Equine Influenza: A Resurgent Threat to Global Equid Populations in 2018 / 2019

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Image ack: L.M. Stannard
## Epidemics of Equine Influenza Resulting from International Movement of Equids, 1963 – 2019

<table>
<thead>
<tr>
<th>Virus Strain</th>
<th>Importing Country</th>
<th>Year</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equine-2</td>
<td>USA</td>
<td>1963</td>
<td>South America</td>
</tr>
<tr>
<td>(new subtype)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equine-2</td>
<td>Western Europe</td>
<td>1965</td>
<td>North America</td>
</tr>
<tr>
<td>Equine-1</td>
<td>England, Ireland</td>
<td>1977</td>
<td>Continental Europe</td>
</tr>
<tr>
<td>Equine-1</td>
<td>Singapore-Malaysia</td>
<td>1977</td>
<td>United Kingdom</td>
</tr>
<tr>
<td>Equine-2</td>
<td>England, Ireland</td>
<td>1979</td>
<td>Continental Europe</td>
</tr>
<tr>
<td>Equine-2</td>
<td>South Africa</td>
<td>1986</td>
<td>USA</td>
</tr>
<tr>
<td>Equine-2</td>
<td>India</td>
<td>1987</td>
<td>France</td>
</tr>
<tr>
<td>Equine-2</td>
<td>Jamaica</td>
<td>1989</td>
<td>USA</td>
</tr>
<tr>
<td>Equine-2</td>
<td>Hong Kong</td>
<td>1992</td>
<td>UK &amp; Ireland</td>
</tr>
<tr>
<td>Equine-2</td>
<td>UAE (Dubai)</td>
<td>1995/6</td>
<td>USA</td>
</tr>
<tr>
<td>Equine-2</td>
<td>Puerto Rico</td>
<td>1997</td>
<td>USA</td>
</tr>
<tr>
<td>Virus Strain</td>
<td>Importing Country</td>
<td>Year</td>
<td>Source</td>
</tr>
<tr>
<td>--------------</td>
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<td>------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>Equine-2</td>
<td>Philippines</td>
<td>1997</td>
<td>USA</td>
</tr>
<tr>
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<td>South Africa</td>
<td>2003</td>
<td>USA</td>
</tr>
<tr>
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<td>Japan</td>
<td>2007</td>
<td>Europe or USA</td>
</tr>
<tr>
<td>Equine-2</td>
<td>Australia</td>
<td>2007</td>
<td>Japan</td>
</tr>
<tr>
<td>Equine-2</td>
<td>England</td>
<td>2009</td>
<td>The Netherlands</td>
</tr>
<tr>
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<td>England</td>
<td>2010</td>
<td>France</td>
</tr>
<tr>
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<td>France</td>
<td>2012</td>
<td>Spain</td>
</tr>
<tr>
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<td>France</td>
<td>2014</td>
<td>Ireland</td>
</tr>
<tr>
<td>Equine-2</td>
<td>France</td>
<td>2014</td>
<td>The Netherlands</td>
</tr>
<tr>
<td>Equine-2</td>
<td>Malaysia</td>
<td>2015</td>
<td>Imported horse(s); origin not confirmed</td>
</tr>
</tbody>
</table>
Special focus on infectious disease and global risks

Equine disease events resulting from international horse movements: Systematic review and lessons learned

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Equine Disease Events Resulting from International Horse Movements: Systematic Review and Lessons Learned (Dominguez et al., EVJ, 2015)

- Review based on equine disease events that occurred January 1995 – December 2014 and
  - a) reported to the OIE
  - or b) published in scientific literature
  - or c) confirmed by nat’l / internat’l reference lab
  - or d) demonstrated conclusively by epidemiological investigation as resulting from international movement

(continued)
Equine Disease Events Resulting from International Horse Movements: Systematic Review and Lessons Learned (Domínguez et al., EVJ, 2015)

(continued)

- **Temporary importations:**
  Zero detection of disease introductions.

