1

Overview of the update

- Equine Influenza (EI)
- Equine Viral Arteritis (EVA)
- Surveillance of Equine Strangles

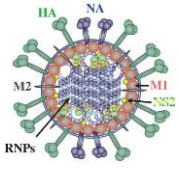
2

Overview of the update

- Equine Influenza (EI)
- Equine Viral Arteritis (EVA)
- Surveillance of Equine Strangles

3

Equine flu: H3N8 family tree since 1963!

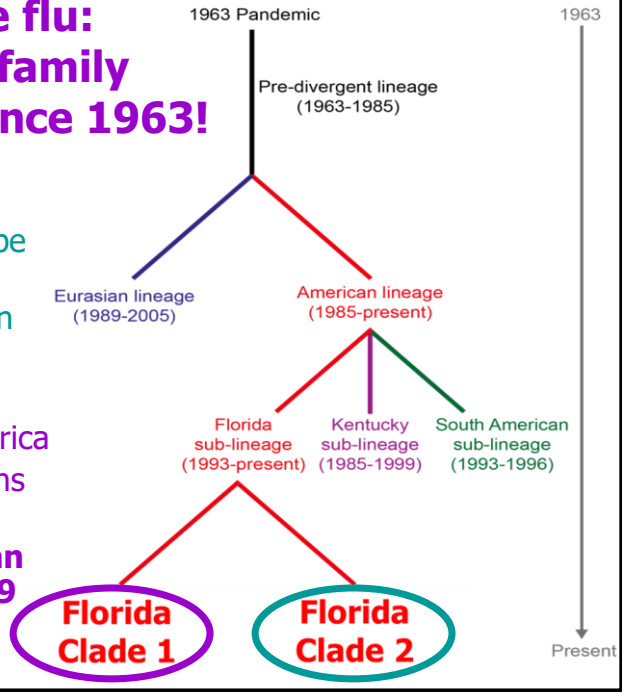


Florida Clade 2

- Continuous in Europe since 2003
- But not confirmed in UK since 2017

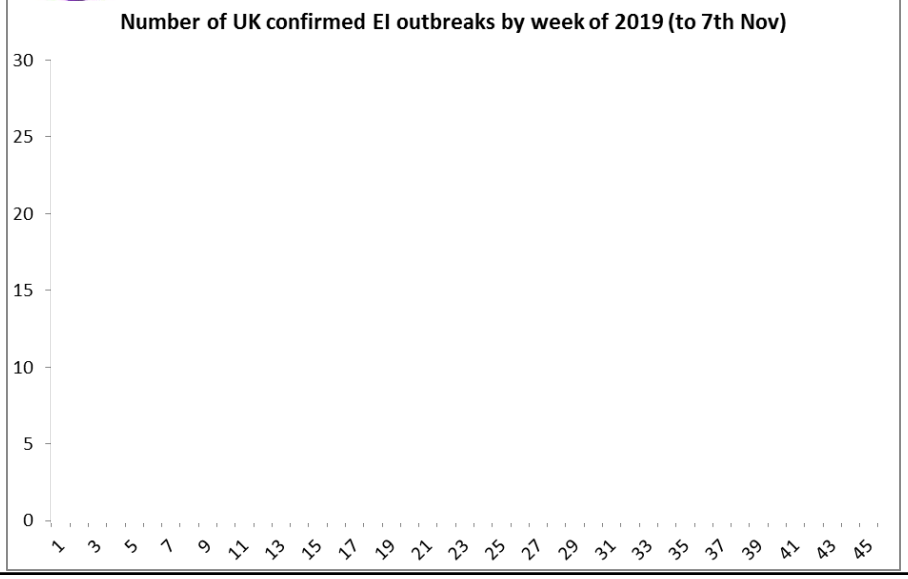
Florida Clade 1

- North & South America
- Occasional incursions into Europe
- **Cause of European outbreaks in 2019**



