Wild Tiger Health Centre Information Sheet

Disease threat: Feline immunodeficiency virus – FIV

Hazard description: FIV is a lentivirus that replicates in T cells, resulting in T-cell-CD4 depletion in domestic cats (Reperant & Osterhaus 2012). Geographical clustering of genetically differing subtypes or clades (A-E) is a feature of FIV (Hosie et al. 2009; O'Brien et al. 2012). Although difficult to predict, clades A, B and D are likely in tiger range states (see (Hosie et al. 2009)).

Host species: Felids. Most wild felid species appear to carry their own FIV viral type, with low rates of transmission between species (O'Brien et al. 2012). Species specific FIV viruses have been detected in lions (Brown et al. 1994), pumas (Carpenter et al. 1996), and Pallas' cat (Brown et al. 2010). However, there is some evidence of cross transmission between species, notably between puma and bobcat in North America (Franklin et al. 2007), between domestic cats and Tsushima leopard cat in Japan (Nishimura et al. 1999), and between domestic cats and guigna (*Leopardus guigna*) in Chile (Mora et al. 2015). There are several explanations for the apparent low rate of inter-species transmission, but it would seem likely that increased human encroachment into wildlife habitat can only increase the risk of spill-over of FIV from domestic cats to free-ranging wild felid species (VandeWoude et al. 2010).

Pathogenesis: FIV in domestic cats causes CD4 depletion leading to immunodeficiency or immune-mediated disease. Clinical signs are therefore widely variable (Hosie et al. 2009; O'Brien et al. 2012).
Species specific infections in wild felids have been historically considered to be largely asymptomatic (Troyer et al. 2011). However, studies of free-ranging lions, pumas and Pallas' cat suggest that view is over-simplistic with evidence of both immunological and pathological effects (Roelke et al. 2006; Roelke et al. 2009; Brown et al. 2010). In particular it has been suggested that infection with different strains of FIV in Serengeti lions may be associated with differing survival rates following CDV infection (Troyer et al. 2011). In addition, the effects of infection of wild felids with domestic cat FIV are difficult to predict. It would therefore seem logical to assume it is potentially pathogenic for tigers.

Diagnosis: Serology ELISA – positive results should be confirmed with Western blot (WB), using non-domestic antigens where possible. Virus isolation, or PCR, but PCR currently only detects clade A.

Vaccination: None.

Free-ranging tiger occurrence: No reports of disease found, although one unconfirmed infection in a free-ranging Amur tiger has been suggested (Naidenko et al, 2018). In a previous serosurvey of 44 Amur tigers none were seropositive (Goodrich, Quigley, et al. 2012).

Distribution: Likely worldwide. Assume present in all tiger range states.

Assumptions: High pathogenic potential in tigers. ELISA/WB test validity is assumed where non-domestic antigens for serology ELISA/WB are unavailable.

Limitations: PCR test is restricted to detection of clade A only. Currently our understanding of full epidemiological picture and potential pathogenicity in wild felid species is incomplete.