well as take account of the continued financial pressures faced by universities to sustain high-quality veterinary science programs?
2. Looking ten years out, what are the key challenges and opportunities that veterinary schools in Australia and New Zealand face in terms of their responsibilities to educate and train their future veterinary workforces? What needs to change to ensure the schools can address the identified challenges and take advantage of the opportunities over the next decade? Specifically:
  - i. What opportunities are there for structural reform to make Australasian veterinary schools financially sustainable? What have been the key learnings from the disruption to veterinary schools caused by COVID-19?
  - ii. Is there a place to develop a new kind of professional Australian and/or New Zealand veterinary qualification, which has modularisation/specialisation (e.g. companion animals, livestock, equine, poultry, exotic) options – whether at an early or post-primary-qualification stage – focused on the requirements of the nation? If so, how should this be achieved?
  - iii. Can we make changes of the kind described above and still retain the ability of Australia and New Zealand to contribute to a global, mobile veterinary workforce with mutual recognition of qualification and freedom of movement, that is, to continue to attract overseas students and practitioners?

3. How strong is the research performance of Australasian veterinary schools in the global context? What is the nexus between a veterinary school's research capability and its capacity to educate veterinarians suited to the modern workforce? What could be done to optimise the education / research mix of veterinary schools?

**For further information**, Dr Scott Williams, Executive Officer, VSANZ, 0413 059 190, [eo@vsanz.org](mailto:eo@vsanz.org)

## APPENDIX 2 REVIEW PANEL



**Dr Helen Scott-Orr AM PSM FAICD BVSc (Hons) Sydney, DipBact London, MANZCVS Epidemiology**, who chaired the Review Panel, was formerly Australian Inspector-General of Biosecurity (2016-19), and Executive Director Research, Advisory and Education (1998-2009), New South Wales Chief Veterinary Officer (1989-97), and Assistant/Director Brucellosis and Tuberculosis Eradication (1980-86) with NSW Agriculture/Primary Industry. Her career began with mixed and small animal practice in NSW and London and continued with livestock disease research in the UK and Indonesia. Between 1987 and 2015, she also led veterinary capacity-building projects in Indonesia on zoonotic disease control, notably anthrax, brucellosis and rabies. From 1990 to 2016 she served on many boards overseeing veterinary and agricultural research and development organisations, including the Australian Animal Health Laboratory, the Cooperative Research Centres for Weeds, Beef, Sheep, Cotton, Rice and Invasive Animals, and Animal Health Australia.



**Professor Grant Guilford BPhil Massey, BVSc Massey, PhD UC Davis**, was formerly Head of the Institute of Veterinary, Animal and Biomedical Sciences, Massey University, Dean of Science at the University of Auckland, and Vice-Chancellor of Te Herenga Waka – Victoria University of Wellington. He is currently Chair of the New Zealand Veterinary Association. Earlier in his career, he worked in private veterinary practice before undertaking clinical, teaching and research roles at the University of Missouri, the University of California, Davis, and Massey University, and qualifying as a Diplomate of the American College of Veterinary Internal Medicine and a Fellow of the Australasian College of Veterinary Scientists. Over his career he has held governance and advisory roles for Crown Research Institutes, research commercialisation companies, research institutes, joint graduate schools and economic development agencies. In 2015, he was awarded the Australasian Green Gown Award for leadership in sustainability.



**Professor Susan M Rhind OBE, BVMS, PhD, FRCPath, PFHEA, MRCVS**, is Chair of Veterinary Medical Education at the Royal (Dick) School of Veterinary Studies. She graduated from Glasgow University Veterinary School, has a PhD in immunology and initially specialised as a pathologist. Over the last 15-20 years her research has increasingly focussed on veterinary education including assessment and feedback, student support and the use of e-learning and models in support of veterinary education. She was appointed as the first Chair of Veterinary Medical Education in the UK in 2007 and in 2014 became a Principal Fellow of the Higher Education Academy. From 2015 – 2018 she served as Assistant Principal for Assessment and Feedback at the University of Edinburgh and was Director of Veterinary Teaching for almost 20 years. She was the inaugural chair of the Veterinary Schools Council Education Committee and received an OBE for services to veterinary education in 2017.