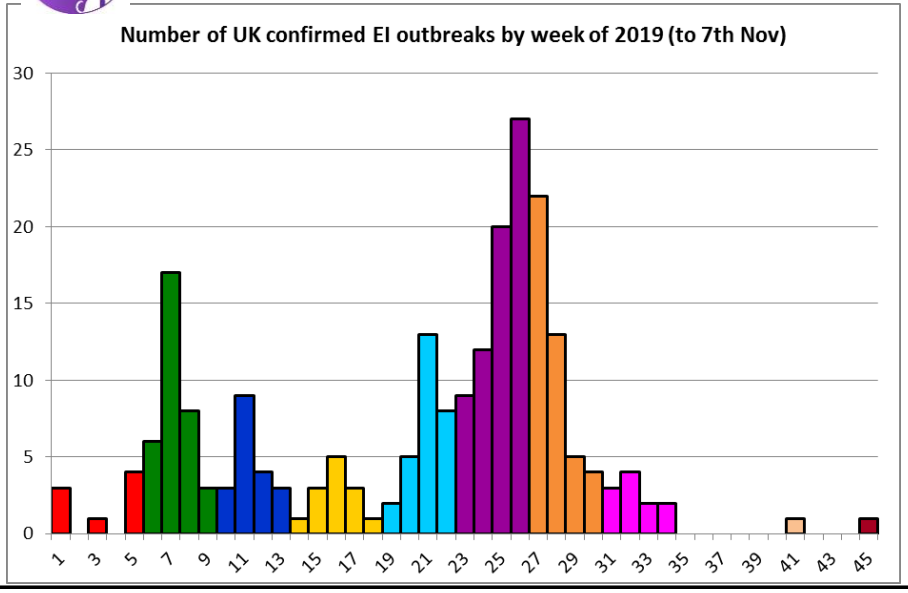
4

UK EI epidemic: 227 outbreaks

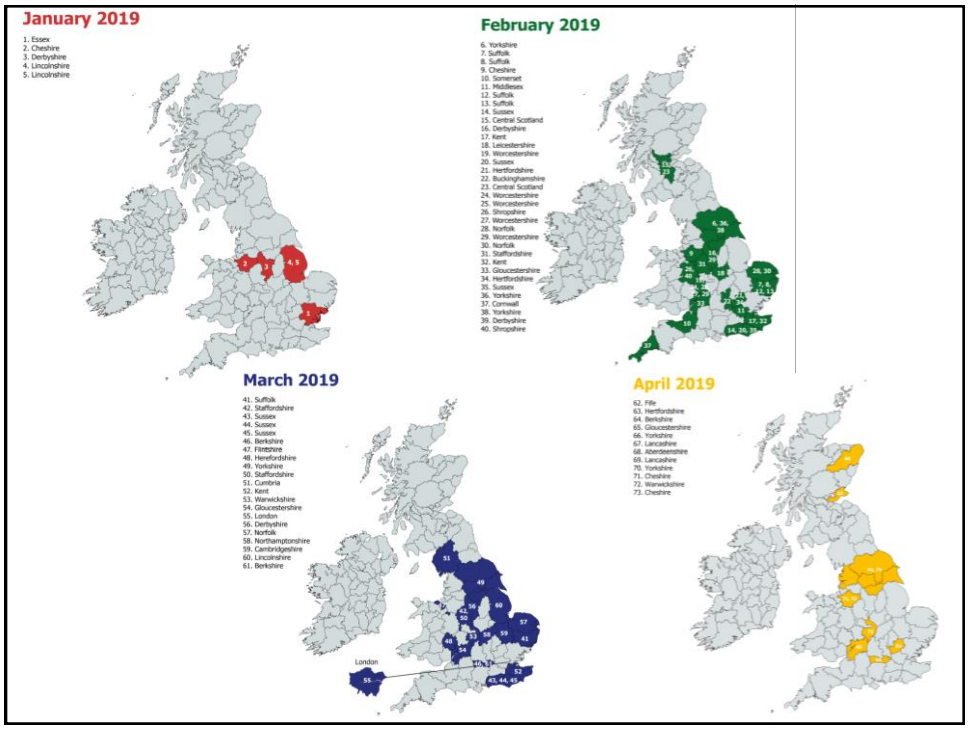


5

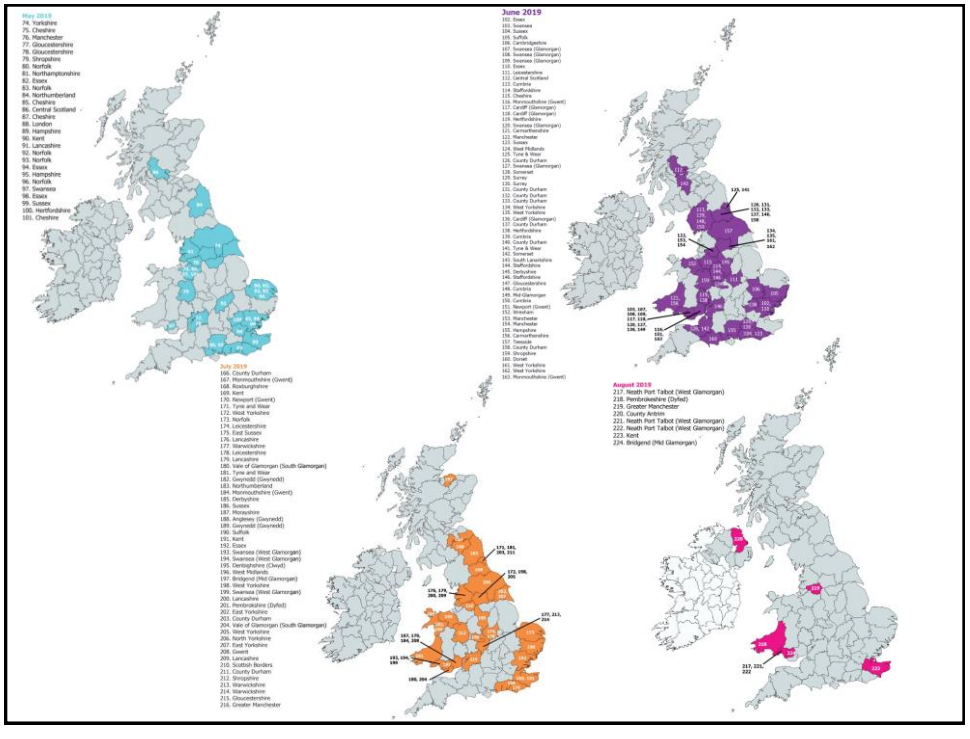
UK EI epidemic: 227 outbreaks



6


January 2019
1. Essex
2. Cheshire
3. Derbyshire
4. Lincolnshire
5. Lincolnshire
February 2019
6. Yorkshire
7. Suffolk
8. Suffolk
9. Cheshire
10. Somerset
11. Middlesex
12. Suffolk
13. Suffolk
14. Sussex
15. Central Scotland
16. Derbyshire
17. Kent
18. Leicestershire
19. Worcestershire
20. Sussex
21. Hertfordshire
22. Buckinghamshire
23. Central Scotland
24. Worcestershire
25. Worcestershire
26. Shropshire
27. Worcestershire
28. Norfolk
29. Worcestershire
30. Norfolk
31. Staffordshire
32. Kent
33. Gloucestershire
34. Hertfordshire
35. Sussex
36. Yorkshire
37. Cornwall
38. Yorkshire
39. Derbyshire
40. Shropshire
March 2019
41. Suffolk
42. Staffordshire
43. Sussex
44. Sussex
45. Sussex
46. Berkshire
47. Flintshire
48. Herefordshire
49. Yorkshire
50. Staffordshire
51. Cumbria
52. Kent
53. Warwickshire
54. Gloucestershire
55. London
56. Derbyshire
57. Norfolk
58. Northamptonshire
59. Cambridgeshire
60. Lincolnshire
61. Berkshire
London
April 2019
62. Fife
63. Hertfordshire
64. Berkshire
65. Gloucestershire
66. Yorkshire
67. Lancashire
68. Aberdeenshire
69. Lancashire
70. Yorkshire
71. Cheshire
72. Warwickshire
73. Cheshire

