HM Government

The Human Animal Infections and Risk Surveillance (HAIRS) Group

2017 report

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Preface

Formed in 2004, the Human Animal Infections and Risk Surveillance (HAIRS) group is a multiagency, multidisciplinary cross-government horizon scanning and risk assessment group covering England, Wales, Scotland and Northern Ireland. This report summarises the work done by the group in 2017, and is a collaborative publication from members representing the following agencies:

- Public Health England
- Department for Environment, Food and Rural Affairs
- Department of Health and Social Care
- Food Standards Agency
- Animal and Plant Health Agency
- Health Protection Scotland
- Scottish Government
- Public Health Agency, Northern Ireland
- Department of Agriculture, Environment and Rural Affairs, Northern Ireland
- Public Health Wales
- Welsh Government

The work of the group prior to 2017 is summarised in previous reports, available at: https://www.gov.uk/government/collections/human-animal-infections-and-risk-surveillance-group-hairs

HAIRS members: end of 2017

ENGLAND

Public Health England (PHE)

Dilys Morgan (Chair)	Head of Emerging Infections and Zoonoses
Amanda Walsh (Secretariat)	Senior Scientist, Emerging Infections and Zoonoses
Catherine O'Connor (Secretariat)	Scientist, Emerging Infections and Zoonoses
Kevin Brown	Deputy Director of Virus Reference Department
Jolyon Medlock	Head of Medical Entomology and Zoonoses Ecology

Department of Health and Social Care (DHSC)

Trudy Netherwood	Health Protection Policy

Animal and Plant Health Agency (APHA)

Steve Wyllie	Veterinary Head of One Health
Andrew Frost	Veterinary Advisor
Cameron Stewart	Veterinary Officer and Specialist in Veterinary Public Health
Paul Duff	Leader of Diseases of Wildlife Scheme
Alan Wight	Veterinary Investigation Officer, Project Deputy, Non-statutory zoonotic diseases project
Annemarie Green	Veterinary Advisor
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Helen Roberts	International Risk Monitoring

Department for Environment, Food and Rural Affairs (Defra)

Fin Twomey	Head of Animal Public Health

Food Standards Agency (FSA)

Manisha Upadhyay	Senior Scientific Officer, Microbiological Risk Assessment
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Department of Agriculture, Environment and Rural Affairs (DAERA)

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Gill Hawkins	Consultant in Health Protection

Scottish Government

Rebecca Miller	Veterinary Advisor

WALES

Public Health Wales (PH WALES)

Robert Smith	Clinical Scientist (Zoonoses)

Welsh Government

Arjen Brouwer	Veterinary Advisor, Chief Veterinary Office

Former HAIRS members: 2016-2017

Sally Wellsteed	Department of Health and Social Care
Colin Macaldowie	Deputy Chief Veterinary Officer, Scotland
Adrienne Mackintosh	Veterinary Advisor, Chief Veterinary Office, Wales
Jesus Gallego	Deputy Chief Veterinary Officer, Scotland

Executive summary

Since 2004 the Human Animal Infections and Risk Surveillance (HAIRS) group have met on a monthly basis to discuss emerging issues affecting human and animal health in the UK and internationally. During this period, topics and incidents considered by the group have ranged from high profile outbreaks to rare disorders affecting restricted populations.

During 2017, vector-borne diseases continue to be discussed and assessed by the group. There was another identification of *Aedes albopictus* mosquito by PHE's active mosquito surveillance. This time eggs and larvae were found in mosquito traps at Ashford International truck stop during July. Control measures were rapidly implemented and no further evidence of *Ae. albopictus* mosquitoes was found during enhanced surveillance of the area. This again demonstrates the risk of invasive mosquitoes becoming established in England, and the importance of an active mosquito surveillance programme for the early detection and management to prevent this happening. In addition, the further spread of *Culex modestus* in the Thames Estuary and along the Essex coast resulted in enhanced human and animal surveillance for West Nile Virus infections in those areas.

The public health threat from *Mycobacterium bovis* in animals continues to be discussed by the group, as new gaps in guidance and policy emerge.

This report describes these and many other topics discussed by the HAIRS group during 2017, and includes the outcomes of those discussions.

I would like to give thanks to the experts who made significant contributions to this work and to members of the group for their contributions during the year.

Dilys Morgan
August 2018

Major topics and incidents discussed by the HAIRS group

The following section includes a summary (in alphabetical order) of the major topics and incidents discussed by the HAIRS group during 2017. Both subjects newly presented to the group (resulting from an incident, disease trend, or new research) and subjects previously discussed (for which new evidence, information or data became available which might have resulted in previous risk assessments being re-examined) are included in this section. Some topics will be under regular consideration by the group and while this report covers only discussions undertaken in 2017, further discussions will be included in the 2018 report.

