



Opinion

Veterinary nurses at the forefront of one health: European perspectives

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ABSTRACT

The One Health framework articulates the interdependence of human, animal, and environmental health, gaining prominence amid rising zoonotic events, antimicrobial resistance, and biodiversity loss. While veterinary surgeons, physicians, and ecologists are typically emphasized in One Health discourse, the role of university-trained veterinary nurses—whose formal recognition remains nascent in parts of Europe—has received limited attention. Veterinary nurses occupy pivotal positions in clinical practice, implementing infection prevention protocols, conducting zoonotic disease surveillance, and maintaining hygiene standards among staff and clients. They support antimicrobial stewardship through responsible administration and client education, reducing the emergence of resistant pathogens. Additionally, veterinary nurses enhance animal welfare via behavioural assessments, safeguard food safety by supporting livestock health, and facilitate animal-assisted therapy through rigorous evaluation of therapy animals' health and behaviour. Their involvement in disaster response sustains animal health services, contributing to community resilience. As trusted professionals, veterinary nurses also serve as public health educators, leveraging their relationships with animal owners to promote evidence-based guidance on zoonoses prevention, biosecurity, and responsible antimicrobial use. Despite these multifaceted contributions, veterinary nursing practice in Europe is constrained by heterogeneous educational standards, inconsistent legal recognition, and limited participation in policy forums. Professional advocacy has driven incremental reforms; however, systematic harmonization of curricula, regulatory frameworks, and interdisciplinary collaboration remains essential. We argue that empowering veterinary nurses within One Health systems will optimize the early detection and control of shared health threats, strengthening One Health networks across Europe and similar contexts worldwide.

1. Introduction

The One Health framework emphasizes that health outcomes for ecosystems shared by humans, other animals and plants are deeply interconnected. It has gained policy traction amid rising concerns over zoonotic spillovers, antimicrobial resistance (AMR), and biodiversity loss. While veterinarians, physicians, and ecologists are traditionally emphasized in One Health models, university-trained veterinary nurses—an incipient profession even in some European countries, like Portugal—are emerging as underrecognized yet essential actors [1]. Positioned at the frontline of animal care, they routinely provide clinical care, observe health anomalies, deliver public education, monitor antimicrobial use, and apply biosecurity measures [2]. Their dual function—providing technical expertise and offering health communication to the public—makes them a valuable bridge across human–animal

interfaces [2]. This opinion explores their evolving role in Europe as One Health practitioners over the past two decades. When we refer to veterinary nurse, we infer that they have university level education.

2. Veterinary nurses and One Health: a neglected topic

Veterinary nurses' professional recognition warrants their integration into One Health teams, with tasks and activities compatible with their higher education training. In Europe, veterinary nurses are getting involved in a diverse range of activities directly relevant to One Health objectives. Their contribution is evident, but not well documented, in 10 main areas.

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2.1. Infection control and surveillance

Veterinary nurses play a critical role in the early detection and prevention of zoonotic diseases within clinical settings, particularly through their involvement in infection control, hygiene monitoring, and client (livestock producers or animal owners) education. Acting as infection preventionists, veterinary nurses are often responsible for implementing protocols, monitoring hygiene standards, and educating both staff and clients about zoonotic risks. Their responsibilities include identifying early signs of parasitic infections during routine consultations and promoting compliance with preventive measures, especially in underserved or rural communities. Veterinary nurses also lead initiatives to ensure that infection prevention and control policies are consistently applied in daily veterinary practice, reinforcing biosecurity and reducing the risk of disease transmission. Additional responsibilities in this area include drafting infection control policies and procedures and providing advice on safe disposal of antimicrobials. Furthermore, they contribute significantly to best practices in clinical hygiene, making them essential frontline actors in safeguarding both animal and public health [2].

2.2. Antimicrobial Stewardship (AMS)

Veterinary nurses are deeply engaged in antibiotic administration, client education, prescription monitoring across companion animal, equine, and livestock practices, and providing advice on safe disposal of antimicrobials to reduce environmental contamination. They are often tasked with ensuring compliance with antimicrobial protocols, providing client guidance on proper administration, and promoting preventive health measures that reduce unnecessary antimicrobial use. These activities have been associated with improved adherence to treatment plans and reduced misuse, thereby supporting broader AMR mitigation efforts within One Health systems. Additionally, veterinary nurses' close monitoring of animal responses and owner compliance provides valuable feedback for refining AMS practices, yet their systematic inclusion in national AMS frameworks remains limited in many jurisdictions, representing an opportunity for strengthening One Health implementation [3].

2.3. Animal welfare and behavioural observation

Behavioural problems in companion animals can significantly affect the quality of life of pets and their owners, with implications for public health and community well-being. These issues are frequently encountered in clinical settings, underscoring the need for enhanced provision of behavioural medicine within veterinary nursing education. As animal welfare standards evolve and the One Health framework is increasingly applied, veterinary nurses are poised to be recognized for their expertise in behavioural assessment and early intervention, which contributes to preventing aggression and reducing the risk of injuries or abandonment. Reflecting this need, several European institutions have begun to formally incorporate welfare science and behavioural medicine into veterinary nursing curricula, equipping nurses with the competencies required to support animal and human health concurrently [2].

