

Veterinary public health capacity-building in India: a grim reflection of the developing world's underpreparedness to address zoonotic risks

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ABSTRACT

Veterinary public health (VPH) is ideally suited to promote convergence between human, animal and environmental sectors. Recent zoonotic and emerging infectious disease events have given rise to increasing calls for efforts to build global VPH capacities. However, even with their greater vulnerability to such events, including their economic and livelihood impacts, the response from low- and middle-income countries such as India has been suboptimal, thereby elevating global health risks. Addressing risks effectively at the human–animal interface in these countries will require a clear vision, consistent policies, strategic approach and sustained political commitment to reform and refine the current VPH capacity-building efforts. Only then can the discipline serve its goal of disease prevention, poverty alleviation and support for sustainable livelihoods through improvements in human and animal health.

Key words: capacity-building, India, veterinary public health, zoonoses

INTRODUCTION

The importance of veterinary public health (VPH) capacity in effectively addressing issues on the human–animal interface has long been recognized. Different policy proclamations have highlighted the relevance of veterinary contribution to public health practice.¹ However, globally, VPH capacity-building efforts have focused largely on foods of animal origin and meat-inspection procedures. In addition to food safety, VPH has a direct role to play in ensuring food security, in public health nutrition, and in ensuring public safety in relation to endemic as well as emerging zoonotic diseases. But limited focus on the role of VPH in wider issues related to public health, trade and livelihood has led to limited involvement and consequent neglect of this discipline in public health practice. While there is variable discussion about the other domains of VPH, concerns about emerging infectious disease (EID) events since the early 1990s, has once again renewed interest in the role played by the discipline of VPH in dealing with diseases of the human–animal interface. This paper seeks to examine the status of VPH education in India, in relation to other countries, with reference to zoonoses and EIDs.

Global response to capacity-building in veterinary public health: a mixed bag

Over the last decade, veterinary schools in Europe and North America have changed their VPH training by introducing new topics and teaching methodologies to respond to the evolving demands of the sector. Accommodating increasing prominence of transboundary and trade-related issues, they have transitioned from local, country-specific approaches to more global ones.² For example, schools of veterinary medicine in the United States of America have developed formal collaboration with schools of public health, offering joint degree programmes (Doctor of Veterinary Medicine/Master of Public Health). Many veterinary schools in Canada have endorsed the concept of ecohealth in their Doctor of Veterinary Medicine and graduate training, in response to growing emphasis on transdisciplinary “One Health” principles.

On the other hand, the response of low- and middle-income countries has been variable. While Latin America has demonstrated more sophisticated collaborative mechanisms, such as the inter-country mechanism called Consejo

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Panamericano de Educación en las Ciencias Veterinarias (COPEVET), which coordinates improvements in school accreditation, professional certification and curricular harmonization across the continent,³ South-East Asian countries' focus on developing transdisciplinary responses to transboundary issues remains limited. While some (mainly local) zoonoses are discussed in the infectious disease programmes in veterinary curricula, linkages made to their public health dimension vary widely between programmes.⁴

India's response to veterinary public health: languishing in nascent stages

A useful framework to assess the development of VPH services has been proposed by Lipman and colleagues, who classify veterinary services into three stages of development, starting from areas with limited organized agriculture, to developing societies with legislations governing agricultural systems to developed societies with highly organized agricultural systems and evolved VPH systems.² The Indian response, seems to be lagging behind in the first two stages, as is evident from the current status of VPH capacity building efforts and the strategic vision guiding these efforts. The sub-optimal system capacities in VPH, have made local populations vulnerable to zoonoses and their impact, thus elevating health and economic risks in a globalized world, through the formation of disease "hotspots".⁵ For example, India has the world's largest livestock population. The sector has been exhibiting an annual growth of 4.6%, and an ever increasing demand for and emphasis on livestock production. However, with nearly 80% of the sector being managed in small-holder farms operating in informal marketing conditions and close proximity to animals, the scenario exacerbates vulnerabilities on the human-animal interface, with wide-ranging implications and therefore the need for an adequate and appropriate VPH response.⁶

Evolution of veterinary public health capacity-building – major milestones

While VPH was a part of the veterinary curriculum in India even in the early days of veterinary education, like the veterinary training programme offered by the Indian Veterinary Research Institute, concerted efforts to systematize VPH capacity-building started in 1964, with the establishment of a Division of Zoonoses at the National Institute of Communicable Diseases. This was followed by institution of a master's degree course in VPH at GB Pant University in 1965, and at the All-India Institute of Hygiene and Public Health in 1970. A Division of VPH was established at the Indian Veterinary Research Institute in 1971. The Department of Agricultural Research and Education, under the Indian Council of Agricultural Research (ICAR), was created in 1973, to coordinate, guide and manage research and education in agriculture, including animal sciences in the entire country. The Veterinary Council of India was constituted in 1989, to establish state veterinary councils and maintain registers of veterinary practitioners and related matters. The Indian undergraduate veterinary curriculum underwent its most recent revision in 2008.

