



### 23.047 A 'One Health' approach to the elimination of rabies

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**Purpose:** Globally there are an estimated 55,000 human deaths caused by rabies each year. The majority of cases occur in Africa and Asia, with children under the age of 15 most often infected. More than 99% of cases are transmitted via dog bites (WHO, 2013). Misconceptions about the best means of controlling rabies often result in inhumane dog culling; this is not an effective means of rabies control (WHO, 2013). Risk of transmission in rabies-endemic areas is high, due to an abundance of potentially-infected stray and free-roaming dogs in conjunction with poor local knowledge of rabies management and dog behaviour. Rabies has been effectively controlled in several areas through coordinated mass canine vaccination campaigns when at least 70% herd immunity has been achieved (WHO, 2013). The elimination of rabies is possible through raising awareness about the disease, coupled with humane dog population management and mass dog vaccination campaigns.

**Methods & Materials:** To ensure this is achieved, sharing of knowledge across regions and a 'One Health' approach to animal and human health is critical. Programmes require political support that actively integrates human and animal health agencies. NGOs, such as World Animal Protection, have a key role to play in facilitation. By way of example, World Animal Protection worked with the government of Zanzibar to establish a humane and sustainable dog population management programme as part of their rabies control strategy.

**Results:** Following initial success, the objectives of the Zanzibar dog population management programme were expanded to include rabies elimination through mass dog vaccination. The project integrates public health and veterinary resources with village administrative systems to produce a strong multi-sectorial approach. This has led to rabies being controlled on the island with the programme now transitioning to the elimination and surveillance stage.

**Conclusion:** World Animal Protection supports a holistic approach which sees animal and human health as inextricably connected, and works through cooperation between municipalities and public health and veterinary sectors. By coupling humane dog population management with responsible ownership and mass canine rabies vaccination, conflict between humans and dogs can be mitigated, creating a harmonious co-existence.

### 23.048 Molecular and microbiological detection of *Bartonella* spp. bacteremia in cats

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**Purpose:** Currently, *Bartonella* genus comprises at least 31 species and subspecies, 15 of them are pathogenic to humans. Three species are associated with the largest number of clinical symptoms in human beings: *Bartonella bacilliformis*, *Bartonella quintana* and *Bartonella henselae*. *B. henselae* is the one most frequently associated with human diseases. This specie is considered zoonotic and its transmission is usually related with infected cat scratches. In order to evaluate *Bartonella* spp. bacteremia prevalence in cats from Campinas, Brazil and to isolate a *B. henselae* regional strain, we analyzed blood samples from 112 cats.

**Methods & Materials:** An overview of the diagnostic procedures performed is presented in the Figure 1. The whole blood was collected during spay/neuter surgery and submitted to DNA extraction. A pre-enrichment culture in liquid medium was also performed. An aliquot of

the ten-day culture was seeded in a solid medium supplemented with 30% sheep blood. Another aliquot was tested for PCRs of two different gene targets. Sample isolates obtained from solid cultures were also tested.

**Results:** An overview of the results is presented in the table 1. *B. henselae* DNA was detected in 86 (77%) of blood samples and 56 (50%) of liquid culture samples. In total, bacteremia was detected in 90% (101/112) cats. When the genus-specific ITS conventional PCR was used, *Bartonella* spp. bacteremia was detected just in 31/112 (28%) of liquid culture. Sixteen Gram-negative isolates were obtained from solid medium culture and eleven of them were PCR positive. Some samples were sequenced and three of these isolates demonstrated a 100% homology with *B. henselae* Brazil-1 strain at analyzed ITS region. These isolates were the first samples of this strain to be deposited at a Culture Collection in Brazil. The specie-specific FtsZ nested PCR was positive at least at one sample of bacteremic cats.

**Conclusion:** Our results show that *Bartonella* sp. bacteremia prevalence among cats is very frequent in Campinas, Brazil and suggest that the prevalence of *Bartonella* spp. infection among cats and its consequences for public health remains underestimated. More sensitive diagnostic methods should be used in studying of this infection.

### 23.049 Age-specific seriousness of avian influenza A(H7N9) in the second-wave epidemic in China

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**Purpose:** In spring 2013, a novel avian influenza A(H7N9) emerged in China causing more than 130 human infections mostly in the eastern provinces. The hospital fatality risk of A(H7N9) were about 35% and caused severe illness especially in older patients. In winter 2013-14, a second wave of A(H7N9) began with higher burden in the southern provinces in China. We estimated the relative risk of serious illness of patients aged 65 or above in the second wave of A(H7N9) epidemic, accounting for potential age-specific differences in poultry exposure across different geographic locations.

**Methods & Materials:** A line list of laboratory-confirmed A(H7N9) cases with information on age, geographic location and seriousness of disease (mild/severe) were collated by Chinese Center for Disease Control and Prevention. A recent survey was also conducted in early 2014 on residences in 5 urban cities and 3 rural cities, to measure the age-specific exposure to live poultry. We constructed a statistical model on age-specific risk of serious illness as a function of geographic location and live poultry exposure, stratified by urban and rural areas. The relative age-specific risk seriousness of A(H7N9) was estimated under a Bayesian framework.

**Results:** There were 274 laboratory-confirmed A(H7N9) cases aged 15 or above in China, Oct 1, 2013–May 19, 2014. Of which, 156 were severe cases. The estimated average exposure to live poultry shows small variation across urban areas but exhibited strong age-specific patterns with older people having higher exposure in most cities. We estimated that the risk of serious illness after A(H7N9) infection was 3.1 times higher in patients aged 65 or above (95% credibility interval 2.7-4.1), compared to 5.1 times (95% credibility interval 3.0-8.2) in the first wave of the epidemic.

**Conclusion:** Adjusted for the age-specific and geographical variation in live poultry exposure, we found a slightly lower relative risk of serious illness in laboratory-confirmed A(H7N9) patients in the second wave epidemic. This may indicate improvements in patient management particularly for patients with co-morbid conditions, or change in virulence of the circulating virus strain in Southern China which was divergent from that in the first wave epidemic.