Wild Tiger Health Centre Information Sheet

Disease threat: Feline corona virus - FeCoV

Hazard description: Corona viruses are single-stranded RNA viruses – causing a variety of diseases in different species, although many infections may be subclinical (Gavier-Widen *et al.* 2012). Mutation and recombination abilities of coronaviruses coupled with a large genome result in the ongoing emergence of new viruses and new host adaptations.

Feline coronavirus is a common felid virus existing in two forms - relatively non-pathogenic feline enteric coronavirus (FeCoV), and the feline infectious peritonitis virus (FIPV) which causes much more severe pathology (Horzinek *et al.* 2008; Stephenson *et al.* 2013). There are two theories pertaining to the occurrence of FIPV: enteric mutation of FeCoV within a host to FIPV; or circulating distinct FIPV strains (German 2012). Most infections are transient with only a small percentage becoming persistent carriers or chronic viral shedders. The virus can also remain viable in the environment for 2-7 weeks (Horzinek *et al.* 2008).

Host species: Felids.

Pathogenesis: FeCoV transmission is predominantly faeco-oral and infection is generally subclinical or associated with transient self-limiting diarrhoea. However chronic faecal viral shedding may occur post-infection in some individuals. In contrast, FIPV is more pathogenic. There are two recognised forms of the disease, wet (effusive) FIP, and dry (proliferative) FIP. Both arise because of immune-mediated effects; the more common wet form from vasculitis leading to effusions; and the dry form from granuloma formation on serosal surfaces. Clinical signs can be widely variable, complicating diagnosis. Signs of wet FIP include pleural and peritoneal effusions in particular. Signs of dry FIP include abdominal, and notably CNS granulomas (German 2012).

Serological evidence of FeCoV infection has been detected in free-ranging cheetah (Heeney *et al.* 1990; Munson *et al.* 2004; Thalwitzer *et al.* 2010), lion (Driciru *et al.* 2006), Bengal tiger (McCauley *et al.* 2018) and Amur tiger (43%, n=44) (Goodrich *et al.* 2012). FIP has been documented in captive cheetah (Evermann *et al.* 1988), and free-ranging mountain lion (Stephenson *et al.* 2013).

Diagnosis: Feline coronavirus RT-PCR can be an extremely sensitive and specific method of detecting FCoV within samples. FeCoV RT-PCR (or electron-microscopy) of faeces is useful to detect viral shedders; IHC (immunohistochemistry) or IFA (immunofluorescent antibody) are used on intestinal biopsy samples. Serological assays must be interpreted with caution, especially when attempting to diagnose the disease syndrome FIP, and in the light of potential cross-reactivity with other carnivore coronaviruses. A detailed discussion of the diagnostic possibilities and complications can be found in Barker & Tasker, 2000.

Vaccination: None.

Free-ranging tiger occurrence: No reports of disease were found, but serological evidence of exposure has been reported in Amur tigers in the Russian Far East (Goodrich *et al.* 2012) and a single Bengal tiger in Nepal (McCauley *et al.* 2018).

Distribution: Appears to be widespread, assume present in all tiger range states.

Assumptions: None.

Limitations: None.