**Mr Bernard Rupasinghe BA (Political Science) LLB ANU, GDLP ANU, MLLR Sydney** – Panel secretariat and researcher. Bernard is an experienced policy and public affairs specialist. He was Policy Manager for the Australian Dental Association (NSW Branch) from 2003-2014, where he was responsible for issues analysis, policy development, stakeholder engagement and advocacy. From 2014-22 he was Policy and Public Affairs Manager for the Australian Chiropractors Association, in which role he helped to develop the ACA's policy and public affairs strategy, provided public affairs and issues management advice to the CEO and Board, and created new strategic relationships to benefit the business of the ACA. He is currently Policy and Public Affairs Manager for the Australian Society of Anaesthetists.



# APPENDIX 3

## SUBMISSIONS TO THE REVIEW

1. Dr Lakmini Weerakoon, Lecturer in Veterinary Technology, School of Agriculture, Environmental and Veterinary Sciences, Charles Sturt University
2. Professor Paul McGreevy, Professor of Animal Behaviour and Welfare, University of New England
3. Dr Jeannet Kessels, veterinary practice owner and employer
4. Dr Bronwen Bollaert, Healthy Pet Behaviour Services
5. Dr Fiona Cameron, small animal veterinarian
6. Dr Jeannet Kessels, (2) veterinary practice owner and employer
7. Dr Sue Godkin, Registrar, Veterinary Practice Board of Western Australia
8. Dr Kylie Hewson, Deputy Executive Director, Australian Chicken Meat Federation
9. Dr Linda Prescott-Clements, Director of Education, Royal College of Veterinary Surgeons, UK
10. Animal Health Australia
11. Dr Charlie Bunce, rural veterinary practitioner
12. Associate Professor David Beggs, University of Melbourne
13. Associate Professor Stuart Barber, Melbourne Veterinary School
14. Dr Kathryn James, small animal veterinary practitioner
15. ACT Veterinary Practitioners Board
16. Dr Andrew Havadjia, mixed veterinary practitioner
17. Dr Alison Havadjia, mixed veterinary practitioner
18. Dr John Wiltjer, mixed veterinary practitioner
19. Dr William Lucas, mixed veterinary practitioner
20. Dr Charlie Mintz, livestock veterinary practitioner
21. Dr Belinda Dare, veterinary practitioner
22. Dr Garth Riddle, veterinary practitioner
23. Professor Keith Thompson, retired Professor of Veterinary Pathology, Massey University
24. Majella O'Leary, Education and Professional Development Manager, Veterinary Council of Ireland
25. Dr Jo Coombe, Dr Stephanie Bullen and Ms April Brown, for Dairy Australia
26. Professor Megan Smith, Executive Dean, Faculty of Science and Health, Charles Sturt University
27. Dr Susan Swaney, President, Sheep, Camelid and Goat Veterinarians, Dr Jane Vaughan, Cria Genesis, and Dr Helen McGregor, Redefining Agriculture
28. Dr Geoff Niethe, Northern Australia Animal Production Research Coordinator, Meat and Livestock Australia
29. Mr Iain McLachlan, CEO and Registrar, Veterinary Council of New Zealand
30. Professor Jon Huxley, Dean and Head of School, Tawharau Ora – School of Veterinary Science, Massey University
31. Dr Matthew Perrot and Dr Liza Schneider, Sustainable & Responsible Veterinary Practice Stakeholder Group, representing Green Team, Tawharau Ora – School of Veterinary Science, Massey University (staff response), and SustainaVet, representatives of veterinary industry driving positive change in environmental sustainability
32. Ms Carol Irvine, Registrar, Veterinary Surgeons Board of South Australia
33. Dr Jenny Weston, Dean of Veterinary Education, Massey University
34. Dr Christy Secombe, Head of Veterinary and Public Affairs, Australian Veterinary Association
35. Dr Suzanne Fowler, Chief Science Officer, RSPCA Australia
36. Dr Graeme Cook, Chief Veterinary Officer, Agriculture Victoria
37. Associate Professor Jennifer Carter, Director of Veterinary Education, Melbourne Veterinary School

