

Burden of Zoonotic Diseases in Venezuela during 2004 and 2005

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Emerging zoonotic diseases have increased in importance in human and animal health during the last 10 years. Each of these diseases has emerged from an unsuspected quarter and has caused severe problems. In countries, such as Venezuela, the burden of these zoonoses has been understudied. In this report we analyze the status of such diseases in Venezuela for the period 2004–2005. During this period a significant number of animal and human cases of these diseases have been found, particularly for rabies, encephalitis, leishmaniasis, and cysticercosis among others. Surveillance needs to be reinforced for these zoonoses.

Key words: zoonoses; surveillance; tropical diseases; Venezuela

Introduction

Emerging zoonotic diseases have increased in importance in human and animal health during the last 10 years, each emerging from an unsuspected quarter and causing severe problems.¹ Many new emerging and re-emerging diseases are caused by pathogens with an animal origin and given ecological and temporal conveying. Effective surveillance, prevention, and control of zoonotic diseases pose a significant challenge² but are of utmost importance. Different ecoepidemiological aspects need to be incorporated, but these, unfortunately, are still not considered by many health agencies, particularly in developing countries. Herein, we describe the burden of selected zoonotic diseases in Venezuela during 2004 and 2005, and we discuss the ecoepidemiological aspects.

Methods

Zoonoses selected for the current analysis are reported to the Ministry of Health and include: rabies, equine encephalitis (EE), leptospirosis, leishmaniasis, cysticercosis, taeniasis, brucellosis, toxoplasmosis, and yellow fever (YF). For statistical purposes, categorical differences analysis was made with the χ^2 test with 95% confidence level (P significant < 0.05), using the software Epi Info v.6.0. (Centers for Disease Control, Atlanta, GA).

Results

During the study period, 3859 cases of suspected zoonotic diseases were recorded (in animals and humans), with 2037 (52.8%) confirmed: 772/2031 in 2004 (38%) and 1265/1828 in 2005 (69%). Leishmaniasis had the highest incidence among this group with 458 cases (22.5%, 3.1% in humans; $P < 0.05$), followed by rabies with 299 cases (14.7%, 0.2% in humans), cysticercosis with 175 (8.6%) cases in humans, leptospirosis with 97 (4.8%) cases

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TABLE 1. Distribution of Selected Zoonoses in Animals and Humans, Venezuela, 2004 and 2005

Disease	2004	2005	Total	%
Rabies in dogs and cats	182	80	262	12.9
Rabies in other species	18	14	32	1.6
Rabies in humans	5	0	5	0.2
Rabies (Total)	205	94	299	14.7
EEE in humans	0	0	0	0.0
WNV in humans	0	0	0	0.0
VEE in humans	0	0	0	0.0
EEE in animals	13	0	13	0.6
WNV in animals	0	0	0	0.0
VEE in animals	9	11	20	1.0
Encephalitis (Total)	22	11	33	1.6
Encephalitis in humans (Total)	0	0	0	0.0
Leptospirosis in humans	37	60	97	4.8
Cutaneous leishmaniasis, humans	16	35	51	2.5
Cutaneous leishmaniasis, dogs	0	2	2	0.1
Visceral leishmaniasis, humans	2	10	12	0.6
Visceral leishmaniasis, dogs	0	393	393	19.3
Leishmaniasis (Total)	18	440	458	22.5
Leishmaniasis in humans (Total)	18	45	63	3.1
Cysticercosis in humans	161	14	175	8.6
Teniasis in humans	18	0	18	0.9
Brucellosis in animals	0	34	34	1.7
Brucellosis in humans	29	10	39	1.9
Toxoplasmosis in humans	14	0	14	0.7
Yellow fever	5	12	17	0.8
All selected zoonoses (Total)	772	1265	2037	100.0

Abbreviations: EEE, East equine encephalitis; WNV, West Nile virus; VEE, Venezuelan equine encephalitis.

in humans, brucellosis with 39 (1.9%) cases in humans, Venezuelan EE (VEE) with 20 cases (1%), Eastern EE (EEE) with 13 cases (0.6%), taeniasis with 18 cases, YF with 17 cases, and toxoplasmosis with 14 cases (Table 1). West Nile virus has not been detected either in animals or humans (for the study period, 2004–2005, neither previously). When comparing the 2004 and 2005 incidence with previous years, a sustained increase is observed (e.g., cumulative cases of rabies for 2003 was 118—106 in dogs, 10 in cats, and two in humans—representing an increase of almost 100%.³ Similar figures are seen for other zoonoses (Table 1).^{4,5}

Conclusion

Zoonoses emergence is related to human population expansion, animal mobilization,

and close animal–human contact. In this interrelationship, species diversity and divergence has been highlighted, which is also based on an ecoepidemiological perspective. The recurring nature of the crises dictates that the veterinary and medical communities consider an ecological vision and there should be improved education of the general public and policy makers; this will help reduce the impact of these important public health problems.¹ The social aspects involved in the emergence of such zoonotic diseases should also be considered⁵ as well as environmental aspects (e.g., climate variability).^{6–8} A Ministry of Health questions whether the public health sector really benefits from different interventions that consider ecoepidemiological and social aspects. Cross-sectoral assessments of interventions consider human and animal health sectors from a societal

perspective. Combining the total societal benefits, intervention in the animal sector saves money and provides an economic argument, which opens new approaches for the control in resource-limited countries with contributions from multiple sectors.^{9,10}

In the case of leishmaniasis, one of the groups with a higher zoonotic burden in Venezuela, we note that 13 *Leishmania* species have a zoonotic nature.¹¹ Leishmaniasis shows a wider geographic distribution and incidence of human disease than was previously known. Environmental, demographic, and human behavioral factors contribute to its changing landscape, including increasing risk factors and scenarios for zoonotic cutaneous and visceral forms.^{6,8,11}

Although neglected in the registry, another emerging zoonotic disease with particular relevance in Venezuela is the American trypanosomiasis. Recent studies have demonstrated that *Trypanosoma cruzi*-infected dogs are found throughout all the geographical regions of western Venezuela, irrespective of their ecological differences.¹² Molecular typing of *T. cruzi* isolates from infected dogs using ribosomal and mini-exon gene markers have revealed the presence of both *T. cruzi* I and *T. cruzi* II lineages.¹² Combined serological, parasitological, epidemiological, and molecular data have been compiled in those studies to call attention to the presence of infected dogs as a risk factor in the maintenance of *T. cruzi* as a source for infection in humans.¹²

Surveillance, analyses, prevention, and control of zoonotic diseases^{5,6,9,13} continue to be of utmost importance, and further epidemiological studies are needed and expected.

Conflicts of Interest

The authors declare no conflicts of interest.

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