- **Permanent importations:**
  Equine influenza most frequently identified disease event (13).
Global Distribution of Equine Influenza Virus

- Found in equine populations in many countries.
- Australia, Iceland and New Zealand confirmed virus free.
- Endemic in many European countries and North America.
- Status of certain countries uncertain due to an absence of active surveillance for the disease.
Two Subtypes of Equine Influenza Virus:

- Influenza A/ equine Prague / ’56 (H7N7)
- Influenza A/ equine Miami/ ’63 (H3N8)
Schematic Representation of Divergence within H3N8 EIV

- Influenza A / equine Miami / ’63 (H3N8)
- Eurasian lineage
- American lineage
- Florida sublineage
- Kentucky sublineage
- Argentina sublineage
- Clade 1
- Clade 2
Characterisation of H3N8 viruses from EI outbreaks in North and South America, Europe and China revealed changes in the lineage and sublineages of circulating viruses.

No evidence of H7N7 virus or H3N8 strains of Eurasian lineage in circulation.
Changing Profile of Circulating H3N8 Virus Strains over Time (cont.)

- Up to 2018, clade 2 strains were in circulation in Ireland and the UK, and clade 1 strains in the USA.

- Dramatic changes in 2018 / 2019: All isolates of H3N8 virus from outbreaks in South America, China, Europe and the USA characterised as clade 1 strains.

- Strains very similar to majority of clade 1 viruses identified in the USA in 2017.
Differed significantly from previous years:

- global distribution of disease,
- EI outbreaks reported in Africa, Asia, Europe, North and South America,
- significant increase in incidence of EI in various European countries.
South American Countries Affected with Equine Influenza

- Equine influenza diagnosed in Chile, Argentina, Colombia, Ecuador and Uruguay in 2018.
- Disease in Argentina noted more severe than in previous event in 2012.
African Countries that Experienced EI in 2018 / 2019
Niger and Nigeria first to report disease in late 2018.

In early 2019, EI spread to Ghana, Burkina Faso, Mali, Senegal, South Darfur in West Sudan and Chad.

Spread was uncontrolled, donkeys and horses affected.

Fatality rate in donkey populations enormous, estimated in 100,000’s in some countries; few fatalities in horses.
The Donkey Sanctuary
Lamu - carrying cement. Donkeys on the island of Lamu are kept busiest on the docks and on building work. Sadly it was not unusual to see a donkey with three 50 kg bags of cement on their backs or panniers piled high with damp sand or building blocks.
https://www.flickr.com/photos/thedonkeysanctuary/3585159752

Lamu Island is a part of the Lamu Archipelago of Kenya.
Donkeys and mules continue to be used to haul materials around the Medina of Marrakech, Morocco.
https://www.flickr.com/photos/rogersg/31167780403
Equine Influenza Presentation in Donkeys

- Typical cases exhibited sweating, nasal discharges, panting, respiratory distress and death in 2-3 days.

- Principal changes reported on postmortem examination were consolidated, marbled lungs accompanied by pericarditis in a small percentage of cases.
Fulminant Cases of Pneumonia in Donkeys
Chad, 2019

Ack: S. Munstermann
Pneumonic Lesions in Donkeys
Chad, 2019

Ack: S. Munstermann
Extent of Occurrence of EI in Europe between January 1 and October 11, 2019

https://app.jshiny.com/jdata/equiflunet/equiflunet/
Widespread incidence of the disease across Europe.

Following initial reports from France, multiple outbreaks confirmed in Belgium, Denmark, Germany, Ireland, Italy, the Netherlands, Sweden and the UK in 2019.

Outbreak numbers significantly greater in certain countries than in previous years.

The UK very badly affected, with over 200 outbreaks recorded in first 6 months of 2019.
Profile of EI Activity by European Country between January 1 and October 11, 2019

Global outbreak curve

Number of outbreaks

Month

Jan 2019
Feb 2019
Mar 2019
Apr 2019
May 2019
Jun 2019
Jul 2019
Aug 2019
Sep 2019
Oct 2019

Belgium
Denmark
France
Germany
Ireland
Netherlands
Nigeria
Senegal
Sudan
Sweden
United Kingdom
United States of America

https://app.jshiny.com/jdata/equiflunet/equiflunet/
Extent of EI Activity by UK County between January 2 and October 9, 2019

https://app.jshiny.com/jdata/equiflunet/equiflunet/
Number of Outbreaks of EI in the UK between January 2 and October 9, 2019

https://app.jshiny.com/jdata/equiflunet/equiflunet/
Virus activity reported by a variable number of states in 2018 and 2019.