7


May 2019
74. Yorkshire
75. Cheshire
76. Manchester
77. Gloucestershire
78. Gloucestershire
79. Shropshire
80. Norfolk
81. Northamptonshire
82. Essex
83. Norfolk
84. Northumberland
85. Cheshire
86. Central Scotland
87. Cheshire
88. London
89. Hampshire
90. Kent
91. Lancashire
92. Norfolk
93. Norfolk
94. Essex
95. Hampshire
96. Norfolk
97. Swansea
98. Essex
99. Sussex
100. Hertfordshire
101. Cheshire
June 2019
102. Essex
103. Swansea
104. Sussex
105. Suffolk
106. Cambridgeshire
107. Swansea (Glamorgan)
108. Swansea (Glamorgan)
109. Swansea (Glamorgan)
110. Essex
111. Leicestershire
112. Central Scotland
113. Cumbria
114. Staffordshire
115. Kent
116. Monmouthshire (Gwent)
117. Cardiff (Glamorgan)
118. Cardiff (Glamorgan)
119. Hertfordshire
120. Cardiff (Glamorgan)
121. Carmarthenshire
122. Manchester
123. Sussex
124. West Midlands
125. Tyne & Wear
126. County Durham
127. Cardiff (Glamorgan)
128. Somerset
129. Surrey
130. Surrey
131. County Durham
132. County Durham
133. County Durham
134. West Yorkshire
135. West Yorkshire
136. Cardiff (Glamorgan)
137. County Durham
138. Hertfordshire
139. Kent
140. County Durham
141. Tyne & Wear
142. Somerset
143. South Lanarkshire
144. Staffordshire
145. Staffordshire
146. Staffordshire
147. Gloucestershire
148. Cumbria
149. Mid-Glamorgan
150. Cumbria
151. Monmouthshire (Gwent)
152. Wrexham
153. Manchester
154. Manchester
155. Hampshire
156. Carmarthenshire
157. Kent
158. County Durham
159. Shropshire
160. Dorset
161. West Yorkshire
162. West Yorkshire
163. Monmouthshire (Gwent)
July 2019
166. County Durham
167. Monmouthshire (Gwent)
168. Roxburghshire
169. Kent
170. Newport (Gwent)
171. Tyne and Wear
172. West Yorkshire
173. Norfolk
174. Leicestershire
175. Lancashire
176. Lancashire
177. Warwickshire
178. Leicestershire
179. Lancashire
180. Vale of Glamorgan (South Glamorgan)
181. Tyne and Wear
182. Gwynedd (Gwynedd)
183. Northumberland
184. Monmouthshire (Gwent)
185. Derbyshire
186. Sussex
187. Morayshire
188. Anglesey (Gwynedd)
189. Gwynedd (Gwynedd)
190. Suffolk
191. Kent
192. Essex
193. Swansea (West Glamorgan)
194. Swansea (West Glamorgan)
195. Denbighshire (Clwyd)
196. West Midlands
197. Bridgend (Mid Glamorgan)
198. West Yorkshire
199. Swansea (West Glamorgan)
200. Lancashire
201. Pembrokeshire (Dyfed)
202. East Yorkshire
203. County Durham
204. Vale of Glamorgan (South Glamorgan)
205. West Yorkshire
206. North Yorkshire
207. East Yorkshire
208. Gwent
209. Lancashire
210. Scottish Borders
211. County Durham
212. Shropshire
213. West Yorkshire
214. Warwickshire
215. Gloucestershire
216. Greater Manchester
August 2019
217. Neath Port Talbot (West Glamorgan)
218. Pembrokeshire (Dyfed)
219. Greater Manchester
220. County Antrim
221. Neath Port Talbot (West Glamorgan)
222. Neath Port Talbot (West Glamorgan)
223. Kent
224. Bridgend (Mid Glamorgan)

8

Summarising EI in UK in 2019

227 UK EI outbreaks in 2019 to 7th November

- Mainly England affected, involving many counties
  - South & then North Wales increasingly affected since May
- 25 (11%) involve vaccinated horses; all 3 vaccines involved
- Signs milder in vaccinated animals; some very sick/fatal cases reported among unvaccinated animals
- Few involving Thoroughbreds; 3 pre-training; 2 in-training
- Many linked to **new arrivals**, some from other EU countries; usually unvaccinated or history unknown
- Some linked to **mixing** e.g. through hunts in winter months, shows & events involved in summer months e.g. Appleby Fair
- Some large **unvaccinated** groups affected
- **Airborne spread** over distance suspected in some outbreaks

9

Some reflections on EI in 2019

- Failure to raise adequate awareness that EI was still present & a threat in UK in March/April?
  - Re. **risk of secondary wave** of disease
- Simple messages missed *or ignored* by horse owners & event organisers
  - Esp. wrt **vaccination & isolation**
- Factors that facilitated spread?
  - Low national vaccine coverage
  - Events still not requiring vaccination
  - Lack of preventive measures relating to new arrivals/event returnees
  - Questioning of adoption of new rules
  - Anti-vaxxer rhetoric via social media

10

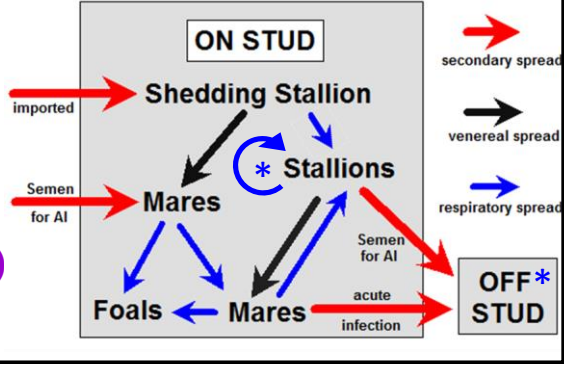
Overview of the update

- Equine Influenza (EI)
- Equine Viral Arteritis (EVA)
- Surveillance of Equine Strangles

11

What is Equine Viral Arteritis?

