Systematic epizootiology: foretaste of a legacy to preventive veterinary medicine in Ibadan, Nigeria

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Summary

Epizootiology curriculum at the University of Ibadan was conceived to lead the unification of educational disciplines, towards concern for total wellbeing of the entire members of the animal kingdom. This objective has been pursued and achieved by committed beneficiaries within the past 35 years, with worldwide spread of the benefits. The aim of this article is to describe what a true epizootiologist should be capable of doing, in a team building approach to preventive veterinary medicine. First, I would ask, what constitute public health surveillance system? What justifications for positive systems? Who is(are) drivers of the system? Who are intellectuals? Who are technocrats? Who are professionals? and why are they important yesterday, today and in the future for the total wellbeing of humans, animals and their common external environment? Integral to these questions is the application of empirical principles to achieving a transition of intellectuals and technocrats into professionals that would drive the public health surveillance system in West Africa. Upon these professionals rest the onus for effective control, prevention and elimination of non-infectious and infectious diseases, including rabies. Achieving total wellbeing for all in West Africa requires the one-health approach. This paper focuses on the translation from the general to systematic epizootiology for the purpose of trans-disciplinary skill-building opportunities, competence in data analysis, synthesis and interpretation for effective communication, ethical decision-making, community-based interventions, and programme planning for preventive veterinary services in Nigeria.

Introduction

In 2005 (almost a decade ago), the European Union (EU) actively supported the Pan-Africa (programme for the) control of Epizootics (PACE). This highlights an obvious realization that the focus of an epizootiologist, among other scientists, is the application of the soundest cognitive knowledge, understanding and wisdom to scientific study, control and prevention of epizoot-
epizootics. Epizootiology, moving a step further from general epidemiology, covering patterns of problems (not diseases alone) in groups, herds, flocks and populations and amongst the various species that make up the biological animal kingdom. Therefore, due recognition and tribute must be paid to the founders of Epizootiology and Epidemiology the world over.

Epizootiology is the science, art, technology and socio-economic jurisprudence of vetting ‘whatever (problems) may befall’ members of the biological animal kingdom (Esuruoso, 1985; Esuruoso et al., 2005). In foresight the curriculum into which this subject was originally conceived was targeted to lead concerns for the kingdom members’ total wellbeing. And in hindsight, that objective has largely been achieved by committed beneficiaries throughout the past 35 odd years at the University of Ibadan, with worldwide spread of the benefits.

This paper describes what the true Epizootiologist who believes in the gospel of being ‘biomedically literate, biostatistically numerate and socio-economically cost-conscious’ (Esuruoso, 1994a,b; Esuruoso and Olugasa, 1997a,b) in the development and practice of veterinary public health and preventive medicine should be capable of doing. They must be the transparent scientists, professionals and managers of human and material resources in timely order, who rever the holistic system and socially healthy approaches of socio-economic jurisprudence (sej) and will always prefer living by the dictates of positive (psej) rather than negative (nsej) socio-economic jurisprudence, towards the Hence, this paper offers a foretaste of Systematic Epizootiology (SE), being a transited paradigm for empirical or Introductory Epizootiology (IE) and its application to the cause of Preventive Veterinary Medicine (PVM). It seeks to integrate core teaching of PVM and real life situations (Esuruoso and Olugasa, 1997b) while emphasizing the following objectives the following objectives:

- Illustrate the limitations of conventional science of epizootiology in solving communal problems through community engagement.
- Show SE utilizes empirical principles of epizootiology in service delivery.
- Show the turning point from epizootiology as a science to service as a professional career.
- To show the cardinal place of citizen science in SE education in order to achieve the required skills to serve the community from a preventive medicine point of view.

In particular, it is adapted to focus on the case of rabies in West Africa.

**Illustrating the transition from basic to Systematic Epizootiology**

Epizootiology is not an end in itself; it is a means to many ends; with the plausibility of successfully understanding and managing whatever (problem) may befall, has befallen, is befalling and likely to befall members of the kingdom at its various stages. It is a means to One-Health promotion and the actualization of its benefits, especially in the surveillance, control and prevention of the zoonoses.
PVM is therefore a potential means for the promotion of one-health education across West Africa.