Currently, the undergraduate and postgraduate training in veterinary medicine is governed by the Veterinary Council of India and ICAR, respectively. As per their guidelines, each veterinary college has a department of VPH and Epidemiology. Postgraduate training in VPH includes a 2-year Master of Veterinary Sciences and VPH, with the second year dedicated to a master's dissertation. The PhD in VPH is a 3-year programme.

Opportunities in veterinary public health training and capacity building, few and far between

Within these existing frameworks, the structure of VPH capacity-building in India has been fraught with several weaknesses. India has 41 government veterinary schools, with an annual turnover of approximately 2100 veterinary graduates. Twenty-six institutes in the country provide VPH masters' degree and 15 offer a doctoral degree, with around 60–70 public health veterinarians successfully completing the course and 25 scholars awarded doctoral degrees every year.⁷ From the perspective of long-term capacity building, for a country as large as India, this human-resource output is extremely limited, thus making the core capacity to support growing VPH needs grossly underplanned.

The curriculum in undergraduate and postgraduate VPH training includes various aspects of milk and meat hygiene; food safety and public health; veterinary epidemiology and zoonosis; environment and environmental hygiene; etc. However, the approach that is followed is largely pathogen based, with much emphasis on laboratory-based methods and limited focus on disease epidemiology, field epidemiology and study designs. This has led to duplication of efforts between VPH and veterinary microbiology disciplines, and underdevelopment of veterinary epidemiology capacity. Similarly, the focus of research at the postgraduate level is pathogen based, and involves laboratory research with limited focus on epidemiological research and field-based methods.

The extension/internship training opportunities, which are supposed to prepare the graduates to practice VPH in interdisciplinary settings, remain limited in imparting an understanding of cross-sectoral links between various disciplines in VPH, unlike some of the other models.^{8,9} A near-zero interaction with medical colleges, their community medicine departments and schools of public health further compromises intersectoral linkages. The narrow focus also emanates, at least in part, from a limited exposure to programmatic settings. Contrary to the human health aspect, the absence of a mainstream surveillance programme does not allow the development of linkages of veterinary colleges and mainstreaming of VPH education into the broader public health paradigm.

Even the short-term training opportunities in specific domains, for in-service staff to continue their skill development, have been reactive in response to major catastrophic public health events, such as outbreaks of avian influenza, rather than having a strategic focus. Furthermore, from a policy-response

perspective, the inaction in spite of these serious shortcomings indicates a perception of “no unmet need for VPH specialists”. As a result, the VPH community in India has largely remained on the periphery, in academic as well as programme settings, thus drawing graduate students away to tracks with a more secure and predictable career such as clinical sciences. Undoubtedly, the limitations in strategic vision have led to a lack of both quantity and substance of VPH capacity in India.

Urgent need for veterinary public health capacity-building in India: Policy and action

India, with high livestock density, a rapidly growing livestock sector, human population growth, deficient VPH services, weak surveillance and control apparatus, heightened risks for emerging zoonoses, and a much higher demand for veterinary capacity, is yet to realize the importance of VPH in assuring the health and well-being of animals, people and ecosystems. Recent reviews have also established strong associations between poverty, livestock keeping, neglected zoonoses and emerging infections.¹⁰ With India leading on all these fronts, these deficiencies have enormous livelihood and economic implications, as is the case across most of the developing world.

If VPH in India were to attain its goal of disease prevention, poverty alleviation and sustainable livelihoods, through improvements in human and animal health, VPH training must be redefined. A shift in strategic priorities should begin with enunciation of a policy for human-resource development for the veterinary sector and VPH in particular.

Strategic vision through a policy for veterinary public health human-resource development

In the United States, following the Presidential Directive of 2004, “to support higher education and provide capacity-building grants to colleges of veterinary medicine for training in exotic animal diseases, and public health”, the Association of American Veterinary Medical Colleges identified the need to scale up the output of veterinary graduates by 20% ; these graduates were expected to possess a broader set of competencies, including VPH.¹¹ This exercise was followed by an assessment from the National Research Council that recommended a fine-tuning of the policy, taking a longer perspective for defining strategic priorities for the veterinary workforce.¹² An exercise of a similar nature is yet to take place in current times in India.

