IS KHV ZOONOTIC? ASSESSING THE ZOONOTIC POTENTIAL OF AQUATIC ANIMAL DISEASES.

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Definitions

A zoonotic disease is a disease that can be transmitted from animals to people or vice versa

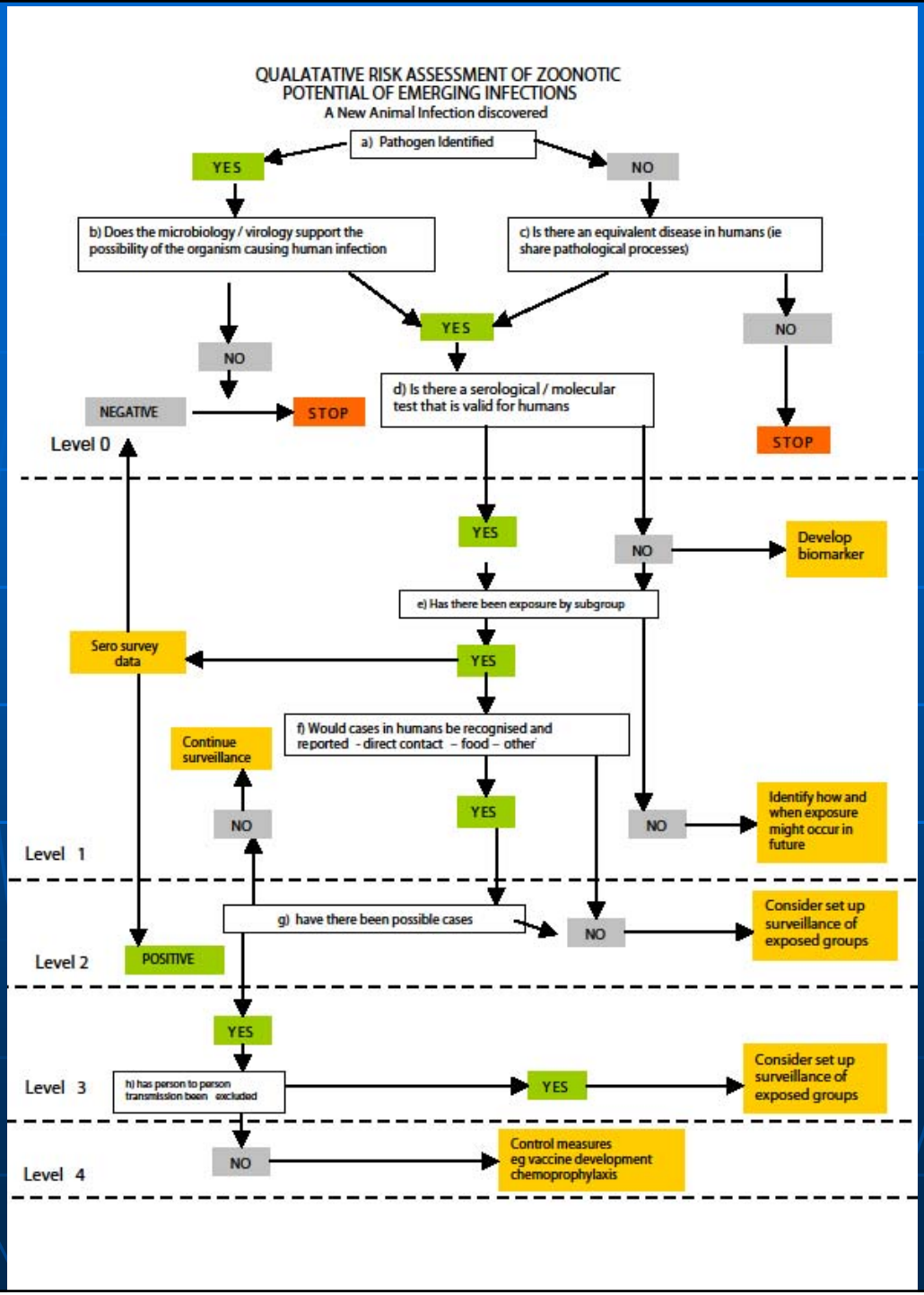
An emerging disease is one that has appeared in a population for the first time, or that may have existed previously but is rapidly increasing in incidence or geographic range

Qualitative Risk Assessment Questions

- What is the distribution?
- What is the prevalence?
- What is the aetiology?
- What is the epidemiology?
- What clinical disease is caused?
- Are diagnostic tests available?
- Is there any zoonotic potential?
- What are the potential sources of human exposure?
- Would zoonotic disease be detected?