***Aedes albopictus* – further detections in the UK**	
Status: Update	Raised by: PHE
External expert consulted: Alexander Vaux, PHE	

Image of *Aedes albopictus* mosquito from CDC Public Health Image Library

Since the first European detection of *Aedes albopictus* in Italy in 1990, the species has expanded its distribution and is now established in 28 European countries [1]. Once established in a region, its primary mode of dispersal is via movement of adult mosquitoes in vehicles along highway networks. In this way, the species has been able to establish populations in northern France, Belgium and the Netherlands. As a consequence of the establishment of this species in Europe autochthonous cases of dengue (DENV) and chikungunya (CHIKV) infection have been reported [2]. In the summer of 2017, France and Italy reported autochthonous transmission of CHIKV, in the Var department, France [3] and the Lazio and Calabria regions, Italy [4]. The two events were distinct, involving viral strains of different origin.

Ae. albopictus was detected in both 2016 and 2017 in Kent as part of joint PHE and local authority surveillance efforts. In Folkestone (2016) and Ashford (2017) *Ae. albopictus* eggs were found in ovitraps set out at truck stops [5,6]. Larvae were also found in the trap at Ashford. The eggs and larvae were identified using morphological and molecular methodology. PHE worked closely with the local authorities, establishing an incident management team to co-ordinate control and communication. Enhanced surveillance did not find any further evidence or different lifestages at the sites, indicating importation of a single inseminated female. Both sites are predominantly used

by goods transportation trucks which can travel across continental Europe, and the service station at Folkestone also provides a coach terminal.
The local authorities led mosquito control efforts to minimise chances of the mosquito becoming established. These involved setting-up a 300m control area around the truck stop boundary, working with the site owners to remove mosquito aquatic habitats, visiting residential premises within the buffer area and advising them of ways to minimise mosquito aquatic habitats, and treating standing water with a mosquito control product. Litter picking and drain clearance were particularly important at the truck stop, in order to remove small containers of water suitable for mosquito larval development.

Outcome

As in 2016, the detection of *Ae. albopictus* in 2017 was not surprising given its proven ability to move via vehicular transport within Europe. The UK's ability to remain free of established populations of *Ae. albopictus*, and therefore free of locally acquired cases of dengue or CHIKV, is contingent on robust surveillance to detect invasive mosquitoes or imported cases of disease. A rapid, effective control response to invasive mosquitoes is crucial. To reflect this latest UK detection and the French and Italian outbreaks of CHIKV in 2017, both the Zika virus and CHIKV risk assessments were updated.

Risk assessments

Qualitative assessment of the risk that Zika virus presents to the UK population: https://www.gov.uk/government/publications/hairs-risk-assessment-zika-virus

Qualitative assessment of the risk that chikungunya virus presents to the UK population: https://www.gov.uk/government/publications/hairs-risk-assessment-chikungunya-virus

References

1. Medlock J, Hansford K, Schaffner F, Versteirt V, Hendrickx G, Zeller H, et al. (2012). A review of the invasive mosquitoes in Europe: ecology, public health risks, and control options. Vector Borne Zoonotic Dis. 2012; 12:435–47. https://www.ncbi.nlm.nih.gov/pubmed/22448724
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3. Calba C, Guerbois-Galla M, Franke F, Jeannin C, Auzet-Caillaud M, Grard G, et al. Preliminary report of an autochthonous chikungunya outbreak in France, July to September 2017. Euro Surveill. 2017;22(39). https://www.eurosurveillance.org/content/10.2807/1560-7917.ES.2017.22.39.17-00647
4. Venturi G, Di Luca M, Fortuna C, Remoli ME, Riccardo F, Severini F, et al. Detection of a chikungunya outbreak in Central Italy, August to September 2017. Euro Surveill. 2017;22(39). https://www.eurosurveillance.org/content/10.2807/1560-7917.ES.2017.22.39.17-00646

5. Medlock JM, Vaux AGC, Cull B, Schaffner F, Gillingham E, Pfluger V, Leach S. (2017). Detection of the invasive mosquito species *Aedes albopictus* in southern England. Lancet Infect Dis. 2017;17:140 https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(17)30024-5/fulltext
6. Public Health England (2017). Mosquito treatment in Ashford, Kent https://www.gov.uk/government/news/mosquito-treatment-in-ashford-kent

Avian influenza – European outbreaks in 2017 (H5N8 and H5N6)

Status: Update	Raised by: Defra/APHA

In 2016/2017, Europe experienced the largest epizootic of avian influenza in over a decade associated with the highly pathogenic avian influenza (HPAI) strain A(H5N8). Over a thousand outbreaks in poultry farms from almost all EU Member States were reported and several thousand wild birds also tested positive.

Image of backyard chickens by Steven L Johnson CC 2.0

During this period in the UK, 12 cases of H5N8 were reported in kept poultry and more than 40 findings were recorded in wild birds. Of the poultry cases, six were in commercial holdings and six in smallholder premises (fewer than 50 birds). This was the first time avian influenza had been confirmed on smallholder premises in the UK. It was also the first time the gamebird sector was involved, and three linked premises in Lancashire had pheasants that tested positive.