38. Dr Mary Carr, Chief Veterinary Officer, South Australian Department of Primary Industries and Regions
39. Dr Cristin Dwyer, Head of Veterinary Services, New Zealand Veterinary Association
40. Dr Rebecca Dickinson, Veterinary Support Services
41. Dr Michelle Rodan, Chief Veterinary Officer, Western Australian Department of Primary Industries and Regional Development
42. Dr Caitlin Pfeiffer, veterinary epidemiologist
43. Dr Amanda Macdonald, mixed veterinary practitioner
44. Dr Tom Loughnan, mixed veterinary practitioner
45. Dr Ken Jacobs, equine veterinary practitioner
46. Dr Scott Norman, Registered Specialist in Veterinary Reproduction
47. Professor Ted Whitem, Dean, College of Public Health, Medical and Veterinary Sciences, James Cook University
48. Dr Rod Thompson, Veterinary Officer, Department of Primary Industries and Regional Development Western Australia
49. Dr Julie Strous, Executive Director, Australasian Veterinary Boards Council (AVBC) Veterinary Schools Accreditation Advisory Committee
50. Dr Duncan Runciman, livestock veterinarian employer, personal submission
51. Professor Michael McGowan, Professor Livestock Medicine, University of Queensland
52. Professor Joanne Wright, Deputy Vice-Chancellor (Education), University of Sydney
53. Dr Henry Annandale, Dean, School of Veterinary Medicine, Murdoch University
54. Professor Nicholas Sangster, former Head of School of Veterinary Science, Charles Sturt University
55. Dr Matt Landos, Director, Future Fisheries Veterinary Service
56. Elaine Robertson, Executive Officer, Australian Veterinary Behaviour Interest Group (AVBIG), and Australian Small Animal Veterinarians (ASAV), Australian Veterinary Association
57. Professor Margaret Reilly, Head of Veterinary Science, James Cook University
58. Dr Ian Fulton, Specialist Equine Surgeon
59. Dr Kirsti Seksel, Registered Veterinary Specialist in Behavioural Medicine (Companion Animals)
60. Dr Bronwen Bollaert, President, Veterinary Behaviour Chapter, Australian and New Zealand College of Veterinary Scientists (ANZCVS)
61. Dr Sarah Preston, Convenor, Australian Society for Parasitology Education Committee
62. Mr Andrew Robins, veterinary student
63. Anonymous, livestock industry veterinarian
64. Dr Rob Atkinson, Principal Veterinary Officer (A/g), Office of the Australian Chief Veterinary Officer
65. Dr Duncan Runciman, Veterinary Director, Apiam Animal Health
66. Dr Norman Blackman, retired private and government veterinarian
67. Dr Megan Thomas, Lecturer, Small Ruminant Health and Production Animal Medicine, University of Melbourne
68. Professor Nigel Perkins, Head of School of Veterinary Science, University of Queensland
69. Dr Janet Berry, Communications Team, Veterinarians for Climate Action