Qualitative Risk Assessment Answers

- Distribution - Worldwide
- Variable prevalence
- Aetiology – Cyprinid herpes virus
- Epidemiology – Fish to fish
- Clinical disease - in fish/ Unknown humans possibly lytic, possibly local
- Diagnostic tests – Fish see OIE Manual
- Zoonotic potential – unknown but potential?
- Human exposure – widespread - food, angling
- Zoonotic disease probably not detected

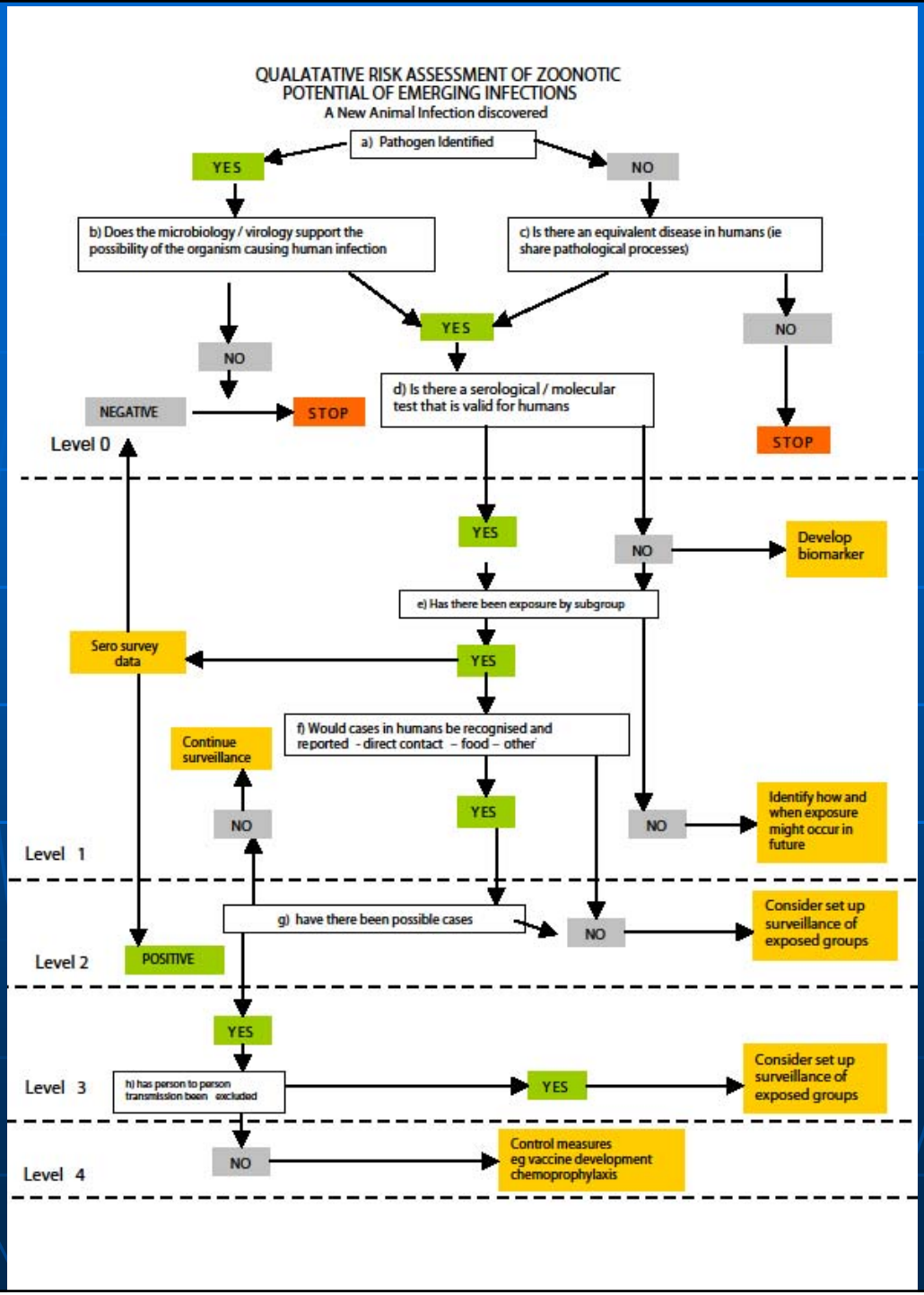


Risk Assessment One

Risk Assessment Stage		Question	Notes	Outcome
Level 0	A)	Pathogen identified?	Koi Herpes Virus/ CyHv3	Yes
	B)	Does the microbiology/virology support the possibility of the organism causing human infection	Herpes are considered host specific. The known temperature of KHV replication is below 30°C. There is considerable phylogenetic distance between mammalian HVs and the CyHVs. Currently they are in separate clades.	No
Outcome Level 0				
Action		**No action required**		