In achieving One-Health objectives, Epizootiology embraces a multi-disciplinary approach in rabies prevention and control. The strength of such approach may appropriately be exemplified by several instances which may be cited globally in which the collaboration between veterinarians and physicians achieved improved health service across both fields. For instance, an epidemic in the world’s longest tunnel in Switzerland saw physicians perplexed and unable to diagnose what was responsible for death in this tunnel, it was a veterinarian that did. Till date, Switzerland has come to a great appreciation of one-health (Zinsstag et al., 2012). Systematic review is the key competence displayed or exhibited by this veterinary professional. It is an expertise that must depict a professional Epizootiologist.

Systematic epizootiology (SE) is the second stage of the means to many ends that would eventually lead to the cause of PVM for ‘whatever may befall …’ members of the kingdom – headed by man, to the glory of God. In our concept, epizootiology is about total wellbeing. It is not an *homocentric* subject but addresses community needs using basic principles similar to the application of triangulation and circumlocution to see where two divergent paths meet, often at the centre of their common point.

Hence Epizootiology has a place for fitting every discipline. An inherent challenge however has always been to find a common meeting point for intellec-

tuals, technocrats and the professionals. An intellectual may have crystallized conceptualization of general community concerns. A technocrat is primarily driven by cognitive problem-solution mindsets, going beyond possession of intellectual capability (Esuruoso and Olugasa, 1997a). SE seeks to find a common point of convergence of intellectuals and technocrats through systematic review to achieve solution-oriented profession-alism.

Rabies investigation within a community may be approached as human problem, or animal problem. What is novel is to integrate both teams of investigators into a unified rabies surveillance system. Rabies can be eliminated by interventions in animals and humans together, coming from two medicines to achieve one health. Such comparative assessments can be made only if human and animal health problems are investigated as a single socio-ecological disease system. Appropriately we ask: Why are the physicians and the veterinarians in Nigeria not meeting. A starting point will be the unification of surveillance systems of communicable disease between humans and animals coupled in a single surveillance system informing outbreaks in zoonotic diseases.

**Systematic Epizootiology as a scientific discipline**

“Science is a branch of knowledge requiring systematic study and method, especially one of those dealing with substances, animal and vegetable life and natural laws, natural sciences (e.g. biology, geology) and the physical sciences, (e.g. physics and chemistry.)” (Hawkins, 1985). Resolving health problems, through application of scienti-
fic knowledge in public health surveillance of zoonoses, is key in matters of living and dying for members of the kingdom.

_Systematic Epizootiology (SE)_ is naturally amenable to holistic reasoning soundly, qualitatively and quantitatively. For example for the latter, reasoning/logic paths which are tools provided by the sciences of arithmetic, universal arithmetic (e.g. Boolean algebra), physics, trigonometry and calculus, as already indicated in IE, make pure sense to the insider. But if epidemiology is epidemiology for all species, how does the ‘Doctor of Comparable Medicine’ come to apply the tools of infinitesimal reasoning (in consideration of both the integral and differential attributes of the different members of the kingdom? After all, when our LORD God Almighty (Jehovah El Shaddai, Jehovah Elgibbor), the eternal Creator (Jehovah Elohim) gave man the opportunity as responsibility to name the animals He created (Genesis 2.19,20 & Psalm8.6-8), man did not say these animals are the same. He did not say they should be like him in all particularities. He named them differently (Genesis 2.19,20 & Psalm8.6-8).

If that original man was not supposed to be a veterinarian (member of the bona fide noble profession), he must have been a pre-vet or an animal scientist, or whoever regards the working knowledge and understanding of biology in the area of zoology to be germane to his ultimate calling in life. He even named his spouse ‘Woman’ (Genesis 2.23). He did not ‘Say, we are exactly the same materially and functionally. He recognized the intrinsic and universal (i.e. true) nature of systems. SE recognizes the relevance and importance of ‘variation on a common theme’ and so the integral and differential attributes of the sub-systems of the kingdom.

_Systematic Review component – A driver of Systematic Epizootiology_

Systematic Epizootiology recognizes the relevance and importance of system approach. In this approach one of our key statements is, “In a system, every component or sub-system is important as long as it is playing its role properly and in timely order”.