- Acute viral infection of horses, known as **EVA**
- Transmitted by **respiratory** & **venereal** routes
- Equine Arteritis Virus (EAV) **shed long-term in semen** in some recovered **'carrier' stallions**
- First recorded outbreak in UK in 1993 in imported 'carrier' stallion
- EVA in stallions made notifiable in **EVA Order (1995)**
- **Artervac vaccine**

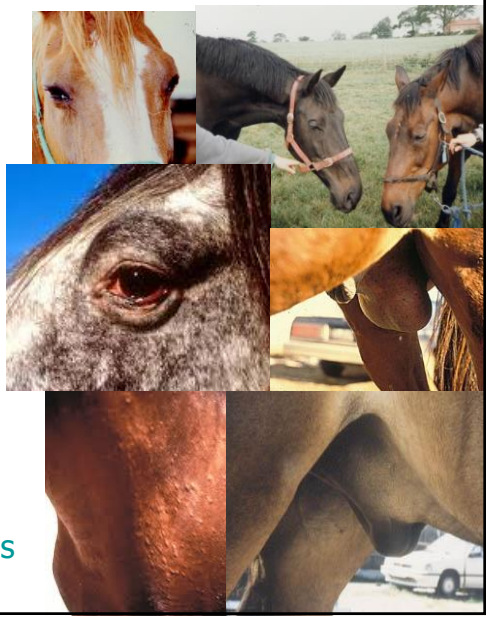


12

What does EAV do to horses?

Variable signs – from <u>none</u> to severe

- Fever & depression
- 'Pink eye' (conjunctivitis)
- Nasal discharge
- Swelling due to leaky blood vessels
  - Around the eyes, limbs, genitals, lower body
- Skin rashes
- **Abortion** in pregnant mares



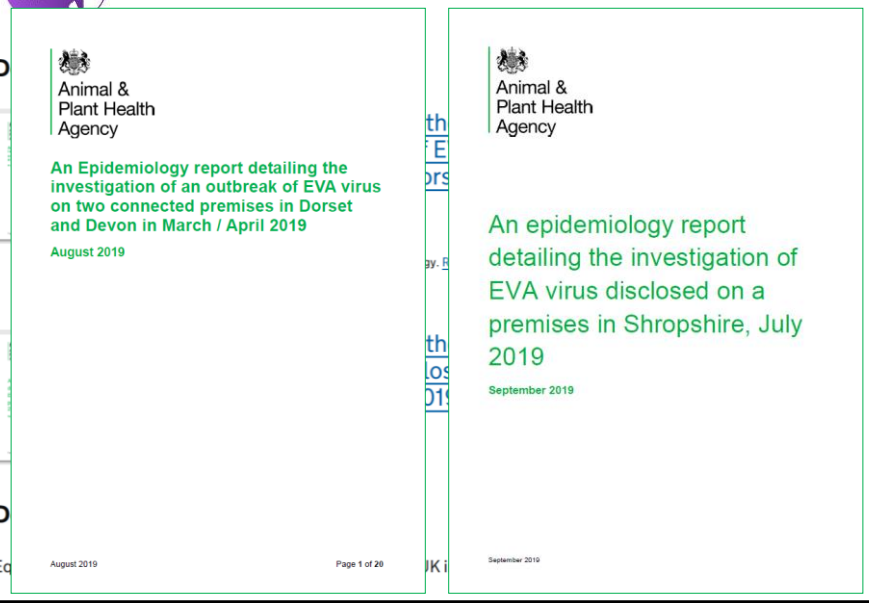
13

Summarising EVA in UK in 2019

- **EVA** confirmed **in 5 stallions on 3 premises** in UK in 2019
- All officially confirmed by UK's Chief Veterinary Officer under EVA Order & **reported to OIE**
  - **Three non-TB** stallions on a **Dorset** premise
    - Confirmed by CVO on **4th April**
  - **One non-TB** stallion on a **Devon** premise; epidemiologically linked to Dorset premise
    - Confirmed by CVO in **10th May**
  - **One non-TB** stallion on a **Shropshire** premise; no link to Dorset/Devon premises
    - Confirmed by CVO on **31st July**

14

APHA Epidemiology Reports



Animal & Plant Health Agency

An Epidemiology report detailing the investigation of an outbreak of EVA virus on two connected premises in Dorset and Devon in March / April 2019

August 2019

August 2019 Page 1 of 20

Animal & Plant Health Agency

An epidemiology report detailing the investigation of EVA virus disclosed on a premises in Shropshire, July 2019

September 2019

September 2019

15

Dorset premise

- Small commercial stud & dressage training facility
- Subclinical EVA confirmed in 3 stallions by PCR testing of semen by APHA
  - Investigated following **positive pre-breeding** ELISA serology & reporting under EVA Order (1995)
- Epi investigation concluded respiratory route most likely source & means of spread; **not venereal**
  - Positive stallions attended UK gatherings in 2018; also attended by stallion from Devon premise
  - Three high risk gatherings; provided opportunities for respiratory spread & were attended by horses from EU
  - Probable source window determined between 25th July & 7th October 2018 based on 3 high risk gatherings

16

Dorset premise

- Voluntary serological testing of non-stallions later conducted in accordance with HBLB CoP for EVA
  - Evidence of prior seroconversion to EAV with **16/24 (67%) seropositive**, including 4 colts (later gelded)
  - Stable titres on paired samples; date of exposure not determinable but evidence of likely respiratory spread
- One stallion has been officially returned to Spain
- Two stallions remain under breeding & movement restrictions under the EVA Order (1995)

