

Serosurvey of Dogs for Human, Livestock, and Wildlife Pathogens, Uganda

To the Editor: Domestic dogs live in close association with humans and livestock, participating in the transmission of diseases of zoonotic, veterinary, and conservation interest (1,2). Most households in Uganda have traditionally kept dogs for hunting and for help with herding, security, and guarding livestock. Most dogs receive no prophylactic measures (e.g., vaccinations) and roam freely; this situation exposes them to pathogens from eating garbage, rodents, and stillborn animals and other carcasses and through inhalation during scent communication. Thus, dogs are a reservoir for

certain pathogens and a useful sentinel for others (3).

In 2011, serum samples were obtained from 116 mixed-breed dogs during a rabies vaccination campaign in and near 3 national parks in southwestern Uganda; the dogs were >4 months of age and were voluntarily brought in by their owners (Figure, Appendix, wwwnc.cdc.gov/EID/article/19/4/12-1143-F1.htm; Table). Two of the parks, Bwindi Impenetrable (BI) and Mgahinga Gorilla (MG), have some of the most biologically diverse tropical forests in eastern Africa and are home to mountain gorillas. The third park, Queen Elizabeth (QE), is home to populations of protected carnivores and ungulates. The parks lie within a densely populated rural landscape; in some areas, the population is as high as 500 persons/km².

Of the 116 sampled dogs, 4 had been vaccinated against rabies by the

authors in 2010 in QE (not included in rabies results), and 11 (all males) had been castrated by local animal healers before serum samples were obtained. The samples were used to test for seroprevalence rates to rabies virus (RABV), canine distemper virus (CDV), canine parvovirus (CPV), *Leptospira interrogans*, *Leishmania* sp., *Toxoplasma gondii*, and *Neospora caninum* (Table). Seroprevalence rates ranged from 20% to 100% (Table). CPV seroprevalence was higher in BI and QE than in MG ($\chi^2 \geq 12.6$, $p < 0.001$); *T. gondii* seroprevalence was higher in BI than in MG (Fisher $p = 0.002$); and RABV seroprevalence was higher in castrated than noncastrated dogs (50% vs. 10%; Fisher $p = 0.005$).

For humans, the domestic dog is the main source of exposure to RABV. The possibility that the presence of the rabies titers in the dog serum samples was due to a previous vaccination can

Table 1. Methodology and seroprevalence for selected pathogens in rural dogs in 3 national parks, Uganda, 2011*

Pathogen	Test, cutoff value, and (ref) or commercial kit	National park							
		All 3 parks		Queen Elizabeth†		Bwindi Impenetrable‡		Mgahinga Gorilla§	
		Sample size	Prevalence, % (95% CI)	Sample size	Prevalence, % (95% CI)	Sample size	Prevalence, % (95% CI)	Sample size	Prevalence, % (95% CI)
Rabies virus¶	FAVN, 0.24 IU/mL (4)	101	19.8 (12.7–28.6)	23	21.7 (9.0–43.3)	56	19.6 (11.0–32.0)	22	16.7 (5.9–37.2)
CDV	c-ELISA, Ingezim Moquillo IgG#	92	100.0 (95.9–100)	30	100 (88.8–100.0)	39	100 (91.4–100.0)	23	100 (85.4–100.0)
CPV	c-ELISA, Ingezim CPV#	92	65.2 (54.9–74.5)	26	80.8 (61.7–92.1)	43	76.7 (61.7–87.6)	23	26.1 (12.0–47.8)
<i>Leptospira interrogans</i> **	MAT, 1:200 (5)	105	26.7 (19.0–36.1)	27	25.9 (12.4–46.2)	55	29.1 (17.9–42.7)	23	21.7 (9.0–43.3)
<i>Leishmania</i> sp.††	c-ELISA, Ingezim Leishmania#	92	19.6 (12.3–29.2)	26	19.2 (7.9–38.3)	43	25.6 (14.6–40.6)	23	8.7 (1.6–27.8)
<i>Toxoplasma gondii</i>	MAT, 1:25 (3)	109	90.8 (83.6–95.1)	30	90.0 (73.7–97.2)	56	98.2 (90.5–99.9)	23	73.9 (52.2–88.0)
<i>Neospora caninum</i>	c-ELISA, 30% (3)	109	27.5 (19.6–36.6)	30	26.7 (13.1–45.0)	56	32.1 (21.2–45.5)	23	30.4 (14.5–52.2)

*ref, reference; FAVN, fluorescent antibody virus neutralization; CPV, canine parvovirus; c-ELISA, competitive ELISA; CDV, canine distemper virus; MAT, modified agglutination test.

†0° 12' S, 30° 0' E (savannah).

‡1° 0' S, 29° 42' E (tropical forest).

§1° 16' S, 29° 40' E (tropical forest).

¶Four dogs vaccinated against rabies in Queen Elizabeth are not included in these results.

#Manufactured by Ingenasa, Madrid, Spain.

**Fourteen serovars were investigated. Of the dogs seropositive, 71.5% were seropositive to 1 serovar and 28.5% to 2 serovars. Reacting serovars were Icterohaemorrhagiae (42.8% of positive dogs), Canicola (39.2%), Pyrogenes (21.4%), Tarassovi (10.7%), and Gryppothiposa and Australis (7.2% each).

††Antibodies probably correspond to contact with *Leishmania donovani*.