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**National Hunt racehorse  
inflammatory airway disease:  
associations with bacteria, viruses,  
age, time in training and  
transferrin types**

JR Newton, JLN Wood, KC Smith and JC Cardwell

# Background and relevance to the Thoroughbred 1

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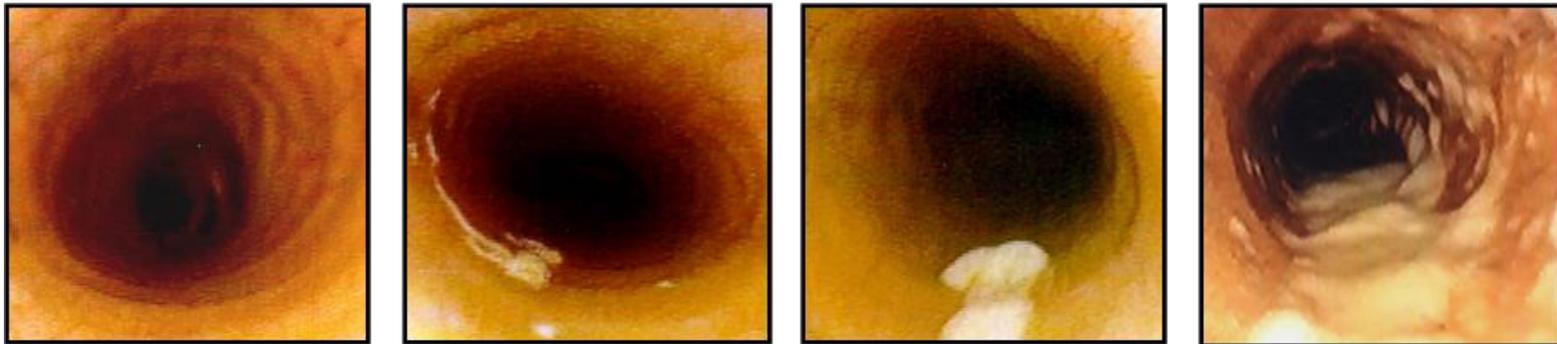
- Respiratory disease is important in groups of racehorses as it affects their ability to train and race but it is not always clinically obvious.
  - It may or may not be accompanied by other signs e.g. 'inflammatory airway disease' (IAD)
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# Background and relevance to the Thoroughbred

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- IAD diagnosed by endoscopy and tracheal aspirate cytology



# Aims and objectives 1

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- Describe the epidemiology of IAD in National Hunt (NH) horses
  - Investigate differences in risk of IAD between ex-stores (not raced) and ex-flat (raced) horses
    - Evaluate time in training vs age *per se* as risk factors
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# Aims and objectives 2

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- Investigate association of IAD with risk factors
    - Bacterial and viral infections
    - Horse's genotype
    - Clinical respiratory signs, EIPH and previous IAD
    - Intensity of exercise
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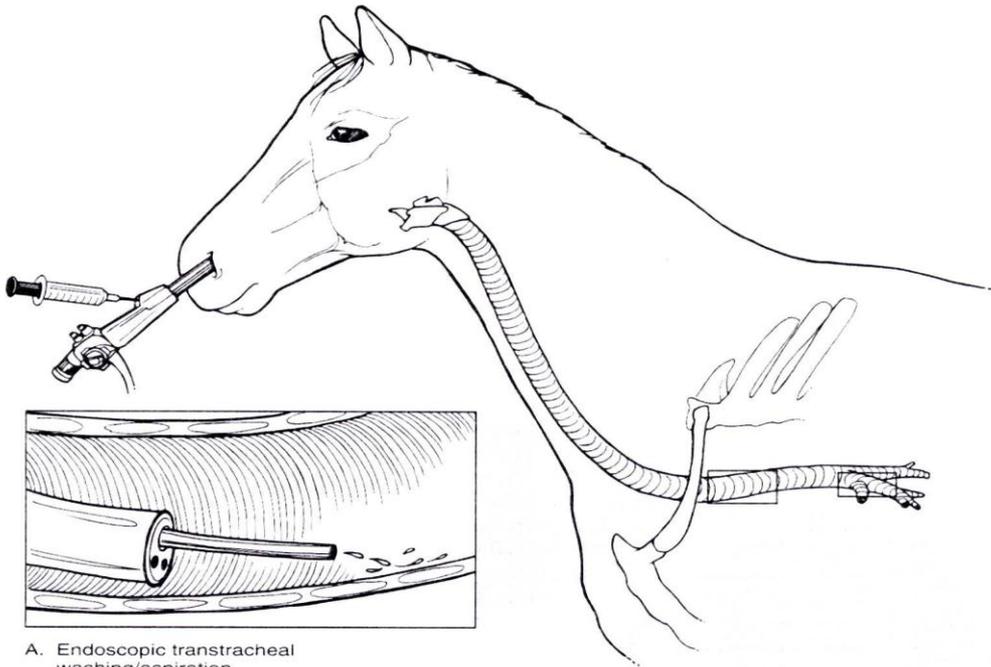
# Materials & methods 1