Awareness of HPAI was high amongst poultry keepers in the UK during this period and APHA dealt with over 150 suspected incidents reported across England, Wales and Scotland. As part of the prevention measures, housing orders were put in place from late December 2016 across the UK, which required all outdoor birds to be housed or netted. Eggs and meat could still be marketed as free range for 12 weeks, after which they were relabelled as temporarily housed birds. In September 2017, the UK was declared free from HPAI H5N8.

During 2017 a new strain was detected in Europe, this time an H5N6 virus which was a reassortant of two strains circulating in Europe: the H5 from the H5N8 HPAI virus and the N6 from a low pathogenicity virus. Sequencing suggested this was another highly pathogenic virus but as there were no mutations suggesting reduced avian or increased mammalian affinity, there should be a very low risk to public health. This new strain was discussed regularly at HAIRS meetings. In December 2017 the first wild bird findings and poultry cases of HPAI H5N6 were reported in the Netherlands which prompted the UK Government to review the risk level. Given the low level of infection on the continent, the risk level remained at medium for an incursion in wild birds into the UK.

Outcome

The evolving HPAI situation was monitored closely by animal health members of HAIRS during the 2016/2017 season. The European Union Reference Laboratory at Weybridge was at the forefront of sequencing the virus isolates and providing the evidence for the very low zoonotic potential of the H5N8 strain found in the UK and the H5N6 strain circulating in Europe. In collaboration with APHA, PHE assessed the public health risk of H5N8 [1] and the European lineage of H5N6 [2] as very low and issued appropriate advice.

References

1. Public Health England (2017). Avian influenza A(H5N8) in the UK: risk assessment. https://www.gov.uk/government/publications/avian-influenza-ah5n8-risk-assessment
2. Public Health England (2017). Avian influenza A(H5N6): risk assessment. https://www.gov.uk/government/publications/avian-influenza-ah5n6-risk-assessment
3. Defra (2017) Avian Influenza: UK now disease-free but Chief Vet urges vigilance https://www.gov.uk/government/news/avian-influenza-uk-now-disease-free-but-chief-vet-urges-vigilance

***Brucella canis* – imported canine cases**	
Status: Update	Raised by: PHE

Brucella canis is the cause of canine brucellosis and can result in abortions, stillbirths, epididymitis, orchitis and sperm abnormalities. Affected organs extend beyond the reproductive tract. Dogs that have been spayed or neutered may develop other conditions such as ocular disease and discospondylitis. In dogs, *B. canis* is usually acquired by ingestion or through the genital, oronasal and conjunctival mucosa. Routes of infection include venereal transmission and around parturition. Puppies can be infected *in utero*, and nursing puppies can be infected from milk.

B. canis appears to be globally widely distributed, including the Americas, Africa, Asia and some European countries. *B. canis* is zoonotic, but is of lower virulence to humans than other *Brucella* species such as *B. melitensis*, *B. abortus* or *B. suis.* Although Brucellae are notifiable and reportable animal diseases the obligation to report is species-specific, and there is no obligation to report either suspicion of disease or positive test results in dogs to the UK veterinary authorities.

In early 2017, *B. canis* was confirmed in a blood culture from a dog which had been imported from Romania to the UK a year previously [1]. There had only been one confirmation of *B. canis* infection in the UK prior to this, although a suspected case with

suggestive serology had recently been investigated in Scotland, without confirmation. Later in 2017, another culture-confirmed case of *B. canis* infection was diagnosed, this time in a dog imported from Bosnia [2]. In total, APHA were made aware of five imported canine cases of *B. canis* in 2017.

Outcome

Importation of dogs from eastern Europe was recognised as an increasing trend in the UK, and that the possible presence of unrecognised brucellosis in asymptomatic animals presents a potential threat to public health. Awareness was raised among colleagues in the human health and, in particular, the veterinary community who should consider this a potential differential diagnosis, especially in imported dogs presenting with reproductive disease or joint issues.

Following these recent incidents, APHA, PHE and the Brucella reference laboratories worked together to produce public health guidance for laboratories and veterinarians, and highlighted the risk assessment processes for laboratory exposures.

Additional information

PHE Brucella reference unit:

- laboratory and clinical services
- exposure assessment and flowchart
- factsheet for laboratory exposure
- Brucellosis – factsheet for veterinary exposure

References

1. Morgan, J., Pintos, V., Rys, H., Wake, T., Grace, K., Perrett, L., Whatmore, A. & Edwards, D. (2017). *Brucella canis* in a dog in the UK. *Vet* Rec, 180, 384-385 http://veterinaryrecord.bmj.com/content/180/15/384.2
2. Whatmore, A., Perrett, L. & Friggens, M. (2017) Second UK isolation of *Brucella canis*. *Vet Rec,* 180, 617 http://veterinaryrecord.bmj.com/content/180/25/617.3

Brucella suis – imported raw pet food

Status: Update	Raised by: PHE, APHA
External expert consulted: Scott Reaney, APHA	

In November 2017 HAIRS were informed of a canine case of Brucella infection in the Netherlands, not as a result of the expected *B. canis*, but a highly pathogenic strain of *Brucella suis* biovar 1 [1]. This biovar was described in a 2009 European Food Safety Authority report as "highly pathogenic causing severe disease in human beings" [2].