17

Devon premise

- Recreational riding facility with lessons for visitors
- Subclinical EVA confirmed in one stallion by PCR testing of semen by APHA
  - History of close contact with Dorset stallions such that considered single epidemiological group in investigation
- Voluntary serological testing of non-stallions **NOT** conducted despite AHT offering reduced cost tests
  - Extent of respiratory spread on premise **not** determined
  - One mare had been bred to Dorset stallion in 2018 was **not** tested – help to inform likely source window??
  - **Not** complying with recommendations of HBLB CoP
  - Stallion & premises location publicly notified by Deputy CVO in letter to Veterinary Record of 24th August

18

Notice by the Secretary of State

Letters & Notices

NOTIFIABLE DISEASE

Equine viral arteritis in the UK

I WOULD like to draw the profession's attention to the following notice confirming the presence of equine viral arteritis (EVA) in a stallion:

'In accordance with Article 7(1) (a) of The Equine Viral Arteritis Order 1995 (SI 1995/1755), the secretary of state for the environment hereby gives notice that, following a veterinary inquiry into the suspicion of the existence of EVA in the stallion "Lago Icon", the chief veterinary officer of the Department for Environment, Food and Rural Affairs has confirmed, on the basis of the evidence available, that the virus of the disease has within 56 days prior to the completion of the inquiry existed in the stallion "Lago Icon" based at Stokelake, Chudleigh, Newton Abbot, Devon.'

Further information is available via www.gov.uk

I would also like to take this opportunity to remind practitioners, and horse and other equid keepers that EVA is a notifiable disease in the UK in all stallions and in mares that have been mated or inseminated in the past 14 days. This also applies to suspicion of disease following laboratory testing, meaning any private laboratory that detects a positive sample of serum or semen taken from a stallion, or a sample of serum taken from a mare which has been served, either naturally or by artificial insemination within the previous 14 days of the sample being taken, must inform the APHA. An attending veterinarian who reasonably suspects that the disease exists, or that the stallion may be a carrier of the virus must also inform the APHA.

If dealing with a suspicion or confirmed disease, please familiarise yourselves with the HBLB code of practice on EVA.'

This disease can be transmitted not only by sexual contact, but also through respiratory transmission (as

EVA is a notifiable disease in the UK in all stallions and in mares that have been mated or inseminated in the past 14 days

was likely to have been the case in the current outbreak) and through contaminated equipment, clothing, and so on, so good biosecurity and hygiene should be practised at all times.

This disease can be controlled through a combination of routine testing and vaccination and we recommend that all horses should be tested before breeding. Vaccination should only be used following testing with a negative result. Breeding stallions should be regularly vaccinated against EVA. We also strongly advise the testing of animals which are imported from other EU member states, particularly those where EVA is known to be circulating and if breeding activity is likely.

Graeme Cooke, Deputy Chief Veterinary Officer, Defra, Nobel House, 17 Smith Square, London SW1P 3JR

email: helpline@defra.gov.uk

Reference

1 HBLB. Equine Viral Arteritis – EVA. Code of Practice 2013. https://codes.hblb.org.uk/index.php/page/31 (accessed 15 August 2019)

doi: 10.1136/vr.k5211

396 3&10 August 2019 | VET RECORD

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19

Shropshire premise

- Small private non-Thoroughbred facility
- Subclinical EVA confirmed in one stallion by PCR testing of semen by APHA
  - Investigated following positive pre-breeding ELISA serology & positive PCR by private laboratory & reporting under EVA Order (1995)
- Voluntary serological testing of 4 non-stallions conducted in accordance with HBLB CoP for EVA
  - An aged gelding was seropositive with stable titres
  - Mare and colt foal bred by stallion in March 2018 were both seronegative
- Positive stallion was gelded on 7th August 2019

20

Concluding remarks on EVA 2019

- Following **HBLB Codes** facilitated EVA detection
- Probable respiratory transmission route in Dorset & Devon outbreak presented **new challenges** for control of EVA in the UK under the 1995 Order
  - HBLB Codes of Practice **if followed** facilitate appropriate control measures
  - Shropshire outbreak less complex but did follow CoP
- Defra consulted closely with industry stakeholders
  - Regular stakeholder teleconference meetings
  - Occasional expert group consultations
- Defra outbreak management review still ongoing
  - Industry have supplied detailed feedback to Defra

21

Overview of the update

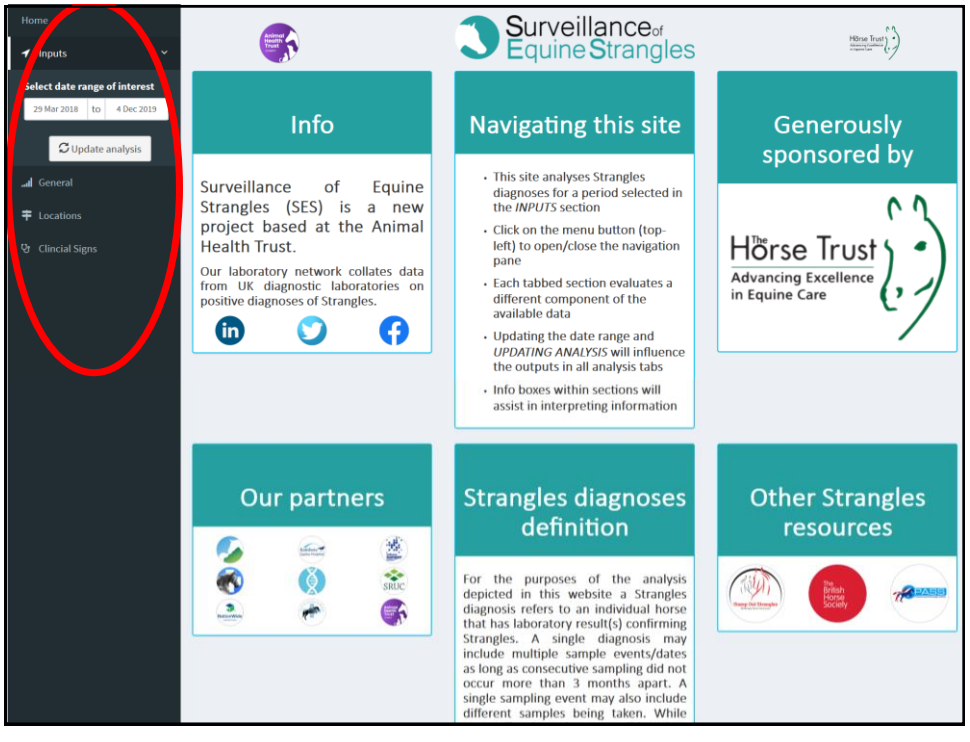
- Equine Influenza (EI)
- Equine Viral Arteritis (EVA)
- Surveillance of Equine Strangles