Unlike the situation in Europe, outbreak numbers have not increased significantly over those reported in previous years.

Similar to Europe and South America, disease of moderate severity was recorded in some outbreaks involving fully vaccinated horses.
Several outbreaks of EI were reported by China; the disease was considered more prevalent in donkey populations.
Factors that Contributed to the Spread of Equine Influenza

- Failure to isolate horses upon initial introduction onto a premises.
- Recent movements, often not accompanied by any certificate / declaration of health.
- Mixing of non-vaccinated with vaccinated horses.
- Scant attention paid to good management / biosecurity practices.
Lack of vaccination with a product containing a clade 1 strain of virus majorly responsible for widespread dissemination and increased frequency and severity of disease.

Failure to observe basic principles of good management and biosecurity by some in horse industry contributed to virus spread and greatly hindered control efforts.
Recommendations Going Forward

► Actively promote vaccination against EI across a wider swath of the industry.
Equine influenza vaccines should contain appropriate representatives of both clade 1 and clade 2 viruses of the Florida sublineage (OIE Recommendation, April 2019)

► Clade 1: A/eq/South Africa/04/2003-like, or A/eq/Ohio/2003-like viruses

► Clade 2: A/eq/Richmond/1/2007-like virus
Recommendations Going Forward

► Actively promote vaccination against EI across a wider swath of the industry.

► Emphasise the importance of good management and biosecurity practices in disease control.
The Animal Health Trust recommends five basic protocols:

**VACCINATE**
**BOOST YOUR HORSE’S VACCINATION IF IT WAS GIVEN MORE THAN 6 MONTHS AGO AND ENCOURAGE OTHERS TO DO THE SAME**
If your horse is not vaccinated, it will need to start a course of vaccinations and will not have protection until two weeks after the second vaccine in the course is given.

**ISOLATE**
**WHAT BIOSECURITY MEASURES ARE IN PLACE AT YOUR OWN YARD?**
Immediately isolate new or unwell horses away from the main yard. Flu is easily spread amongst a group of horses.

**COMMUNICATE**
**BE OPEN #1 IF YOU SUSPECT EQUINE FLU CALL YOUR VET IMMEDIATELY TO INVESTIGATE**
If you have a suspected or confirmed outbreak, tell others and help minimise the spread of flu.

**INVESTIGATE #2 IF YOU’RE PLANNING TO ATTEND AN EVENT OR EQUINE GATHERING**
Contact the organisers & ask about their biosecurity policies

**MITIGATE**
**DO ALL YOU CAN TO KNOW THE RISK OF MOVING YOUR HORSE OR ATTENDING AN EVENT!**
Mitigate against the risk and make your own sensible decision based on this.

The latest information from the Animal Health Trust on equine flu outbreaks is available from www.equiflunet.org.uk or by following @equiflunet on Twitter.
Animal Health Trust helpful guide to attending equine events

The following advice is designed to provide some help to horse owners and competitors to reduce the risk, both to your horse and other horses, acquiring and spreading equine flu through attending any equine event.

1. Ensure your horse has been vaccinated within 6 months and allow 1 week between vaccination and going to the show.

2. If you have any concerns about your horse’s health (fever, cough, lethargy etc.) do not go to the competition.

3. Do not let your horse graze at the competition, an infectious horse may have grazed in that field too!

4. Do not share water or feed buckets or use communal water troughs.

5. Do not share tack, such as bits and bridles.

6. Don’t let your horse make contact with other horses.

7. Ensure if you’re stabling away, that the stable has been cleaned and disinfected - including feed mangers and water drinkers before you use it.

8. Isolate your horse when returning to your home premises. Carefully monitor incl. taking its rectal temperature twice daily. Any concerns call your vet.

Finally, if you are concerned about your horse’s health, please consult your vet for advice.

To find out more about the work of the Animal Health Trust, go to www.aht.org.uk. Charity number 200642.
Recommendations Going Forward

► Actively promote vaccination against EI across a wider swath of the industry.

► Emphasise the importance of good management and biosecurity practices in disease control.

► The basis for vaccination “break-downs” warrants further investigation.

► Strains of H3N8 virus in current circulation need to be monitored for evidence of genetic divergence from the OIE recommended clade 1 and 2 vaccine strains.