2.4. Identifying and addressing family-based cruelty

Veterinary nurses play a crucial role in identifying and addressing animal cruelty, which is often linked with child abuse and domestic violence within households. As frontline professionals, they are well positioned to notice unexplained or repeated injuries in animals, observe concerning family dynamics, and document findings that may indicate broader patterns of violence. By safely raising concerns, making appropriate referrals, and collaborating with animal welfare and social services, veterinary nurses help protect animal welfare while contributing to the early detection of family violence, reinforcing their essential

role in safeguarding both animal and human health within a One Health framework [2].

2.5. Food safety and security

By focusing on the health and welfare of food-producing animals, veterinary nurses help ensure that products like meat and dairy are safe for consumption, which directly supports public health by reducing risks of zoonotic diseases and foodborne illnesses. Moreover, the emphasis on healthy animals leading to better nutritional outcomes and economic stability underscores the broader socio-economic impact of veterinary nursing. Healthy livestock not only improves food security and nutrition but also sustains livelihoods for agricultural communities, promoting resilience and prosperity.

2.6. Animal-assisted therapy and mental health

Veterinary nurses often work with companion animals used in animal-assisted therapy to improve mental health outcomes in humans. They ensure the health and suitability of therapy animals through wellness checks, behavioural screening, vaccination verification, and ongoing monitoring—especially before visits to hospitals, nursing homes, and rehabilitation. By maintaining physical and behavioural health standards, veterinary nurses help guarantee that therapy visits are safe, comfortable, and effective, thereby promoting emotional well-being and supporting psychosocial interventions for clients and staff alike. In addition, their close relationships with clients enable them to provide support and guidance when pet health concerns generate psychosocial stressors (e.g., grief, anxiety, or family strain), helping to link owners with appropriate counselling or community support services [2].

2.7. Emergency and disaster response

Veterinary nurses participate in disaster preparedness and response, such as during floods, earthquakes, or pandemics. Their work, focusing on the health and welfare of animals during crises, helps to protect the livelihoods of communities that depend heavily on animals for income, food, and economic stability. Hence, they not only safeguard animal well-being but also contribute to broader community resilience by minimizing disruptions in food supply and reducing potential public health risks linked to animal diseases or distress. This integrated approach highlights the importance of veterinary nursing within disaster management frameworks and One Health strategies, where protecting animal health is essential to supporting human health and socio-economic recovery in affected areas. Beyond immediate clinical care, veterinary nurses also play an important role in alleviating psychosocial stressors associated with the displacement of animals and their owners during environmental disasters. Their contribution extends to supporting practical welfare (triage, sheltering, reunification) as well as promoting the emotional well-being of affected families [2,4].

2.8. Public and community health education

Veterinary nurses also function as health educators. In addition to serving as a bridge between animals and humans, they are also a vital link between clients and other professionals integrating the One Health team. They often receive valuable information due to their closer contact with clients and the trusting relationships they develop with them, as previously mentioned. Examples include reports of unusual clusters of animal illness in a household or community, repeated treatment failures, or changes in livestock management practices that could increase zoonotic risks. This proximity and trust are an asset in promoting client health education. Their communication skills, trust with the larger One Health team and with clients, and familiarity with local animal and human health patterns enable them to deliver effective messaging on zoonoses prevention, hygiene, and AMR. In addition, veterinary nurses

frequently conduct telephone triage, acting as first points of contact who can provide tailored advice, identify urgent risks, and channel cases appropriately [2].

2.9. Environmental health monitoring and climate adaptation

Veterinary nurses contribute to environmental health within the One Health framework by participating in monitoring activities that link animal health to environmental conditions. They assist in recognizing and reporting environmental hazards (such as water contamination affecting livestock or vector-borne disease risks) and can collect environmental samples during field visits to support surveillance systems. Additionally, veterinary nurses support climate adaptation measures by advising on heat stress management in animals, promoting sustainable husbandry practices that reduce environmental impact, and participating in community initiatives on responsible antimicrobial disposal to prevent environmental contamination. Through these actions, veterinary nurses reinforce the interconnectedness of animal health, human health, and environmental stewardship, aligning their professional activities with broader climate resilience and sustainability objectives within One Health [2].

2.10. Professional representation and policy involvement

On the policy front, veterinary nurses are beginning to gain visibility in One Health dialogues, but their participation in national and European forums remains limited. To date, most advances have occurred within veterinary nursing professional events where One Health-related issues are increasingly addressed—for example, the British Veterinary Nursing Association (BVNA) Congress (United Kingdom, 2023), the Eastern European Regional Veterinary Conference (Serbia, 2022) and the VETNNET Conference (Denmark, 2022). As human-health nurses resist acknowledging One Health [5], veterinary nurses face a similar struggle: while securing recognition in their professional arenas, veterinary nurses' role in formal One Health policy forums remains underdeveloped, limiting their contribution to integrated One Health Systems.