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- 10-15 NH racehorses on 5 training yards sampled monthly over 2 seasons
  - Tracheal endoscopy to evaluate mucus + cytology, bacteriology, serology
  - 9-point inflammation score (IS) applied with IAD defined as  $IS \geq 6/9$
  - Factors associated with IAD evaluated statistically in multivariable models
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# Materials & methods 2

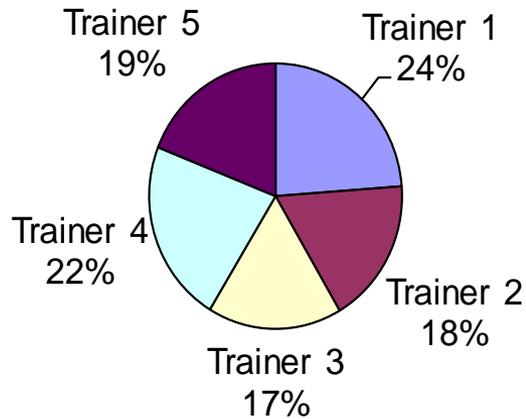
- Endoscopy of trachea after exercise
  - Mucus and blood visually assessed
  - Tracheal washes collected via endoscope



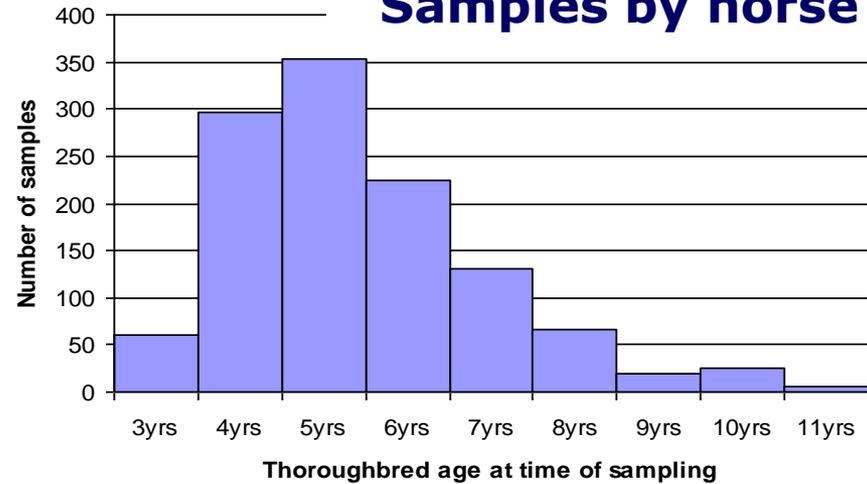


# Results 1

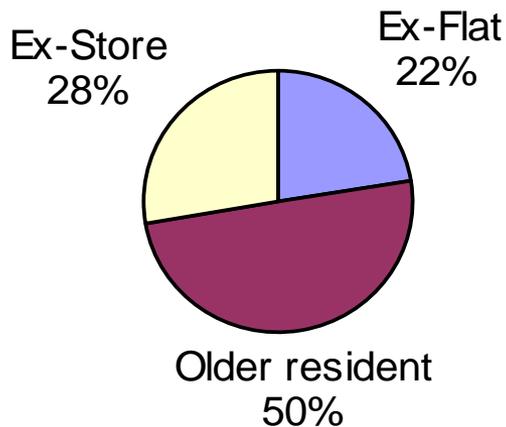
## Samples by trainer



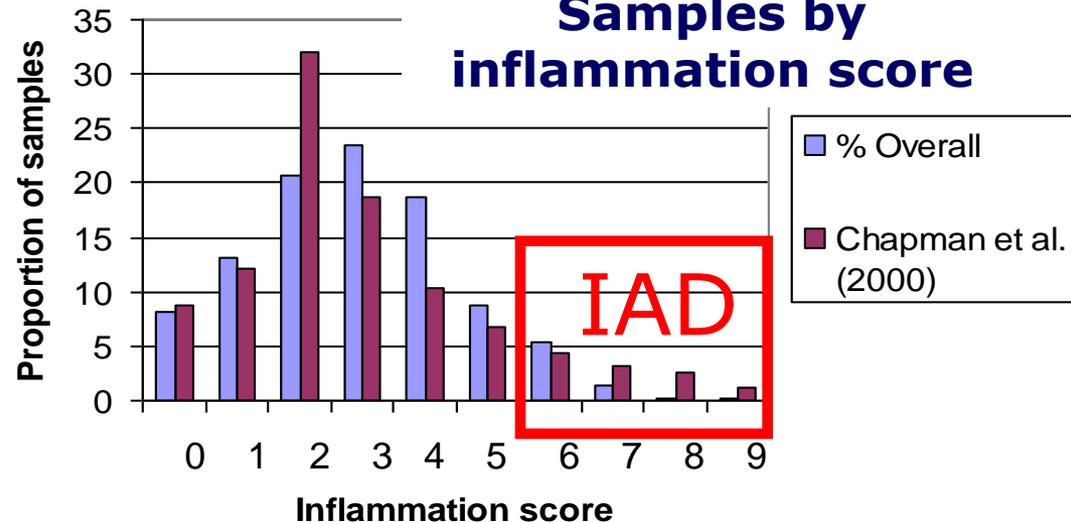
## Samples by horse age



## Samples by horse status



## Samples by inflammation score





## Results 2

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- 1184 tracheal washes from 177 horses
  - IAD less frequent in NH cf flat trained TBs
    - 7.1% vs 13.8% (Wood *et al* 2005)
  - Increased risk of IAD with <3 months in training (but not age); *S. zooepidemicus* and EHV-1 infections; IAD in the previous month; EIPH and genotype
    - All consistent with IAD in flat trained TBs
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# Conclusions and impact on the Thoroughbred

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- Early training rather than young age *per se* is consistent with acquisition of immunity
    - But residual effect not explained by other significant factors e.g. *S. zoo* infections
    - Are unmeasured environmental or infectious factors encountered in early training?
  - EIPH and IAD could be cause **and** effect
    - Highlights importance of EIPH in racehorse respiratory health & deserves further study
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# Scientist's summary

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- Respiratory disease is the second most common reason for racehorses failing to train and race and is often found in investigations of poor performance in training yards.
  - Inflammatory airway disease (IAD) is the most important form of respiratory disease in young racehorses (animals less than 4 years old) in the UK, although little was known about the frequency of and risk factors for IAD in older National Hunt (NH) racehorses before this study was conducted.
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# Scientist's summary

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- This study demonstrated that risk of IAD is significantly higher in the first few months of training. Horses of a given age entering NH yards that are kept at pasture as 'stores' and not previously trained have a significantly *increased* risk of disease than those of the same age that join NH racing from flat-training yards.