Risk Assessment Two

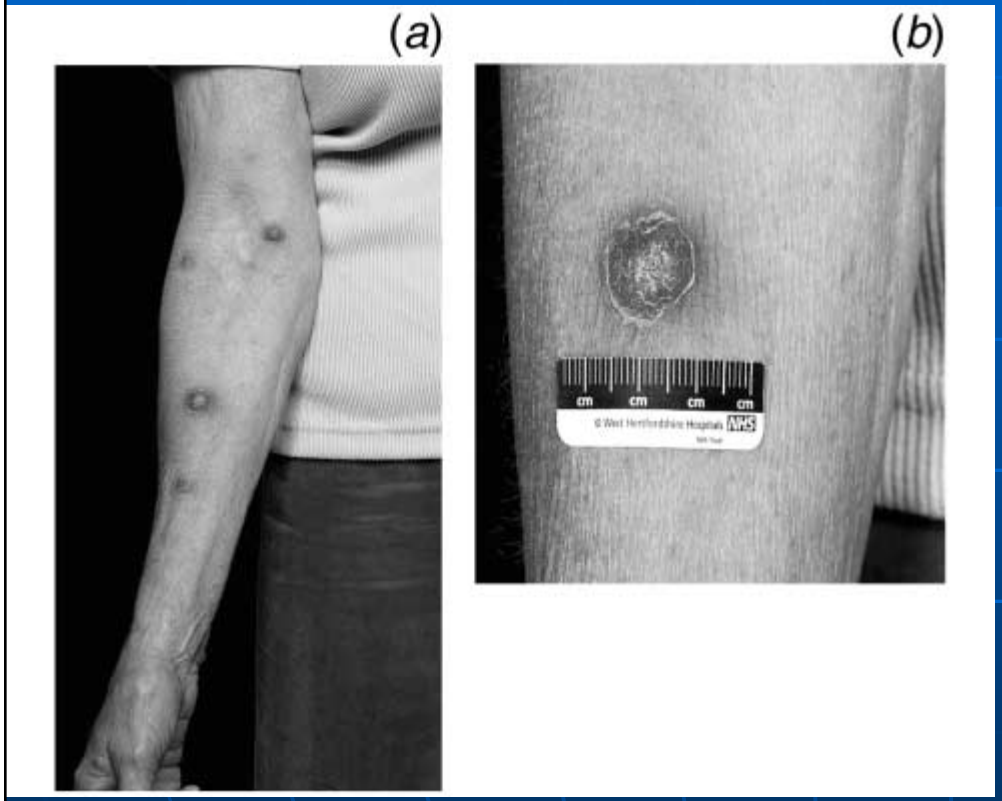
Risk Assessment Stage		Question	Notes	Outcome
Level 0	**A)**	Pathogen identified?	Koi herpes virus	Yes
	B)	Does the microbiology/virology support the possibility of the organism causing human infection	Herpesviruses are considered host specific but herpes B virus is known to be zoonotic. The genetic distance between human HVs and CyHVs is considered large. However, aquatic caliciviruses have bridged the gap from aquatic to terrestrial viruses and significant phylogenetic distances (*Essbauer and Ahne 2001*). Can CyHv 3 be considered similar to other Herpes?	Yes
	D)	Is there a serological/molecular test that is valid for humans?	There is no specific test in humans for KHV but there is molecular testing available for this virus.	Yes
	E)	Has there been exposure by a subgroup?	Human exposure is likely to have been widespread either through farming and use of common carp for food, handling of carp during angling or the keeping of koi as pets	Yes
	F)	Would cases in humans be recognised and reported?	Herpes B virus causes encephalitis with 50% mortality. Infection is caused by bite or scratch wounds from infected monkeys or through abraded skin (*Brown 1998*). KHV loses infectivity after two days at 35^{o}C (*Perelberg et al 2003*) so if it were to cause human infections it is likely to be on the extremities and possibly self limiting. Although speculative, transmission could be by aerosol or scratch from fin rays whilst handling the fish. Recognition and reporting would depend on the type of disease caused.	Yes?
	G)	Have there been possible cases?	KHV has been recognised in the since 2000 and been present since at least 1996. There have not been any recognised cases of human infection. One case of “unexplained” hepatitis after exposure in UK	No (?yes)
Outcome: Level 2				
Action		Investigate if KHV grows in human cell lines at permissive temperatures which might indicate infectivity. Consider setting up surveillance of exposed groups.		



A case of what?

- There are roughly one to two cases of this in people a year in the UK
- There have been rare cases of fatal infections recorded

A case of what?



(Abood & Kang. Trigger thumb in a fish owner. J R Soc Med, **99**, 370)

- It has the ability to hide behind many guises, which can make diagnosis difficult.
- Trigger Finger
- It does not restrict itself to superficial structures.
- Tenosynovitis, bursitis, gout, rheumatoid arthritis, and even destructive polyarthritis.
- The unwary may treat these with local steroids and make
- matters worse.
- Treatment is excision and chemotherapy.

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Discussion

- Case 1 is cowpox, Case 2 is M. Marinum
- Both are recognised zoonoses but due to “infrequent” cases they are rarely seen making diagnosis difficult.
- One person in the UK suffered hepatitis of unknown cause after high exposure to KHV.
- Rarely seen diseases/clinical syndromes are frequently misdiagnosed.

Conclusion

The first rule of diagnosis is always diagnose the commonest but when a disease is rarely encountered or considered unlikely then a diagnosis may be missed

Although very highly unlikely it may still be possible that KHV is zoonotic

Do we underestimate the incidence of zoonoses in aquatics

?