22

Surveillance of Equine Strangles

- **Horse Trust** funded development project that started in April 2018
- Aims to collate data on strangles diagnoses (*S. equi* detection) by UK labs
  - **Where?** Mapping of diagnosing vet practices
  - **Who?** Signalment of affected horses
  - **Why?** Clinical signs & reasons for sampling
  - **How?** Sample & diagnoses types
- **Publicly report the collated data**
  - Soon to be launched online platform…….
  - https://app.jshiny.com/jdata/ses/sesview

23



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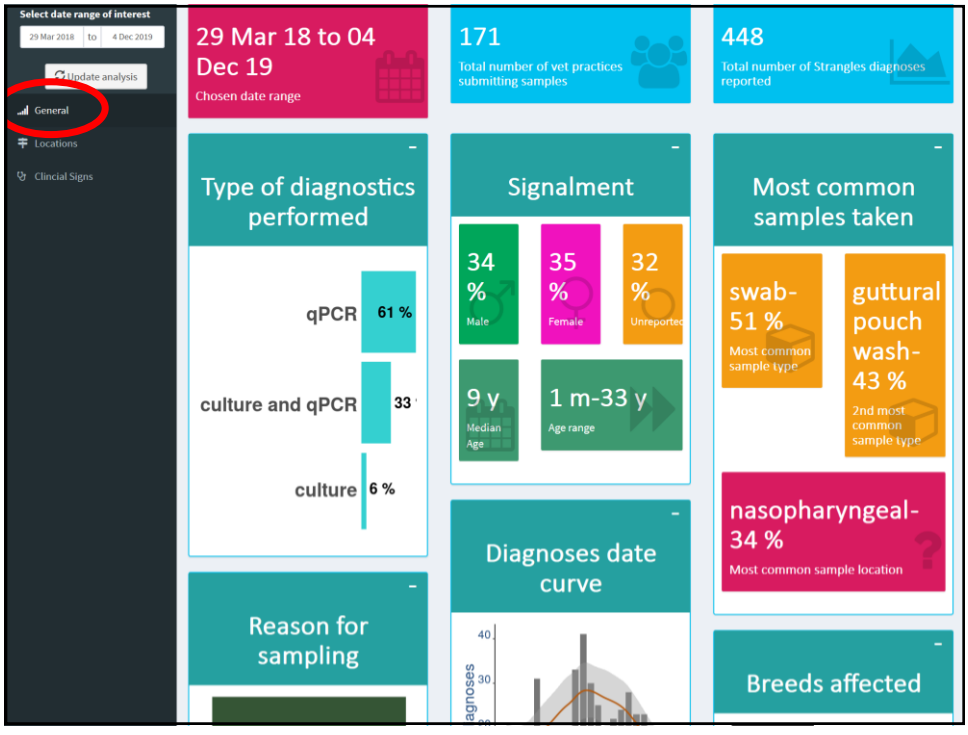
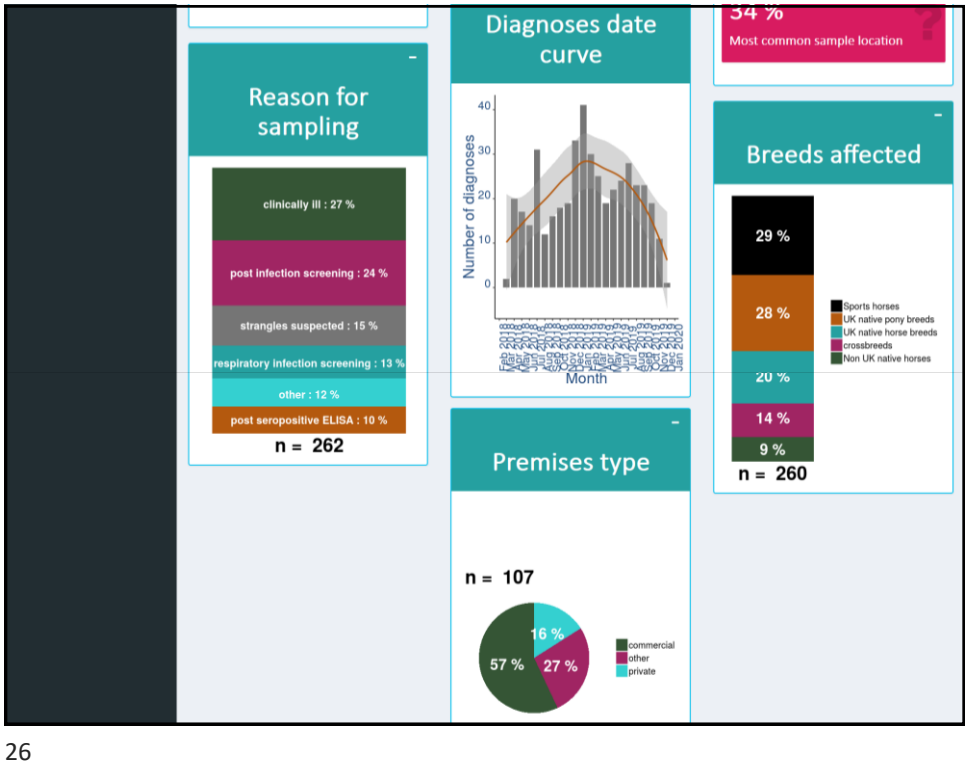
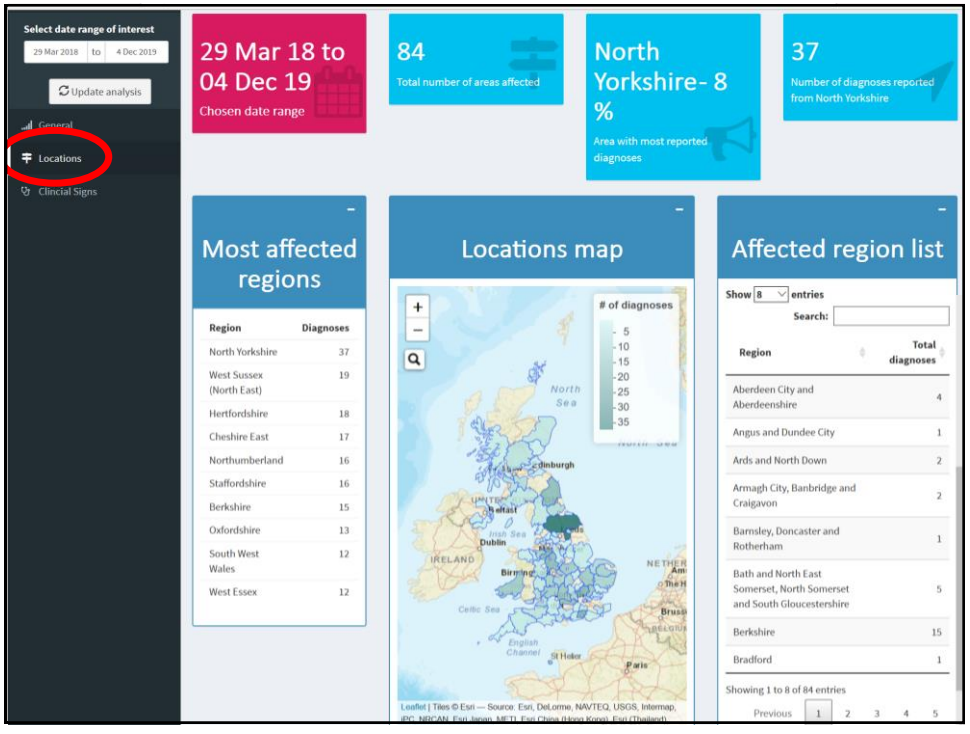