Dog eating raw meat
by This Year's Love
CC2.0

As this organism was not thought to be endemic in the Netherlands, alternative sources were sought, and the infection was traced to raw, frozen pet food made from imported hare meat from Argentina that had been fed to the dog.

The Dutch authorities then notified the five other Member States that had received batches of this pet food product from the Dutch distributor. This included the UK, which had received three small consignments over the previous year. The UK distributor had received an alert from the Dutch supplier and issued a recall notice to their customers two weeks earlier, but had not informed the UK authorities.

Although it was not certain that the batches imported to the UK were contaminated, in view of the pathogenicity of the organism UK authorities decided to take a precautionary approach. A cross-government group including Defra, APHA, FSA, and PHE worked on the response, and liaised closely with Dutch officials.

Those potentially at risk included:

- pets fed on the raw pet food
- owners of the pets and other family members
- veterinarians who might be presented with a sick animal
- pigs - if sick pets were walked across livestock holdings or contaminated pet food was accidentally fed to pigs

Communications included a joint "Warn and Inform" letter from PHE and APHA to owners and pet shops that had purchased the food, and an APHA letter to the Veterinary Record to alert private vets to the potential risk [3]. APHA offered to test blood samples from dogs fed the pet food at no charge. The pig industry were also alerted, checks were made that there were no other imports of this nature, and discussions initiated with the Pet Food Manufacturers Association.

Outcome

The implicated product is no longer available in the UK and to date the group has not been made aware of any illness in humans or pets in the UK resulting from this incident. It does however, illustrate the potential risks of feeding raw pet food, particularly when it is imported and may contain serious pathogens that are exotic to the UK.

The feeding of a raw food diet to pets is an emerging trend in the UK. In 2018, the group continued to discuss in detail the public health implications of raw pet food and these discussions will be covered in the 2018 HAIRS report.

References

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2. EFSA (2009). Scientific Opinion of the Panel on Animal Health and Welfare (AHAW) on a request from the Commission on porcine brucellosis (*Brucella suis*). The EFSA Journal, 1144, 1-112 https://www.efsa.europa.eu/en/efsajournal/pub/1144
3. Frost, A. (2017). Feeding of raw *Brucella suis*-infected meat to dogs in the UK. Veterinary Record, 181, 484 http://veterinaryrecord.bmj.com/content/181/18/484.1

***Mycobacterium bovis* - outbreak in hunt kennels**	
Status: New	Raised by: PHE & APHA
External expert consulted: Scott Reaney, APHA	

Mycobacterium bovis infection in non-livestock animals is a topic of regular consideration for the HAIRS group. Since the outbreak of *M. bovis* infection in cats in Berkshire in 2012/2013 in which transmission of infection from cats to humans was recorded [1], the group is advised by members of any unusual incidents of *M. bovis* infection which may have public health implications.

Foxhound by Thowra_uk CC2.0

In February 2017, the group was made aware of a suspected outbreak of *M. bovis* in a working foxhound kennel in Berkshire, England [2]. A small number of hounds had displayed non-specific clinical signs such as weight loss/loss of condition. Lesions suggestive of mycobacterial infection were identified in kidney and heart tissue at post mortem examination. Of 164 hounds tested, *M. bovis* was culture-confirmed by APHA laboratories in samples from 14 of the hounds [3].

PHE's Thames Valley and East of England Health Protection teams carried out risk assessments for all individuals with close contact with the affected hound pack, including veterinary and kennel staff. Tuberculosis screening was offered to individuals with significant contact with affected hounds. No active disease was found in any human contacts of the hounds.

One hypothesis for the source of infection in this hunting pack was that the hounds may have been infected by contaminated meat. Hunting kennels are permitted under Article 18 of the Animal By-Products regulation (EC1069/2009) to be fed meat from fallen stock animals that have not gone through meat inspection but did not show signs of diseases communicable to humans or animals. The source of infection for the hunting pack was never identified.

Outcome

This was the first outbreak of *M. bovis* infection in working foxhounds in the UK and was monitored closely by the group. Although no confirmed human cases were associated with this outbreak, risk assessments performed by local health protection teams highlighted the many practices commonly undertaken in foxhound kennels where potential exposure could occur. The group recognised that existing guidance for the public health management of *M. bovis* infection in animals includes guidance for confirmed infection in companion animals and livestock. Working hounds, such as in this outbreak, fall into neither category. Therefore, in outbreaks such as this, individually tailored risk assessments are required to assess the potential impact on human health.

Since this incident, additional measures have been put in place to strengthen controls on meat fed to dogs from recognised kennels or packs of hounds [4].

