LEPTOSPIROSIS IN THE AMERICAS REGION
From an outbreak perspective

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What is Leptospirosis?

Leptospirosis is a zoonotic disease of epidemic-prone, especially after heavy rainfall. It occurs throughout the world and is emerging as an important public health problem, affecting mostly vulnerable populations.

This bacterial disease may present as a mild illness that may progress to a more serious and sometimes fatal disease. Its symptoms may mimic many diseases, such as influenza, dengue and other viral hemorrhagic diseases. Making the correct diagnosis (clinical and laboratory) at the onset of symptoms is important to prevent severe cases and save lives, primarily in outbreak situations.

Previous estimates indicate that there are more than 500,000 cases of leptospirosis each year worldwide. The majority of reported cases have severe manifestations, for which mortality is greater than 10%. The global burden of disease is being estimated by the Leptospirosis Burden Epidemiology Reference Group (LERG), coordinated by the WHO and partners.

Photo: G. Moreno, Nicaragua   Photo: O. Cháves, Nicaragua   Photo: O. Cháves, Nicaragua

Leptospirosis and One Health

Humans usually acquire leptospirosis through direct contact with the urine of infected animals or a urine-contaminated environment. The change of weather patterns such as heavy rains and floods, increase the risk of occurrence of severe epidemics of leptospirosis.

Leptospira interrogans is pathogenic to humans and animals, with more than 200 serologic variants or serovars A wide variety of animal species, both wild and domestic, can serve as sources of infection for humans. The species that are considered to be the most important include feral and peridomestic rodents (rats, mice, voles, etc.) and domestic animals.
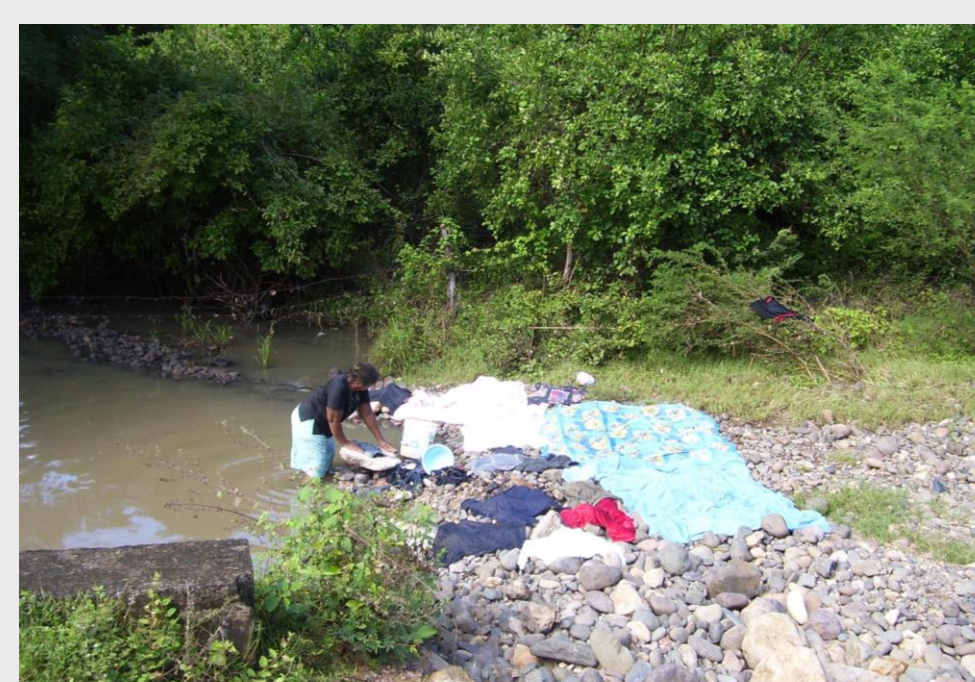

Photo: O. Cháves, Nicaragua   Photo: O. Cháves, Nicaragua   Photo: O. Cháves, Nicaragua

Local studies developed in Central America, a sub-region with many alerts on leptospirosis, presented high prevalence of leptospirosis in livestock and domestic animals. In Nicaragua, leptospirosis prevalence was found in bovine (33-56%), equine (20-76%), porcine (35-51%) and canine (41-51%), among others animals. In Honduras, a study found 62% of positivity for leptospirosis among animals; the ones with the highest percentages were bovines (67%) and equines (63%). Another local study conducted in Honduras presented 34% of prevalence, in this case bovine presented the highest percentages (83%) followed by ovine (72%). These results suggest the importance of leptospirosis in countries where the vulnerable rural populations depend mostly on their animals for income and every day protein intake.