A VPH human-resource development policy for India should provide the strategic vision and broad framework for building capacity for an effective VPH system in the country that is responsive to national and global health concerns. Catering to long-term core and short-term capacity-building, through a strong academic and continuing education programme, such a policy should be backed by systematic analysis and identification of capacity gaps and competency needs.

Curricular reforms should then follow that make a clear distinction between the public health focus of VPH versus the laboratory focus of veterinary microbiology departments – a model that is well defined in medical schools.

Elevating the profile of veterinary public health: enhancing competencies, providing an enabling learning environment and mainstreaming

Globally, several calls have been made to revise veterinary curricula to meet the ever-changing needs of the sector and to ensure relevance of the discipline in a globalized world. The World Organisation For Animal Health (OIE) has responded to these calls by recommending a basic and advanced set of competencies for graduate “day 1 veterinarians”, based upon the OIE *Performance of Veterinary Services Pathway*.^{13,14} These minimum competencies aim to prepare veterinary graduates to promote global VPH, with applicability to both low- and middle-income countries and high-income countries. Moreover, using standardized frameworks such as these will facilitate collaborations with the human health sector in areas of mutual convergence.¹⁵ Given the increasing integration of India with the global food economy, it will be important for Indian veterinary schools to adopt these guidelines. In addition to the core domains of epidemiology and disease control, these include, communication skills to respond to complex public health issues arising at the human–animal interface. Advanced skills include leadership, management and application of risk analysis, which assume greater importance in low- and middle-income countries, owing to limited capacity of their disease-surveillance systems.¹³

In addition to diversifying content, a reformed VPH curriculum should also incorporate new didactic teaching methods and novel experiential learning exercises that sensitize students in application of VPH. This can include the interface with animal and human health-surveillance systems, participatory surveillance methods, and exposure to established field epidemiology training programmes.¹⁶ Mentorship programmes with faculty and industry collaboration can provide valuable experience to students, while exposing future VPH practitioners to need-based and field-centric approaches. A shift to epidemiological and health-systems and policy research will, further, ensure greater programmatic and policy relevance of research.

Improving intersectoral communication and understanding of the interdisciplinary nature of zoonotic disease diagnosis, prevention and control require education models to be collaborative in nature.¹⁷ The “One Health” movement, which gained momentum in the last decade, has highlighted the importance of transdisciplinary education in addressing EIDs.¹⁸ “One Health” principles and frameworks, as yet formally unrecognized by the Indian VPH and public health policy community must thus be enshrined in Indian VPH human resource development policy.

The recent introduction of the National Animal Disease Referral Expert System is a welcome policy shift towards

setting up a comprehensive epidemiological surveillance system for animal diseases. Similarly, the National Standing Committee on Zoonoses has proposed recruitment of VPH professionals in state surveillance units of the Integrated Disease Surveillance Programme, as well as earmarking of dedicated funds for intersectoral coordination. These are recent attempts made by the Ministry of Health of the Government of India, aiming to institutionalize intersectoral coordination with the VPH community,¹⁹ and provide excellent opportunities for VPH students to train in programme settings in an intersectoral environment. Furthermore, research collaborations between the Indian Council of Medical Research and ICAR, and collaborative platforms such as the Roadmap to Combat Zoonosis Initiative in India, are avenues of transdisciplinary and multisectoral approaches to research on EIDs²⁰ that could benefit VPH capacity-building.

The time to act is Now

VPH capacity-building in India has long suffered from neglect of technical and political leadership, reflected in the policy gaps in building veterinary institutional capacity, thus posing serious threats to global health security. Policy initiatives with strategic focus, and backed by strong and sustained political commitment, as well as advocacy by technical and professional leadership, are necessary in India and rest of the developing world, for the elevation of the profile of VPH and its mainstreaming in public health preparedness and response. Recent EID events, which have galvanized renewed interest in the discipline and its role in responding to these threats, should be seized as an opportunity.

A strategic approach as part of a comprehensive and well-thought-out policy for human-resource development for VPH capacity-building in India, is a pressing need that requires to be pursued by veterinary education advocates and policy-makers. Reviews of curriculum and teaching methodologies at undergraduate and postgraduate levels can be led by veterinary schools in India, which could help prepare India's VPH capacity to meet the challenges of existing and emerging zoonotic risks.

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