Hence, in SE point of view, variations in form and function ‘on a common theme’, the integral and differential attributes of the sub-systems of the kingdom are systematically observed. Everything that God made is a system, and there are diffuse and discrete systems. Intrinsic to the understanding of any system is identifying the appropriate questions and finding the answers. This becomes meaningless without the empirical approach to finding answers using systematic tool of expression. However, the ultimate goal is the translation of our findings to solving that which lead to our asking questions in the first place, employing our skills into professionalism through systematic review of our findings.

Concretely, curriculum on Epizootiology at the University of Ibadan incorporates Technical Report writing which focuses on identifying the right questions to ask and presenting the answers in paragraph-theme approach that best capture the findings to diverse audience. What we have not added is the tool of expression of systematic review of issues.
Systematic reviews is a scientific method of generating evidence-based decisions following prescribed protocol (European Food Safety Authority (EFSA), 2010). The importance of a protocol is that it outlines the approach to each step of a review. A group of individuals, including professionals, policy personnel, lay members of the community, epidemiologist, veterinarians, physicians, geographer, molecular biologist, statistician, sociologist, community planners and other subject matter specialists (intellectuals and technocrats) may be included in a systematic review team on a public health issue. This helps the group to receive sufficient stakeholders input from the start into surveillance and control of public health challenge. The team shall help with the conduct of the review. They write develop the protocol.

- Develop clear questions for review. The questions should explicitly cover the issue at hand.
- Conduct literature search (electronic or manual). Identify keywords for accurate search of relevant publications.
- Screening identified publications based on relevance, using pre-defined eligibility profile.
- Collate data extracted from the eligible (most relevant) papers.
- Process and statistically evaluate the data collected.
- Writing a coherent report on your findings and evaluations must be to help reach an informed decision on the review. The report should be presented at a public health stakeholders’ forum.
- If a team leader is identified, the leader should interpret the findings to the lay members of a community serviced.

Therefore, SE portrays professionalism as no longer an amoral issue but as noble that must transit to the reality of our time. Hence, every professional should aspire to be socially healthy based on the merits of character. Such indices of social health include:

- being physically,
- morally,
- educationally,
- spiritually,
- honourable law-abidingly,
- peace-loving and promotingly,
- security consciously and
- relationshiply healthy

Those indices are in the nature of Socio-Economic Jurisprudence (SEJ). They are built into the syllabus of epizootiology, the systematics of which is now being foretold. It is everybody’s choice to choose between positive SEJ and negative SEJ. There lies the choice of those aspiring to or not to enjoy total wellbeing – as is taught in Epizootiology.

So far mainly, emphases are placed on economic buoyancy that defies gravity, and financial opulence that eliminates poverty. It is advisable to include social health considerations in community interventions, without which no group shall enjoy total wellbeing. This approach in Citizen Science (CS) highlights a more sustainable health improvement compared to a strictly academic science point of view.

Thus, the stages in epizootiology legacy bequeathed at the University of Ibadan had been;

- First the foresight (show in the curriculum development):
- Next the Introductory exposition (IE):
- Then the Foretaste – the current effort:
- To be followed by a Systematic presentation
Manifestation of the legacy, so that those who adopt this approach, who are willing, able, capable, empowered and available, may accept the divine grace, and get committed to promoting PVM for the cause of total wellbeing (not only in the anthropocentric and ecological, but) in all the major dimensions and concerns in whatever may befall, has befallen, is befalling ‘members of the Kingdom’, and the edification of all groups and individuals thereof of the animal kingdom.

Conclusion

From the inception, epizootiologist has been presented as including bio-medical, biostatistical and socio-economic, including socio-cultural components that may allude to better understanding through a multi-disciplinary study approach. In over three decades of curriculum development, teaching and research in epizootiology at the University of Ibadan, I have come to the conclusion that beyond biological factors (ecological risks), the human factor, its cultural environment critically influence the delivery of preventive medicine, which must be understood and managed.

It is pertinent to end on a charge to keep this legacy, commended by Dr. James H. Steel, the Assistant Surgeon General of the United States, (often referred to as Mr. Veterinary Public Health) at his invited visit to the Department of Veterinary Public Health and Preventive Medicine, University of Ibadan in 1977. In his report to the Vice-Chancellor of the University of Ibadan, he attested to the quality of course design, teaching, research and services in our department. In view of the rapidly changing world I commend this legacy to the succeeding faculty and staff.

I have high hopes that succeeding Heads of the Department shall continue to make noble impact that the department is known for, improving and surpassing this legacy.

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