Select date range of interest
29 Mar 2018
to
4 Dec 2019
Update analysis
General
Locations
Clincial Signs
29 Mar 18 to 04 Dec 19
Chosen date range
171
Total number of vet practices submitting samples
448
Total number of Strangles diagnoses reported
Type of diagnostics performed
qPCR
61 %
culture and qPCR
33
culture
6 %
Signalment
34 %
Male
35 %
Female
32 %
Unreported
9 y
Median Age
1 m-33 y
Age range
Most common samples taken
swab- 51 %
Most common sample type
guttural pouch wash- 43 %
2nd most common sample type
nasopharyngeal- 34 %
Most common sample location
Reason for sampling
Diagnoses date curve
Breeds affected

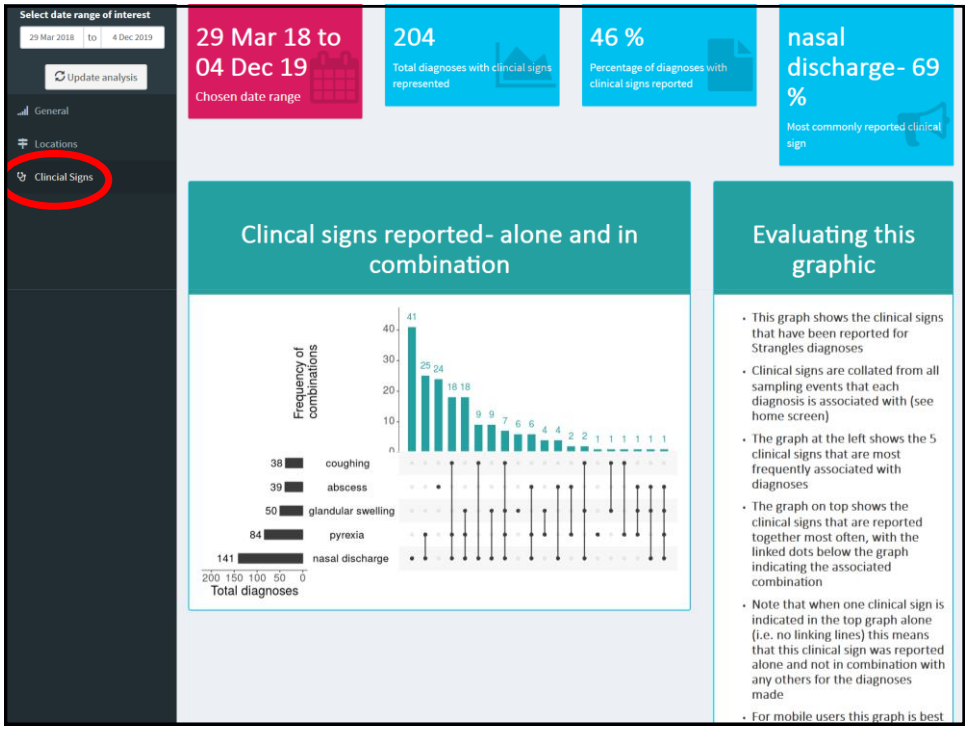
25


Reason for sampling
clinically ill : 27 %
post infection screening : 24 %
strangles suspected : 15 %
respiratory infection screening : 13 %
other : 12 %
post seropositive ELISA : 10 %
n = 262
Diagnoses date curve
Number of diagnoses
Month
Premises type
n = 107
16 %
57 %
27 %
commercial
other
private
34 %
Most common sample location
Breeds affected
29 %
28 %
20 %
14 %
9 %
n = 260
Sports horses
UK native pony breeds
UK native horse breeds
crossbreeds
Non UK native horses