References

Costa, F. et al. Surveillance for leptospirosis in the Americas, 1996-2005: a review of data from ministries of health. *Pan American Journal of Public Health* 32(3), 2012.
Espinoza Rodezno, C. Experience in animal leptospirosis in the Republic of Honduras. Presented during the 'International Meeting of Countries that are Facing Leptospirosis Outbreaks in the Americas. In Managua, Nicaragua, 2012.
FAO, OIE, WHO. Contributing to One World, One Health - A Strategic Framework for Reducing Risks of Infectious Diseases at the Animal-Human-Ecosystems Interface, 2008.
Jiron, W. Animal leptospirosis in Nicaragua. Presented during the 'National Forum of Leptospirosis of Nicaragua'. In Managua, Nicaragua, 2012.
Ko AI et al. Urban epidemic of severe leptospirosis in Brazil. *The Lancet* 354(9181), 1999.
PAHO. Health in the Americas. Pan American Health Organization: Washington, DC, 2012.
Schneider MC et al. Importance of the Animal/Human Interface in Potential Public Health Emergencies of International Concern in the Americas. *Pan American Journal of Public Health* 29(5), 2011.
Schneider MC et al. Leptospirosis outbreaks in Nicaragua: identifying critical areas and exploring drivers for evidence-based planning. *International journal of environmental research and public health* 9(11), 2012.
WHO. Report of the Second Meeting of the Leptospirosis Burden Epidemiology Reference Group (LERG). World Health Organization: Geneva, 2011.

Why is Leptospirosis a priority for the Americas?

About ten million people are affected by natural disasters in the Americas annually, with the majority of them being floods (38%) and storms (38%) (Figure 1).

Since the implementation of the revised version of the International Health Regulations (IHR), which was enacted in June 2007, events considered as a potential public health emergency of international concern (PHEIC) are recorded by the Events Management System (EMS) that supports the IHR. Leptospirosis is among the "top 10 events of infectious hazard" reported in the EMS globally and for the Americas it is the third infectious hazard; confirming the importance of this disease as a potential threat to public health (Figure 2).