3. Discussion

In Europe, as in North America and Oceania, veterinary nurses with university-level training are emerging as vital, though often under-acknowledged, contributors to the operationalization of One Health. Across these regions, veterinary nursing is evolving into a regulated profession requiring tertiary education, with veterinary nurses participating in surveillance, infection control, antimicrobial stewardship, animal welfare, and public education. In Asia, Latin America, and Africa, frameworks for veterinary nursing vary, but countries such as Australia, New Zealand, Japan, Thailand, Brazil, Chile, and South Africa have established structured programmes offering university diplomas or degrees in veterinary nursing or veterinary technology. These programmes equip graduates with the competencies needed to engage in One Health initiatives. However, in many other countries, the absence of formal university-level veterinary nursing education means that nursing-related tasks are instead performed by animal health technicians or paraprofessionals trained through short courses or apprenticeships, many times without standardized curricula or legal recognition, limiting their integration into structured One Health teams. Importantly, veterinary nursing is not limited to entry-level training. After 4–6 years of practice within a specific discipline, qualified veterinary nurses may pursue specialist credentials. These advanced practitioners not only reinforce the clinical team but may also serve as credible educators and One Health advocates, providing evidence-based guidance on zoonoses, antimicrobial stewardship, and animal welfare. Their evolving professional trajectory underscores the urgency of harmonizing recognition and integration of veterinary nurses within One Health frameworks.

In Europe, approximately 35 countries continue to offer vocational-

only training for veterinary nurses, using varied denominations such as veterinary nurse, veterinary auxiliary, veterinary assistant, veterinary technician, veterinary feldsher, or veterinary practice/clinic assistant. Around 16 countries provide higher-education (bachelor-level or above) veterinary nursing degrees, while two countries (Kosovo and Monaco) have no local veterinary nursing training structure at all. However, the expansion of veterinary nurses' contributions to One Health across Europe is uneven and constrained by persistent institutional, legal, and educational limitations. One major barrier is the lack of harmonized training standards across countries, resulting in varying degrees of integration of One Health principles and behavioural science into veterinary nursing education. Even among existing programmes, many offer limited curricular content on zoonoses, biosecurity, or public health, which limits the preparedness of veterinary nurses to contribute fully to One Health objectives. Legal recognition of veterinary nurses also varies substantially. In several European countries, the professional scope of veterinary nurses is either poorly defined or limited to subordinate technical tasks in veterinary consulting rooms, mostly private, restricting their participation in public health programs or disease surveillance networks. This undermines their ability to contribute meaningfully to One Health initiatives.

On the policy front, veterinary nurses are beginning to gain visibility in One Health dialogues across Europe, but their participation in national and European forums remains limited. Advocacy by organizations such as the BVNA, the European Veterinary Nurses and Technicians Association (EVNTA), and the Federation of Veterinarians of Europe (FVE) has contributed to growing professional recognition for veterinary nurses and their increased presence in continuing-education forums and collaborative working groups. While these organizations are working to elevate the role of veterinary nurses, formal and systematic inclusion in interprofessional and One Health symposia remains limited. Nevertheless, more systematic efforts are required to ensure that veterinary nurses have a seat at the table in decision-making processes related to public health preparedness, disease outbreak response, and veterinary education reform.

Investing in the veterinary nursing workforce offers a strategy for enhancing resilience in One Health systems [1,6]. Veterinary nurses are often embedded in local contexts and maintain close relationships with both animals and clients, positioning them as ideal conduits for the early detection of zoonotic risks and for promoting responsible behaviours such as hygiene, vaccination, and antimicrobial stewardship. Their inclusion in formal surveillance systems, outbreak preparedness plans, and public health research consortia should be viewed as essential to operationalizing One Health. While this applies clearly within Europe, the principle is equally relevant in other settings, where comparable cadres such as animal health technicians and community animal health workers could be similarly engaged to strengthen One Health capacity at the community level.

4. Conclusions

Veterinary nurses' roles span functions that directly support the prevention and control of shared health threats at the human–animal–environment interface. Their proximity to animal health issues, coupled with growing educational and professional competencies, positions them as indispensable actors in both routine and crisis health contexts.

As One Health continues to evolve in response to global health challenges such as climate change, AMR, emerging zoonoses, and diseases with pandemic potential, veterinary nurses must be fully recognized and empowered as frontline One Health professionals. Strengthening their representation in education, regulation, and policy-making will be critical to ensuring a One Health workforce capable of delivering resilient, equitable, and integrated One Health solutions across Europe and in other parts of the world where veterinary nursing is established or emerging as a vibrant profession. Further research and

systematic documentation of their contributions will be essential to inform and sustain this integration into One Health systems globally.

CRediT authorship contribution statement

Rosa Ferrinho: Writing – review & editing, Writing – original draft, Conceptualization. **Ana Margarida Afonso:** Writing – review & editing. **Paulo Ferrinho:** Supervision, Conceptualization.

Declaration of competing interest

None reported.

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Data availability

No data was used for the research described in the article.

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