References

1. HAIRS (2013). HAIRS risk assessment: *Mycobacterium bovis* in cats – public health risk assessment. https://www.gov.uk/government/publications/hairs-risk-assessment-mycobacterium-bovis-in-cats
2. Are hunting dogs spreading bovine TB? (2017) Veterinary Record, 180, 583 http://veterinaryrecord.bmj.com/content/180/24/583
3. O'Halloran, C., Hope, J,C., Dobromylskyj, M., Burr, P., McDonald, K., Rhodes, S., Roberts, T, Dampney, R., *et al*. (2018) An outbreak of tuberculous due to *Mycobacterium bovis* infection in a pack of English Foxhounds (2016-2017). Transboundary & Emerging Diseases https://onlinelibrary.wiley.com/doi/full/10.1111/tbed.12969
4. Defra (2017). Authorisation A6 - Derogations from Animal By Product controls under Regulation (EC) 1069/2009 and Commission Regulation (EU) 142/2011. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/650731/abp-exemptions-201710.pdf

Pets	
Status: Update	Raised by: PHE

The Non-Commercial Movement of Pet Animals Order 2011 (as amended by the Non-Commercial Movement of Pet Animals (Amendment) Order 2014) is a domestic piece of legislation that sets out certain delivery and enforcement arrangements for implementing the EU pet travel scheme within Great Britain (the similar Non-Commercial Movement of Pet Animals Order (Northern Ireland) 2011 applies in Northern Ireland). The main purpose of the GB 2011 Order is to create a mechanism to facilitate the non-commercial movement of pet animals (cats, dogs, and ferrets) into GB without the need for quarantine, while protecting GB from the threat of rabies and the *Echinococcus multilocularis* tapeworm.

Article 22 of the Order establishes a requirement that the Secretary of State completes a review of the 2011 Order within five years of it coming into force. Defra conducted a public consultation from 15 September until 27 October 2016 to help inform the post-implementation review [1]. In total, there were more than 90 responses to the consultation [2].

Issues related to the pet travel scheme have been extensively discussed in the HAIRS group over the years and concerns fed back to the Defra Pet Travel Policy Team. The group therefore thought it appropriate to respond to the consultation and a response was agreed and submitted on behalf of the group.

Outcome

The group agreed that HAIRS should continue to press for re-instatement of tick controls, since risks that were identified prior to derogation leading to termination of controls were now being realised. PHE's Medical Entomology group have run a tick surveillance scheme since 2005, and there has been a notable increase in ticks associated with imported dogs since 2012 coinciding with the relaxation of tick treatments on travelling dogs (see page 21). Many of the ticks identified are recognised vectors of exotic animal and human infections.

In addition, it was considered that it is crucial that controls remain for *E. multilocularis*. The tapeworm would pose a serious risk to both human and animal health if it entered the UK. If introduced, eradication would be unlikely and it was important to protect the UK as the incidence of *E. multilocularis* appears to be increasing across mainland Europe.

Implementation of the 2011 Order over the last 5 years was felt to have had the unintended consequences of a substantial growth in legal movement of animals accompanied by a similar growth in the number of illegally imported animals. There can be little doubt that the trigger for this has been a perceived reduction in the stringency of the rules since implementation of the order. The impact in terms of human health concern and anxiety, increased pressure on local authorities and Trading Standards resources, health and animal health agencies, and of animal welfare, has been significant.

A summary of responses was published in June 2017 [2]. The group awaits the publication of the Post Implementation Review that will include recommendations of amendments to the current policy based on the responses to the consultation.

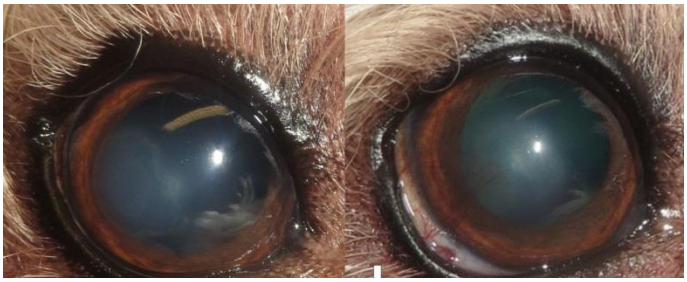
References

1. Defra (2017) Consultation on the Review of The Non-Commercial Movement of Pet Animals Order 2011 (as amended) https://consult.defra.gov.uk/exotic-disease-control/petorderreview/
2. Defra, Welsh Government & the Scottish Government (2017). Review of the Non-Commercial Movement of Pet Animals Oder 2011 (as amended). Summary of responses. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/655978/pet-animals-consult-sum-responses.pdf

Thelazia callipaeda (Oriental eye worm) – first UK detections

Status: New	Raised by: PHE

In late 2017, *Thelazia callipaeda* was reported in the UK for the first time in three dogs [1]. All three had returned or were imported from mainland Europe (Romania, Italy, and France) in 2016, and had been fully compliant with Pet Travel Scheme (PETS) requirements.



