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INTRODUCTION

Veterinary medicine is often popularly understood as the branch of medicine that cares for pet and domestic animals. However, the true scope of the veterinary profession stretches far beyond clinical care: veterinarians play crucial roles in safeguarding public health, ensuring food security, advancing scientific knowledge, preserving ecosystems, and shaping policy.

In recent decades, the world has confronted major challenges: emerging zoonotic diseases (those transmitted between animals and humans), antimicrobial resistance, climate change, and globalized trade in animal products. In these contexts, the veterinary profession becomes indispensable. Understanding the multifaceted contributions of veterinarians across professional fields is vital to appreciating their impact and advocating for stronger integration, resources, and recognition.

This research intends to explore systematically how veterinary medicine is important in diverse professional domains. The goals are:

- To map and analyze the roles veterinarians play in clinical settings and beyond.
- To examine how veterinary work intersects with public health, agriculture, research, environmental conservation, and policy.
- To present real-world examples and case studies that illustrate these roles.
- To identify current challenges and propose future directions to strengthen the profession's impact.

ABSTRACT

This research paper examines the importance of veterinary medicine across multiple professional fields beyond companion animal care. The study highlights the roles of veterinarians in clinical practice, public health (especially through the one health framework), food security and agriculture, scientific, public health research and innovation, wildlife conservation and environmental health, and policy/regulation. Through literature from open access sources and current examples, the paper illustrates how veterinarians are central to controlling zoonotic diseases, ensuring food safety, advancing biomedical knowledge, preserving biodiversity, and shaping global health governance. Key challenges — such as workforce shortages, limited funding, burnout, and gaps in interdisciplinary integration — are discussed. The paper concludes that reinforcing veterinary capacity, promoting cross-sector collaboration, and integrating veterinarians more strongly into health systems are essential for future resilience.

Extended-Animal Osteology:

Animal osteology, the scientific study of skeletal structures in animals, occupies a central position in fields ranging from veterinary medicine and comparative anatomy to paleontology, archaeology, and forensics.

DEVELOPMENT

3.1 Veterinary medicine in clinical Practice

In the clinical realm, veterinarians are the front-line professionals diagnosing, treating, and managing disease in animals. Their daily tasks include preventive medicine (vaccinations, parasite control), diagnosis (via imaging, lab tests, pathology), surgery, emergency care, dental treatments, and long-term management of chronic conditions like kidney disease, diabetes, or arthritis.

But the clinical role also extends to exotic animals, Zoo species, wildlife rehabilitation, and laboratory animals used in knowledge across anatomy, pharmacology, pathology, and behavior.

another increasingly important dimension is evidence-based veterinary medicine (EBVM) - veterinarians must integrate best-available research evidence with clinical judgment and client preferences. A recent qualitative study in the UK found that veterinarians value evidence-based data to inform owner decisions, but many cite lack of time, resources, or research training as barriers to participation in client-animal research. moreover, clinical practice is not without its internal stresses: the profession is facing rising rates of burnout, mental health strain, workforce shortage. A recent article emphasizes that veterinary professionals often endure unsustainable working conditions, leading to attrition and ethical distress.

3.2 Veterinary medicine in Public health & one health.

One of the most significant expansions of veterinary significance is in public health under the one health paradigm — the recognition that human, health animal, and ecosystem health are interconnected. Veterinarians contribute in multiple ways:

- Zoonotic disease prevention and surveillance:

Over 75% of emerging infectious diseases in humans originate from animals. Veterinarians serve as early detectors and controllers of outbreaks, contributing to disease surveillance and response.

- Food safety and inspection:

Veterinarians working in public health agencies inspect animals before and after slaughter, monitor residues, detect pathogens, and ensure hygienic processing.

- Policy, regulation, and public education:

They help set regulations on antimicrobial use, food standards animal welfare, and run programs to educate farmers, pet owners, and communities on disease prevention.

Veterinarians are thus a first line of defense for public health by controlling diseases at the animal source before they cross to humans.

3.3 Veterinary Medicine in food security, Agriculture & food safety.

Livestock and animal-derived foods are central to global nutrition and economies. Veterinarians contribute to raising productivity, reducing losses, and ensuring safe supply chains:

- Healthy herds produce more milk, meat, eggs, and reduce mortality and morbidity. Veterinary interventions in herd health, reproduction, nutrition, and disease control are key.
- Veterinary services (national-level or government veterinary authorities) play a pivotal role in applying risk-based food safety systems along the "farm-to fork" continuum, using hazard analysis, critical control points, and auditing measures.
- They also issue certifications for trade in animal products, ensuring compliance with international health standards and facilitating export markets.

Without strong veterinary oversight, foodborne diseases, export rejections, trade barriers, and economic losses are more likely. In fact, foodborne illness causes major human health burdens. In the U.S. alone, about 1 in 6 people get sick annually from contaminated foods. Veterinarians help prevent such outcomes by intervening early in animal production.

3.4 Veterinary medicine In Research, Academia Y Innovation.

Veterinarians are not only practitioners but also Scientists, educators, and Innovators;

- They contribute to biomedical research and comparative medicine, studying animal models for human diseases, developing vaccines and therapies, and performing translational studies.
- In academics, they teach veterinary curricula, mentor new generations, publish research, and drive advances in veterinary science. open access veterinary journals such as BMC veterinary research offer platforms for global dissemination.
- They also adopt technological innovations: for example, generative AI methods for medical image synthesis in veterinary radiology to overcome data scarcity being explored to assist veterinarians in writing, diagnostics, education, and research tasks.