Reviewing the HealthMap database that utilizes different online sources for real-time surveillance of emerging public health threats, 530 alerts for leptospirosis were found between 2010 and 2012 worldwide. More than half of them (341 alerts) were located in the Americas, particularly in Brazil (142 alerts), Nicaragua (45) and Argentina (43) (Figure 3). For the Americas, a study conducted by the Pan American Health Organization (PAHO) shows that 70% of PHEIC occurs in the animal/human health interface, which includes outbreaks of leptospirosis (Figure 4).
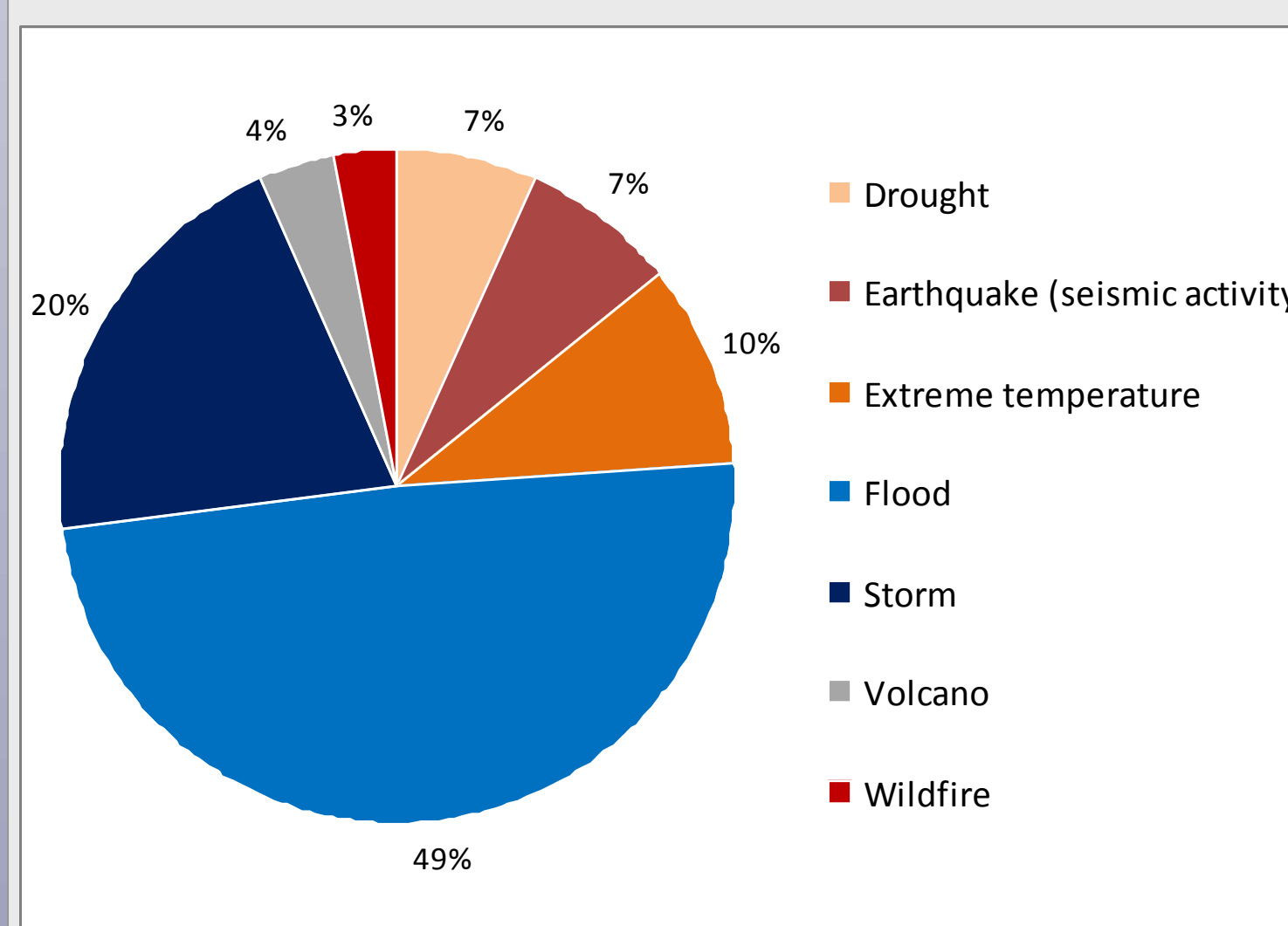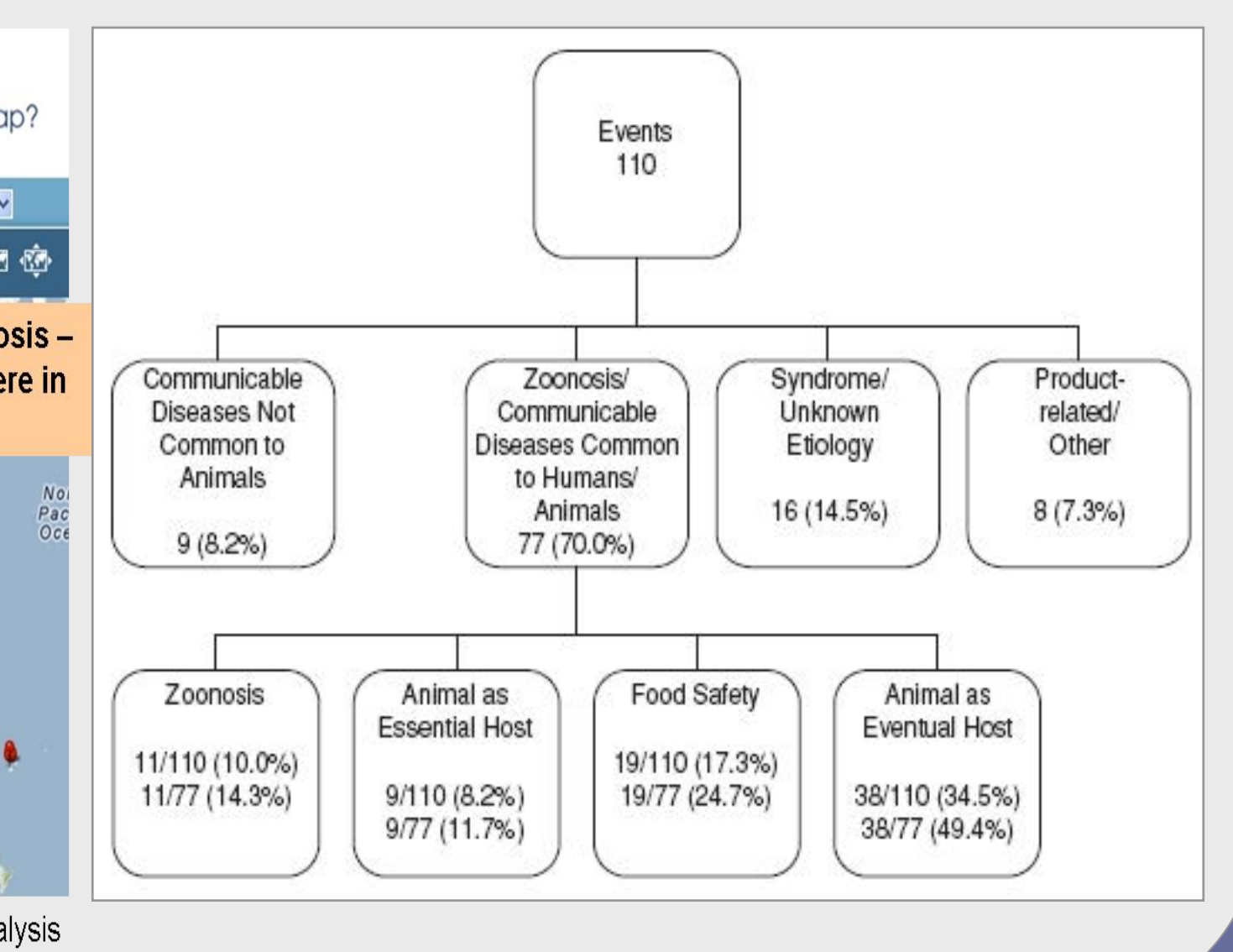
Figure 1. Natural Disasters, Americas, 2010-2012

Figure 2. Top 15 infectious diseases in the EMS/IHR, Americas, Jun 2007 – Feb 2013

Figure 3. HealthMap, Global Alerts of Leptospirosis, Jan 2010 – Dec 2012

Source: *HealthMap* (http://www.healthmap.org), PAHO analysis

Figure 4. Number and proportion of events recorded in the EMS, Americas, Jun 2007 - Dec 2008

Recommendations

Support affected countries to reduce the impact of leptospirosis outbreaks by:

- Identifying major risk areas for disease outbreaks
- Increasing the knowledge of possible drivers
- Further understanding the relationship between animals, humans and ecosystem in the disease cycle
- Strengthening existing preventive measures and studying new ones
- Improving clinic and laboratory diagnosis
- Translating research into operational tools
- Providing guidance and capacity building for outbreak preparedness and response
- Further studying the impact of leptospirosis in livestock
- Raising awareness of the importance of the disease for decision makers

Utilize the One Health framework and the GLEAN initiative to predict, prevent, detect and intervene in leptospirosis outbreaks.