***Thelazia callipaeda*-associated pathology in the right eye of one of the imported UK cases (a) showing superficial ventrolateral corneal ulceration at the initial point of referral, and (b) re-epithelialisation 21 days after removal of a single male *T. callipaeda*. Images credits: Lyndsay Moss & Chris Dixon, Veterinary Vision**

Known as ‘eye worms’ because the adult worm lives in the eye and associated tissues, larvae of *Thelazia* species can be found in animal hosts including cattle, horses and dogs. Some species are known to infect humans. The worm is transmitted by non-

biting flies that feed off ocular secretions, and in Europe the main vector is *Phortica variegata*.

When the flies feed on tears (lachrymal secretions) of an affected host animal, larvae are ingested and following completion of the next stage of their lifecycle they become infective. Infection is then transmitted to another host when the fly feeds again on lachrymal secretions. There is no direct animal-to-human, or human-to-animal transmission. Thelazia species are found worldwide, but T. callipaeda is the only species of concern in Europe, where it affects both animals and humans.

The vector Phortica variegata is present in the UK, but has a limited distribution (ancient oak forests in Gloucester, Kent and Berkshire) [2]. Onward transmission in the UK could theoretically occur if P. variegata were able to feed on an infected imported animal, and other animals were present after the parasite life cycle had been completed (~14days). There is therefore a potential risk that imported T. callipaeda could become enzootic in those parts of southern UK where P. variegata is found. Despite animal infections being recorded across Europe, human infections remain rare. When it occurs, human thelaziosis is usually a mild infection, and removal of the worm results in cure.

Outcome

The HAIRS group reviewed the risk *Thelazia*, particulalry *T. callipaeda,* presents to the UK public and determined that the probability of human infection in the UK is considered to be negligible to very low. The potential impact on human health is therefore regarded as very low.

The Dipterists Forum, a British entomological society, has been requested to inform PHE of any future or unusual sightings of *P. variegata*. Awareness has been raised by articles in veterinary and optometry press.

References

1. Graham-Brown J, Gilmore P, Colella V, Moss L, Dixon C, Andrews M, *et al*. (2017) Three cases of imported eyeworm infection in dogs: a new threat for the United Kingdom. *Vet Rec*;181(13):346.) http://veterinaryrecord.bmj.com/content/181/13/346
2. APHA (2018) *Thelazia callipaeda* information note. March 2018. http://apha.defra.gov.uk/documents/surveillance/diseases/thelazia-callipaeda.pdf

Other topics and incidents discussed by the HAIRS group

The following section includes a summary (in alphabetical order) of other topics and incidents discussed by the HAIRS group at monthly meetings during 2017. Discussions on some topics will continue in 2018 and will be covered in the next HAIRS report.

Chronic Wasting Disease – further detections in Europe	
Status: Update	Raised by: Defra/APHA

Chronic Wasting Disease (CWD) was first reported in Europe in March 2016 in a wild reindeer from Norway. Since that date, surveillance in cervids (wild and farmed, shot and found dead) has been carried out. In 2017, more cases (11 in total) were reported not only in reindeer from the same region that had cases in 2016, but also a similar atypical form of CWD was detected in moose and a red deer [1].

Image of lone Reindeer by Western Arctic National Parkland CC 2.0

In May 2017 preliminary experimental results of infection of Cynomolgus macaques suggested CWD could be transmitted to primates through ingestion and intra-cranial injection, resulting in disease [2]. These results were contrary to previous experimental data. Subsequently in 2018, the results of a long term US study have found no evidence of transmission of CWD to Cynomolgus macaques [3].

Outcome

Consequently, PHE, FSA, and APHA each carried out risk assessments [4] to determine the risk of CWD introduction into the UK, risk of spread to wildlife, risk from occupational exposure, and risk from consumption. The risk assessments concluded that there was overall a very low risk to public health from infection being present in the UK. However, there was a medium level of uncertainty of this assessment because of the low level of surveillance in cervids in the UK, the preliminary experimental data and the new atypical CWD findings in moose and red deer. The group continues to monitor the situation carefully as surveillance is undertaken in cervid populations in the Northern EU countries.

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***Culex* mosquitoes – UK distribution update**	
Status: Update	Raised by: PHE
External expert consulted: Alexander Vaux, PHE	

Historically, *Culex modestus*, a vector of West Nile virus (WNV) in Europe [1], was considered absent from the UK, and as a result WNV risk assessments were based on the lack of this key bridge vector. However, since 2010 the PHE mosquito surveillance scheme has identified *Cx. modestus* in North Kent and in a limited number of locations in Essex [2-5].

Image of *Culex modestus* mosquito by Marcello Consolo CC BY-NC-SA 2.0

Cx. modestus is now known to have a widespread distribution in the Thames Estuary and along the Essex coast in coastal habitats. A joint APHA and PHE project in 2013 collected and tested mosquitoes for WNV, but all were found to be negative [4]. Mosquito surveillance will continue to be conducted to monitor the distribution of this species, with focus on suitable East Anglian habitat to ascertain its distribution along the East coast.