# APPENDIX 4 ORGANISATIONS AND PERSONS CONSULTED

Date	Institution	Attendees
28 Sept 22	The Australian Veterinary Association	1. David Andrews, Chief Executive Officer 2. Meredith Flash, Head of Education 3. Christy Secombe, Head of Veterinary and Public Affairs
28 Sept 22	The University of Queensland	1. Professor Deborah Terry, Vice Chancellor
29 Sept 22	Massey University	1. Professor Jan Thomas, Vice Chancellor
3 Oct 22	Murdoch University	1. Professor Andrew Deeks, Vice Chancellor 2. Professor Jonathan Hill, Executive Dean, College of SHEE 3. Dr Henry Annandale, Interim Principal, School of Veterinary Medicine
6 Oct 22	AVBC – VSAAC Co-Chairs	1. Professor Jennie Hodgson 2. Emerita Professor Rosanne Taylor 3. Dr Peter Gibbs, AVBC Chair 4. Dr Julie Strous, AVBC Executive Director
6 Oct 22	National Farmers Federation	1. Tony Mahar, CEO
7 Oct 22	University of Adelaide	1. Professor Peter Høj, Vice Chancellor
17 Oct 22	Australian Veterinary Boards Council	1. Dr Peter Gibbs, AVBC Chair (and VPBACT) 2. Dr Deborah Neutze, VPBACT 3. Dr Mark Simpson, VPBNSW 4. Professor Margaret Reilly, VSBQLD 5. Dr Fiona Thompson, VSBQLD 6. Dr Tony Leeflang, VBPWA 7. Dr Emma Watkins, VPBT 8. Assoc Prof David Beggs, AVA 9. Dr Lindsay Burton (Chair), VCNZ 10. Iain McLachlan, VCNZ Chief Executive Officer 11. Jon Hill, AVBC Advisory Committee on the Registration of Veterinary Specialists
18 Oct 22	New Zealand Veterinary Association	1. Kevin Bryant – Chief Executive Officer 2. Cristin Dwyer – Head of Veterinary Services – Large Animals 3. Sally Cory – Head of Veterinary Services – Companion Animals 4. NZVA Members – by way of a survey of members and zoom discussion
6 Nov 22	New Zealand Veterinary Association	1. Kate Hill – President 2. Grant McCullough – Immediate Past-President
7 Nov 22	Veterinary Council of New Zealand	1. Iain McLachlan – Chief Executive Officer and Registrar
9 Nov 22	New Zealand Tertiary Education Commission	1. Tim Fowler – Chief Executive Officer 2. Gillian Dudgeon – Deputy Chief Executive, Delivery Directorate
11 Nov 22	NZ Ministry for Primary Industries	1. Mary Van Andel, Chief Veterinary Officer 2. Grant Matthews, Principal Veterinary Advisor
21 Nov 22	The University of Sydney	1. Prof Joanne Wright, Deputy Vice-Chancellor (Education) 2. Prof Michael Wheatland, Associate Dean (Education) 3. Prof Jacqueline Norris, Head of School 4. Prof Paul Sheehy, Deputy Head of School 5. Dr Susan Maastricht, Director, Research Integrity and Ethics Administration 6. Mr Russell Taylor, Associate Director, Commercial Advisory 7. Ms Denise Wee, Executive Officer, Higher Education Policy
25 Nov 22	Veterinary Schools of Australia and New Zealand	1. Nigel Perkins (University of Queensland) 2. Jacqui Norris (University of Sydney) 3. Josh Slater (University of Melbourne) 4. Rob Woodgate (University of Adelaide) 5. Jon Huxley (Massey University) 6. Scott Williams (VSANZ Executive Officer)
7 Dec 22	Recent Graduates	1. Clare Bryce (graduated University of Queensland) 2. Frances Zewe (graduated University of Sydney) 3. Jordi Hoult (graduated Massey University)
9 Feb 23	University of Sydney	1. Tim Payne, Director, Higher Education Policy and Projects, Office of the Vice-Chancellor and President
15 Feb 23	Australian Government Department of Education	1. Amanda Brown (Director, Commonwealth Grants Scheme Policy, Funding and Students Branch   Higher Education Division) 2. Craig Nightingale (Assistant Director, Commonwealth Grants Scheme Policy, Funding and Students Branch   Higher Education Division)
15 Feb 23	Veterinary Schools of Australia and New Zealand	1. Nigel Perkins (VSANZ Chair and Queensland) 2. Henry Annandale (Murdoch) 3. Josh Slater (Melbourne) 4. Jacqui Norris (Sydney) 5. Jon Huxley (Massey) 6. Geoff Dutton (CSU) 7. Margaret Reilly (JCU) 8. Scott Williams (VSANZ EO)



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