  - This finding suggests that the age related reductions in frequency of respiratory disease seen in younger flat-trained racehorses are attributable to time in training rather than age *per se*.
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# Scientist's summary

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- Some of this increased risk can be attributed to bacterial infections, as horses with no previous training have had less contact with other horses and therefore have not developed immunity against infections arising from such contact.
  - *Streptococcus zooepidemicus* is the bacterial species most strongly associated with IAD in NH horses, as it is in younger racehorses.
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# Scientist's summary

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- Even accounting for these infections, there is still an increased risk associated with the early period after entering training.
  - It is likely that there is some risk of respiratory disease associated with exposure to the stable and training environment.
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# Scientist's summary

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- There is also evidence for an association between airway inflammation and bleeding into the lungs (commonly referred to as exercise induced pulmonary haemorrhage or EIPH), which is thought to result from cumulative damage to the respiratory system during training and racing.
  - Finally there is some further evidence provided by this study for a genetic susceptibility to respiratory disease linked with different protein types.
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# Scientist's summary

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- In conclusion, whilst this study confirmed the importance of some bacterial infections in NH racehorses entering training for the first time, it also indicated that airway inflammation may be an inevitable consequence of stabling and training.
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# Find out more about respiratory disease in racehorses

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- K Smith, Lower airway disease: now and in the future.

<http://onlinelibrary.wiley.com/doi/10.1111/j.2042-3306.2011.00375.x/full>

- Elton, D, Bryant, N, Facing the treat of Equine influenza.

<http://onlinelibrary.wiley.com/doi/10.1111/j.2042-3306.2010.00357.x/full>

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