



# Complexities in Determining the Fate and Outcome of Animal Diseases

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## Introduction

The diagnosis and prognosis of animal diseases is getting murkier and complicated with the passage of time. A large number of well and not so well documented factors have been incriminated in the progression and outcome of diseases affecting the animals. Many outbreaks resulting in alarmingly high mortality have been reported in the recent past, wherein the exact predisposition, etiology and pathogenesis could barely be determined. Therefore, the need arouses to look into the detailed perspective concerning the complex animal disease scenario.

## Opinion

There is a myriad of etiological factors and determinants, the spectrum of which is ever increasing, but the bodily resources and reactions to respond to them are rather limited. Therefore, many similar and confusing clinical presentations may result from markedly different pathogens and unrelated events. Both infectious and non-infectious agents have been incriminated in causation of animal diseases. Among infectious agents, metazoan and protozoan parasites, fungi, bacteria, mycoplasma, chlamydia, viruses, prions and emerging or new pathogens have been found responsible for outbreaks of diseases in animals.

The scenario of non-infectious diseases is far more complex with many nutritional and managerial factors playing a tandem with infectious agents in determining the fate and outcome of a particular disease. In addition, diseases are also different in different species, breeds and strains of animals as well as depend upon age and sex. Veterinarians have to deal with multiple species of animals right from large animals to smaller ones and from mammals to mollusks, thereby making the understanding of species-specific disease even more complex for them.

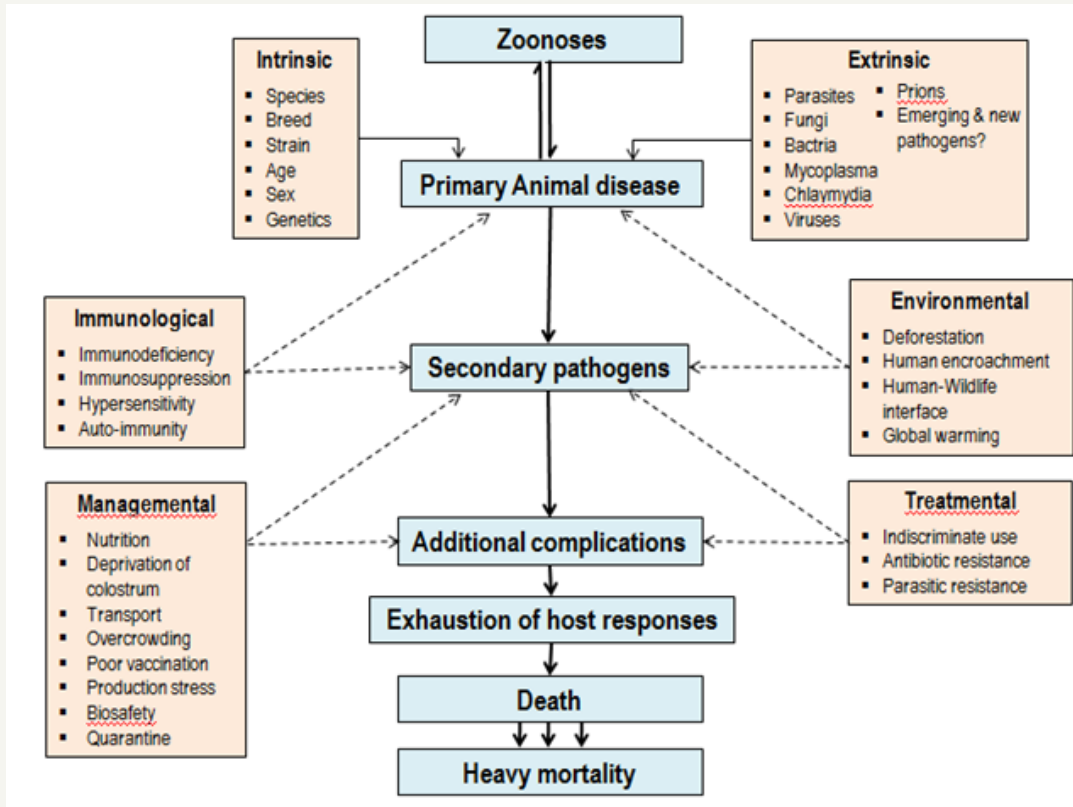
Immunological factors such as immunodeficiency, immune suppression, hypersensitivity and autoimmunity also contribute to the outcome of diseases. Environmental factors like deforestation, human dwelling and encroachments, changing human-wild life

interface and global warming further impact the pathogenesis and epidemiology of animal diseases, particularly vector borne diseases. It is believed that 60-70% of new emerging diseases in humans are coming from animals, but very little is known about reverse zoonoses, in which the climate and environmental effects may have a major role. The indiscriminate and overuse of antibiotics, acaricides and anthelmintics has led to drug resistance and emergence of increasingly resistant pathogens causing protracted and persistent clinical infections, responding poorly to conventional treatments.

Having visited the various factors causing the animal diseases, it becomes impossible to determine which primary or secondary or complicating agent is involved and how a particular animal will respond to this compound situation. It has been noted that in spite of major head way made in the development of new drug therapies and managerial systems, the reports of disease outbreaks with heavy mortality continue to pour in. This is probably due to human greed to extract more and more production from poor animals and that too in unnatural ways (Figure 1).

It is also noted that we have changed not only the habit and habitat of domesticated species of animals, but also dislodged the natural animal wildlife. The concrete jungle instead of natural forest covers has certainly wrecked animal kingdom and is likely to result in serious and unexpected disease havocs in future.

In this increasingly intricate emerging setting, the veterinarians, the para-vets, the farmers, the animal owners and the general public have to think cohesively and find out newer strategies to combat the spread of animal diseases. Prevention is better than cure is an old saying, which holds promise in future too. Predictive epidemiology, improved and long lasting vaccination and herd medicine are likely to be of significant importance in planning future course of action. More so, we as humans have to realize that animals do have their rights and liberty to live in the globe.



**Figure 1:** Factors affecting the fate and outcome of animal disease.