

Word Count: 506

The public health and management issues surrounding Hendra Virus and potential outbreaks in Australia.

Public education surrounding the Hendra Virus needs to be improved in order to control the virus spread. Hendra virus poses a serious risk to individuals, the health system and horse owners. Pathogenicity, transmission between common hosts and lack of viable vaccines are all contributors to this risk.

The Hendra Virus (HeV) that was first isolated from an outbreak in Brisbane during 1994 is a virus of high risk to human health with a case fatality rate of 57% (Field and Kung, 2011). Human infection of HeV has only been observed through direct contact with infected horses (Ksiazek et al., 2011). While relatively recent research has determined that the Australian flying-foxes, genus Pteropus, are the natural host (Field and Kung, 2011; Tulsiani et al., 2011). It is believed that horse infection occurs due to contact with excreted material from the bats, at which point the infected horses can infect other horses and humans through direct contact (Field and Kung, 2011).

As mentioned earlier the Australian flying-foxes are the natural host of HeV. Anti- HeV antibodies have been identified in all 4 species of Australian Pteropus at significantly high frequencies of 47% in Queensland (Field et al., 2001). It has been determined that infected bats can pass on the virus to horses and in the laboratory to other animals including cats, pigs and guinea pigs, through material including faeces, urine and placenta (Eaton et al., 2006; Tulsiani et al., 2011). There has been seen to be a correlation between the density of bat and human populations and because there is currently no ethical way to control the spread of the virus through bats this poses a significant health concern (Plowright et al., 2011).

Figure 1: Correlation between continually occupied flying-fox camps and the level of human population density. Also marked are the places of previous Hendra spill-over events. (Plowright et al., 2011)

Joshua Deerain 27/10/13 3:02 PM

Comment [1]: This report uses elements of the WRITE method. Here the real purpose of the report is outlined. Following this is a series of paragraphs which cover the back ground information. In the last 2 paragraphs the need for improved awareness is readdressed.

Joshua Deerain 27/10/13 2:54 PM

Comment [2]: Each paragraph focuses on one topic and is arranged in a logical order.

Joshua Deerain 27/10/13 2:51 PM

Comment [3]: Rule of 3's is used here to amplify the message being communicated that Hendra poses a serious risk.

Joshua Deerain 27/10/13 2:51 PM

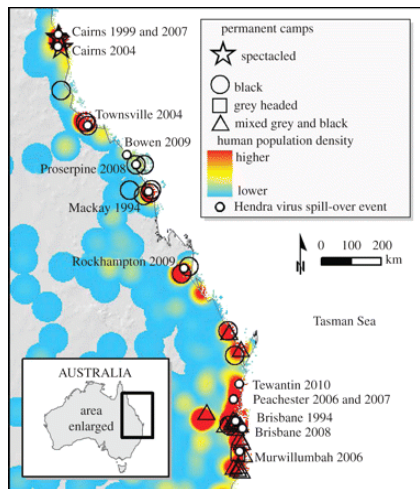
Comment [4]: Rule of 3's used here again.

Joshua Deerain 27/10/13 2:48 PM

Comment [5]: Clear explanation of the important aspect of HeV

Joshua Deerain 27/10/13 2:49 PM

Comment [6]: Rule of 3's continually used throughout report



At this stage there is relatively little information known about HeV interaction with its natural host leading to problems in controlling the spread of the virus through bats. Because of this and the close correlation between bats and humans, infection prevention in alternative hosts becomes the main focus. Human infection only occurs through close contact with infected horses.

A number of government bodies have produced a set of guidelines in order to reduce the risk of horses becoming infected. These guidelines all revolve around reducing the risk of horses coming into contact with flying-foxes (health, 2009; Queensland, 2011). There are also a number of different guidelines available that outline protocols to prevent transmission to humans through infected horses. The main focus of these is personal protective equipment (health, 2009; Queensland, 2011). Because the virus has an incubation period of 6-10 and can be transmitted while infected horses appear asymptomatic it is essential that these protocols be always in place (Tulsiani et al., 2011).

The high CFR and the lack of vaccine against Hendra make it a serious risk to human health. Public awareness about the virus and compliance with animal handling guidelines are two ways to reduce the risk of another outbreak. Furthermore continued research into the virus will eventually provide a better understanding of the transmission of the virus and potentially a vaccine.

References

- Eaton, B.T., Broder, C.C., Middleton, D., Wang, L.F., 2006. Hendra and Nipah viruses: different and dangerous. *Nature reviews. Microbiology* 4, 23-35.
- Field, H., Kung, N., 2011. Henipaviruses — unanswered questions of lethal zoonoses. *Current Opinion in Virology* 1, 658-661.
- Field, H., Young, P., Yob, J.M., Mills, J., Hall, L., Mackenzie, J., 2001. The natural history of Hendra and Nipah viruses. *Microbes and infection / Institut Pasteur* 3, 307-314.

health, t.c.f.f.s.a.p., 2009. Hendra Virus Infection, in: biologics, I.f.i.c.i.a., health, t.c.f.f.s.a.p. (Eds.).

Ksiazek, T.G., Rota, P.A., Rollin, P.E., 2011. A review of Nipah and Hendra viruses with an historical aside. *Virus research* 162, 173-183.

Plowright, R.K., Foley, P., Field, H.E., Dobson, A.P., Foley, J.E., Eby, P., Daszak, P., 2011. Urban habituation, ecological connectivity and epidemic dampening: the emergence of Hendra virus from flying foxes (*Pteropus* spp.). *Proceedings. Biological sciences / The Royal Society* 278, 3703-3712.

Queensland, B., 2011. Hendra virus information for horse owners. Department of Employment, Economic Development and Innovation.

Tulsiani, S.M., Graham, G.C., Moore, P.R., Jansen, C.C., Van Den Hurk, A.F., Moore, F.A., Simmons, R.J., Craig, S.B., 2011. Emerging tropical diseases in Australia. Part 5. Hendra virus. *Annals of tropical medicine and parasitology* 105, 1-11.