However, barriers exist: many practicing veterinarians report having time or training to engage in research, and limited funding for veterinary clinical trials.

3.5 Veterinary medicine In wildlife, conservation Y Environment.

Veterinarians play essential roles in preserving biodiversity, ecosystem health, and wildlife welfare.

- They monitor wildlife health, detect disease spillover events, assist in rehabilitation of injured or orphaned wildlife, and work in captive breeding and conservation programs.
- They study ecological sentinel indicators: diseases in animals may signal environmental degradation, pollution, or climate change impacts.
- They help manage human-wildlife conflicts, veterinary interventions in reintroduction programs, and ensure welfare standards in zoos, sanctuaries, and protected areas.
- They also contribute to conservation medicine, where veterinary expertise intersects with ecology, veterinary pathology, and wildlife biology.

their roles help maintain ecosystem resilience, detect emerging threats from wildlife reservoirs, and conserve species facing extinction pressures.

3.6 Veterinary medicine, In policy, Regulation & global Infrastructure.

finally, Veterinarians are Integral to governance, regulation, and global health systems:

- National Veterinary authorities or veterinary services implement, audit, and enforce animal health standards, disease control programs, and trade certifications.
- Veterinarians help design policies on antimicrobial usage, biosecurity, animal welfare laws, and feedstock/chemical regulation.
- Globally, veterinarians contribute to organizations such as WOAH (OIE), FAO, and WHO to develop standards, conduct evaluations (e.g. performance of veterinary services tools), and coordinate international disease responses.
- The role of chief veterinary officer is a key government office overseeing national veterinary strategy, diseases control, food safety, and animal welfare.

Thus, veterinary involvement in policy ensures that scientific and health concerns are integrated into national and international decisions affecting animals, humans, and ecosystems.

4. CASE STUDIES & EXAMPLES.

- **WOAH/OIE Role in food safety:** The official veterinary services play a central role in risk-based regulation across the food chain, from farm to trade certification. Their responsibilities include disease surveillance, meat inspection, and oversight of antimicrobial usage.

- **Public Health veterinarians in U.S. food safety:** In the United States, public health veterinarians in federal agencies inspect live animals and carcasses for disease, enforce compliance, and mitigate zoonotic risks.

- **Evidence-based veterinary research:**

A UK qualitative study revealed that veterinarians desire evidence-based data to make informed decisions, but face constraints in time, resources, and research capacity.

- **Emerging workforce and well-being crisis:**

A UK qualitative study revealed that veterinary professionals face high rates of burnout and mental health issues, contributing to workforce shortage and ethical dilemmas in access to care.

These cases illustrate the diversity and depth of veterinary impact across sectors.

5. CHALLENGES AND FUTURE OPPORTUNITIES.

Challenges:

- workforce shortage & uneven distribution:

Many regions, especially in low- and middle-income countries, lack sufficient veterinarians, especially in public service roles

- Burnout & mental health:

The emotional and professional stressors of veterinary work lead to high rates of mental health issues and attrition.

- Funding & resources:

Limited funding for veterinary public health, diagnostics, research, and infrastructure constrains capacity.

Opportunities & Future Directions:

- Strengthening one health frameworks:

through institutional collaboration among human health, animal health, and environmental sectors.

- Innovating in veterinary public health and surveillance systems: to preempt zoonotic threats.

- Promoting veterinary mental health and support programs, well-being training, workload management.

- Expanding open access publishing and data sharing: in veterinary science to ensure that practitioners globally can access and use research.

6. CONCLUSION

Veterinary medicine is far more than caring for pets—it is a foundational pillar for public health, food security, environmental sustainability, scientific advancement, and policy governance. Across clinical practice, public health, agriculture, research, conservation, and regulation, veterinarians play indispensable roles in preempting disease, protecting ecosystems, ensuring safe food, and shaping responsible governance.

However, to fully harness this potential, key challenges—workforce deficits, mental health concerns, resource constraints, publication access, and policy fragmentation—must be addressed. The future demands robust support for veterinary capacity, stronger cross-sector collaboration under the one health model, investment in technology and research, and elevation of the profession within health systems.

In sum, strengthening the veterinary profession is not just desirable—it is essential for the health and sustainability of societies, animals, and the planet.

7. BIBLIOGRAPHY

- Cáceres SB, et al. The roles of veterinarians in meeting the challenges of health and welfare of livestock and global food security. PMC.
- Furtado T, Perkins E, Archer DC. Contributing to evidence - based veterinary medicine: A qualitative study of veterinary professionals' views and experiences. PLoS One (2025).
- Gordon S, et al. The changing face of veterinary professionalism. MDPJ Education Journal (2023).
- Corrigan VK, et al. The future of flourishing in veterinary medicine: a systems perspective. Frontiers in Veterinary Science (2025).
- Veterinary and public health: Veterinarians working to protect animal and human health. AVMA.
- Merck Veterinary manual: Role of veterinarians in public health and one health.
- The role of the veterinary services in food safety (OIE/WOAH).
- "Food Safety and public health" (MSU perspectives).
- BMC Veterinary Research - open access Journal.
- Generative active learning for veterinary radiology.
- Deep learning ECG classification for canines.