26


Select date range of interest
29 Mar 2018 to 4 Dec 2019
Update analysis
General
Locations
Clincial Signs
29 Mar 18 to 04 Dec 19
Chosen date range
84
Total number of areas affected
North Yorkshire- 8 %
Area with most reported diagnoses
37
Number of diagnoses reported from North Yorkshire
Most affected regions
Region Diagnoses
North Yorkshire 37
West Sussex (North East) 19
Hertfordshire 18
Cheshire East 17
Northumberland 16
Staffordshire 16
Berkshire 15
Oxfordshire 13
South West Wales 12
West Essex 12
Locations map
# of diagnoses
5
10
15
20
25
30
35
Affected region list
Show 8 entries
Search:
Region Total diagnoses
Aberdeen City and Aberdeenshire 4
Angus and Dundee City 1
Ards and North Down 2
Armagh City, Banbridge and Craigavon 2
Barnsley, Doncaster and Rotherham 1
Bath and North East Somerset, North Somerset and South Gloucestershire 5
Berkshire 15
Bradford 1
Showing 1 to 8 of 84 entries
Previous 1 2 3 4 5

27


Select date range of interest
29 Mar 2018 to 4 Dec 2019
Update analysis
General
Locations
Clincial Signs
29 Mar 18 to 04 Dec 19
Chosen date range
204
Total diagnoses with clincial signs represented
46 %
Percentage of diagnoses with clinical signs reported
nasal discharge- 69 %
Most commonly reported clinical sign
Clincal signs reported- alone and in combination
Frequency of combinations
41
25 24
18 18
9 9 7 6 6 4 4 2 2 1 1 1 1 1
38 coughing
39 abscess
50 glandular swelling
84 pyrexia
141 nasal discharge
200 150 100 50 0
Total diagnoses
Evaluating this graphic
This graph shows the clinical signs that have been reported for Strangles diagnoses
Clinical signs are collated from all sampling events that each diagnosis is associated with (see home screen)
The graph at the left shows the 5 clinical signs that are most frequently associated with diagnoses
The graph on top shows the clinical signs that are reported together most often, with the linked dots below the graph indicating the associated combination
Note that when one clinical sign is indicated in the top graph alone (i.e. no linking lines) this means that this clinical sign was reported alone and not in combination with any others for the diagnoses made
For mobile users this graph is best

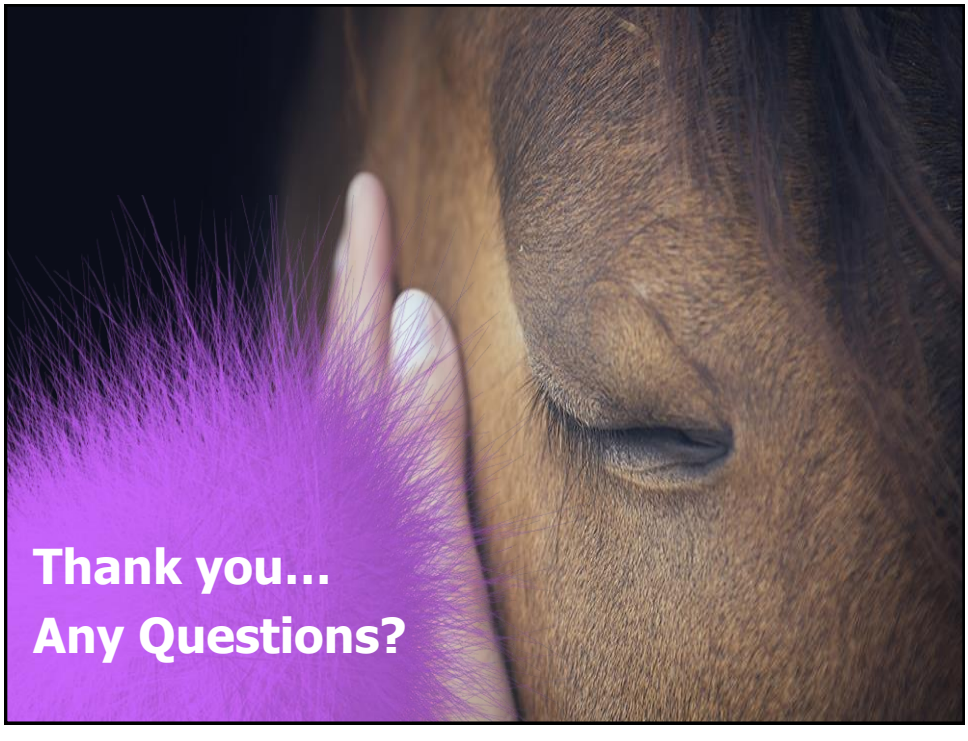
28

SES going forward 2020-23

Horse Trust now funding extension of SES as a 4-year PhD project

- Extend SES internationally
  - UK data compared with other countries?
- Compare *S. equi* genome 'fingerprints'
  - Links between outbreaks? Transmission routes?
- Assessment of transmission networks
  - Contact networks contributing to strangles?
- Assessment of biosecurity impacts
  - Biosecurity reducing *S. equi* transmission?

29



30