Outcome

The December 2017, the HAIRS group published an updated qualitative risk assessment for West Nile virus in the UK population due to the continued outbreaks of the disease in Europe and neighbouring countries, as well as the expansion of *Cx. modestus* in southern England [6].

As a result PHE has raised awareness of testing of potential human cases of WNV in the areas where *Cx. modestus* has been identified.

Risk assessments

Qualitative assessment of the risk that West Nile virus presents to the UK population: https://www.gov.uk/government/publications/hairs-risk-assessment-west-nile-virus

Additional information

PHE: West Nile virus: epidemiology, diagnosis and prevention

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Imported ticks in the UK – increasing trends	
Status: Update	Raised by: PHE
External expert consulted: Kayleigh Hansford, PHE	

The travel and trade of animals facilitates movement of important tick vectors globally. Such movements can introduce pathogens of medical and veterinary importance along with competent tick vectors, which may result in local disease transmission. Importation of ticks into the UK via dogs, horses, migratory birds, reptiles and even humans has been well documented, but recent evidence from Public Health England's Tick Surveillance Scheme (TSS) suggests that the number of importation events may be increasing [1].

Image of female *Amblyomma rotundatum* tick removed from a marine toad imported from Suriname

During 2017, the group reviewed TSS data collected between 2008 and 2016. In total, 65 TSS records (represented by 399 ticks) were associated with animals with a recent history of travel outside of the UK. Of these, 36 records (representing 190 ticks) were of ticks not indigenous to the UK (Table 1). Since 2009, recorded numbers have steadily increased to around 20 per year. 45 confirmed tick importations were recorded from 15 different countries in Africa, Europe, North and South America and Southeast and Western Asia.

Table 1: Public Health England's Tick Surveillance Scheme records of non-indigenous ticks associated with animals with a recent history of travel outside of the United Kingdom between January 2008 and September 2016.

Species	No. of records	Males	Females	Nymphs	Larvae	Total
Amblyomma rotundatum	1	0	1	0	0	1
Dermacentor variabilis	1	1	0	0	0	1
Haemaphysalis elliptica	1	1	1	0	0	2
Hyalomma lusitanicum	1	0	1	0	0	1
Hyalomma marginatum	1	1	0	0	0	1
Rhipicephalus sanguineus	30	55	67	52	2	176
***Rhipicephalus* species**	1	0	8	0	0	8
Total	36	58	78	52	2	190

The risk posed by importation events varies considerably and it cannot be assumed that non-native imported tick species present more or less of a risk compared with species already endemic to the UK. Resident species imported into the UK on animals may be able to establish more easily compared to non-native species due to a range of factors including climate suitability [2,3].

Key themes appear to be emerging from the last 10 years of data, including rehomed dogs from Cyprus and Spain being associated with *Rhipicephalus sanguineus* importation (with some subsequent house infestations) [4], and canine travel to France being associated with the importation of multiple tick species and canine illness. In

addition, more unusual importation routes have been uncovered, such as the importation of *Hyalomma lusitanicum*, a known vector of Crimean Congo haemorrhagic fever virus, on a dog [5].

Outcome

The group agrees that promoting awareness of ticks and tick-borne disease risk during and after travel or animal importation is needed [6,7], particularly if ticks of medical and veterinary importance may be coming into the UK at a potentially increasing rate. Continued surveillance and in addition, screening of imported ticks for pathogens of medical and veterinary significance, will further the understanding of tick-borne disease risk in the UK. Discussions on this topic will continue in 2018.

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Psittacosis – public health guidance

Status: Update	Raised by: HPS

Macaw by Martin Pettitt CC2.0

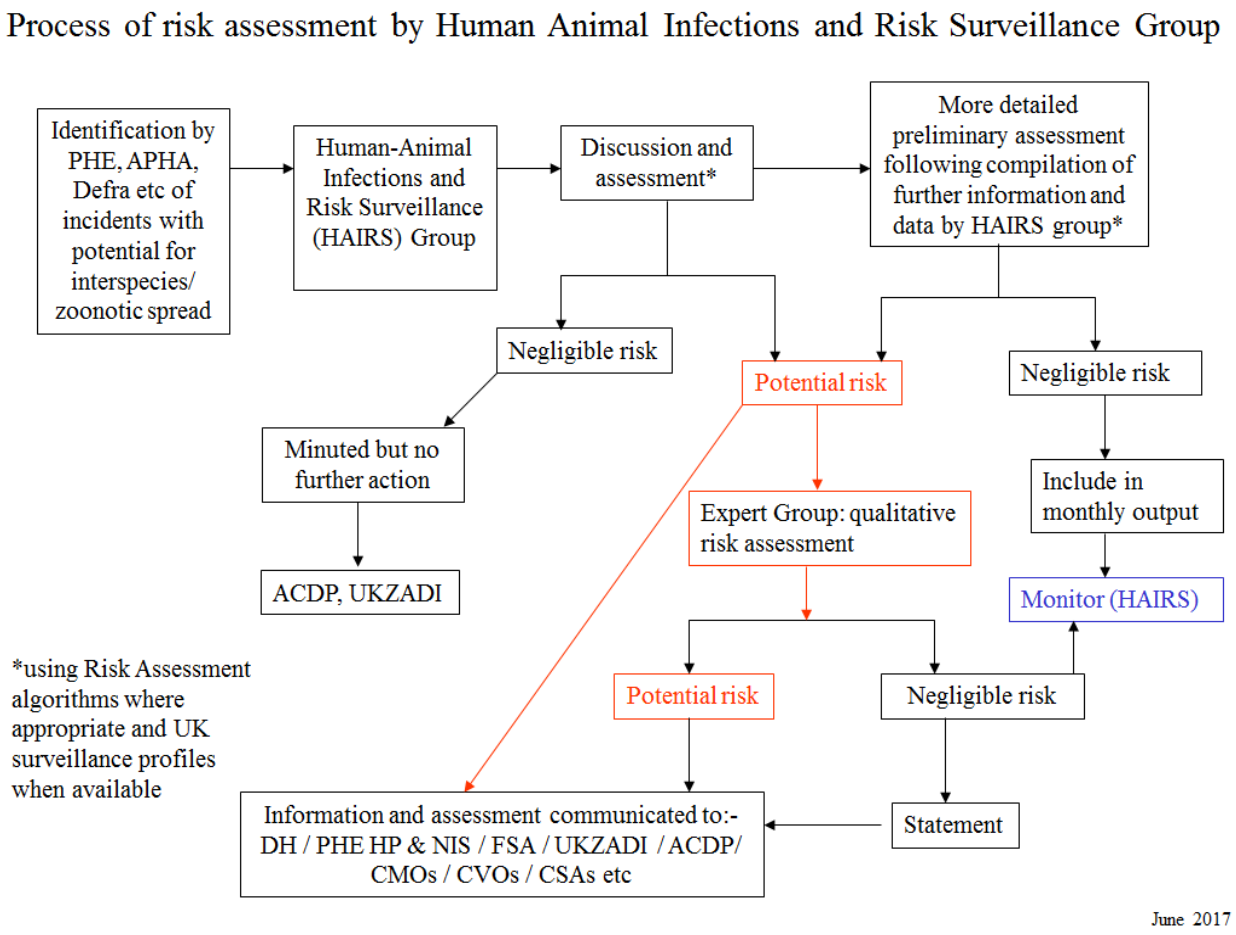
Psittacosis (also known as ornithosis, avian chlamydiosis and parrot fever in birds) is caused primarily by the bacterium *Chlamydia psittaci*. In humans, the disease typically presents with influenza-like symptoms and can lead to severe pneumonia. It is often mild or moderate, but can be severe especially when untreated in elderly or immunocompromised individuals. The main source of human infection is pet caged birds. Owners of parrots and other psittacine birds, pet shop staff and pigeon fanciers are the groups at most risk.

In 2016/2017 the group discussed two particular incidents of psittacosis in parrots in Scotland with both household and pet shop exposures. Concerns were raised by members regarding the lack of available guidance to advise incident control teams on how to manage such incidents.

Outcome

A subgroup of the HAIRS group composed of members from HPS, APHA, and PHE are preparing a guidance document covering actions required by both animal and public health in the event of a psittacosis incident with human exposures. Further discussion will continue in 2018.

Appendix A: HAIRS risk assessment process



ACDP=Advisory Committee on Dangerous Pathogens, APHA=Animal and Plant Health Agency, CMO=Chief Medical Officer, CSA=Chief Scientific Advisor, CVO=Chief Veterinary Officer, Defra=Department for Environment, Food and Rural Affairs, DH=Department of Health, FSA=Food Standards Agency, HAIRS=Human Animal Infections and Risk Surveillance Group, NIS=National Infection Service, PHE=Public Health England, UKZADI=United Kingdom Zoonoses, Animal Diseases and Infections group.

Appendix B: Glossary of abbreviations

ACDP	Advisory Committee on Dangerous Pathogens
APHA	Animal and Plant Health Agency
CHIKV	Chikungunya virus
CWD	Chronic Wasting Disease
DAERA	Department of Agriculture, Environment and Rural Affairs, Northern Ireland
Defra	Department for Environment, Food and Rural Affairs
DENV	Dengue virus
DHSC	Department of Health and Social Care
EFSA	European Food Safety Authority
EM	*Echinococcus multilocularis*
EU	European Union
FSA	Food Standards Agency
GB	Great Britain
HAIRS	Human Animal Infections and Risk Surveillance group
HPAI	High pathogenic avian influenza
HPS	Health Protection Scotland
NHS	National Health Service
PETS	Pet Travel Scheme
PH Wales	Public Health Wales
PHE	Public Health England
TSS	Tick surveillance scheme
UK	United Kingdom
UKZADI	UK Zoonoses, Animal Disease and Infections group
WNV	West Nile virus