

Genetic analysis of patellar luxation in dogs

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Patellar luxation

Not only dogs - frequently found in cattle, sheep, horses..

One of the most common orthopedic diseases in dogs

Pain and lameness

Small dogs are more likely to develop patellar luxation -
need for treatment increase with severity and size of the dog

Diagnosis

Palpation of the joint

The dog at least 1 year of age

Grading on scale 0-3:



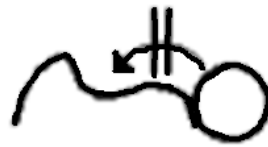
0 (normal)



1



2



3

Health program

Recorded by the Swedish Kennel Club as part of central screening program for diseases

Some breeds with mandatory requirement to screen all breeding animals

No restriction based on screening result – only known status required

Aim of study

Evaluate the effect of the current genetic health program for patellar luxation

To estimate genetic parameters and trends

Two breeds: Bichon Frise and Chihuahua

Data

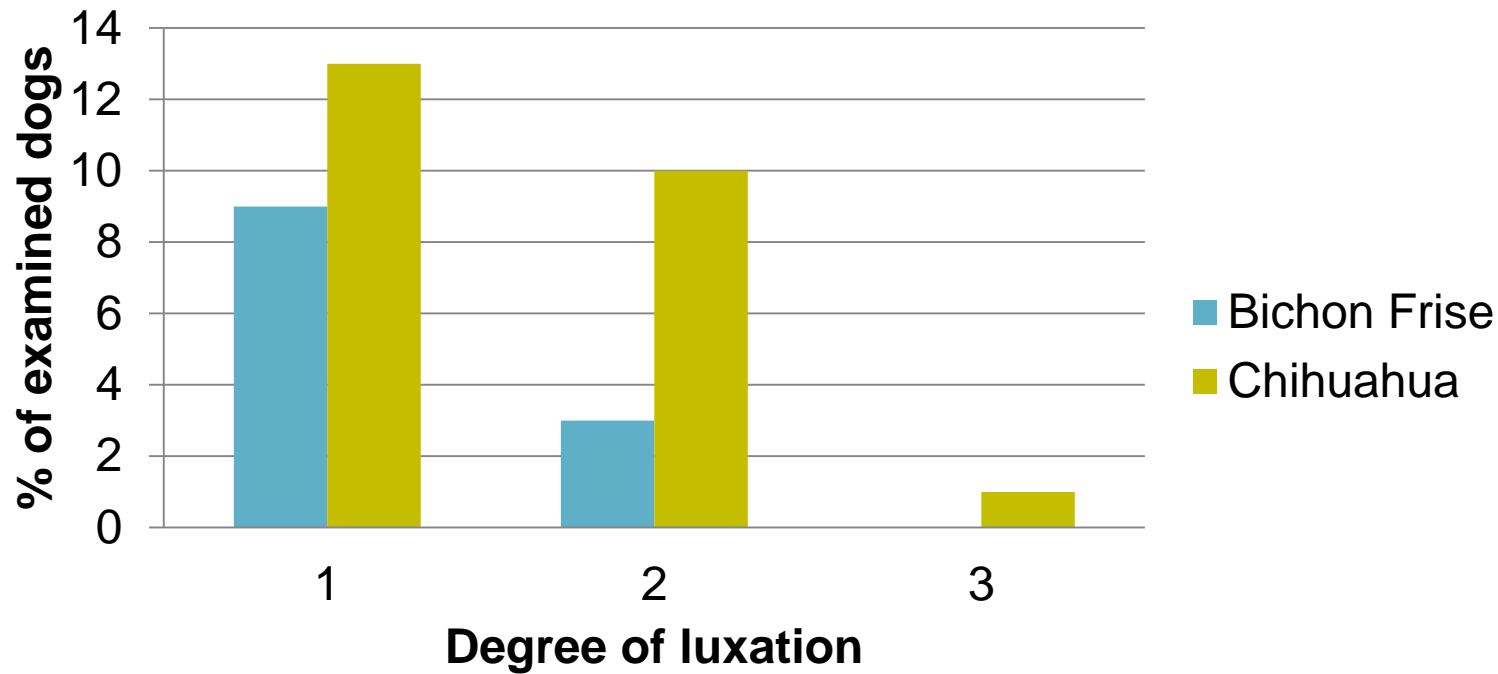
Bichon Frise

- 1036 records (1997-2012)
- 20% of registered dogs
- Health program from 2005

Chihuahua

- 7024 records (1999-2012)
- 38% of registered dogs
- Health program from 2009

Prevalence



Genetic analysis

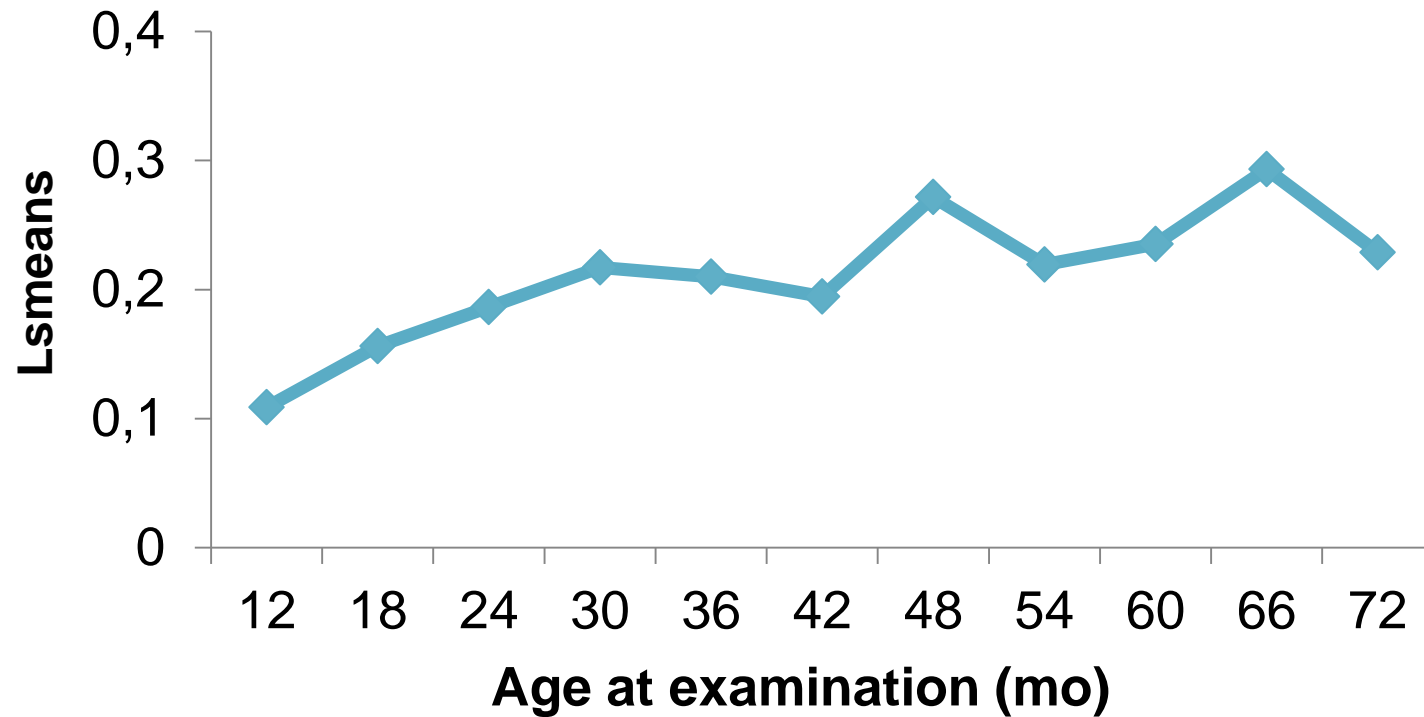
Dogs were defined as affected or unaffected (0 or 1)

Mixed linear animal model, using DMU

Model:

$$\textit{Patellar luxation} = \textit{sex} + \textit{age} + \textit{vet} + \textit{animal} + e$$

Effect of age at examination



Effect of sex

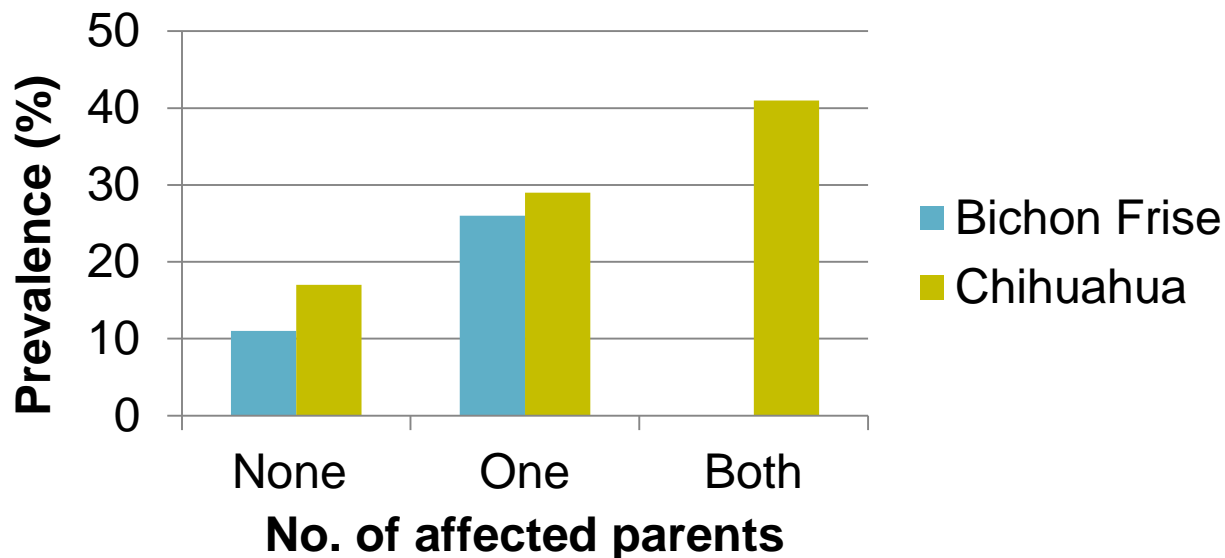
Higher risk for females

Odds ratio females/males: Chihuahua 1.2

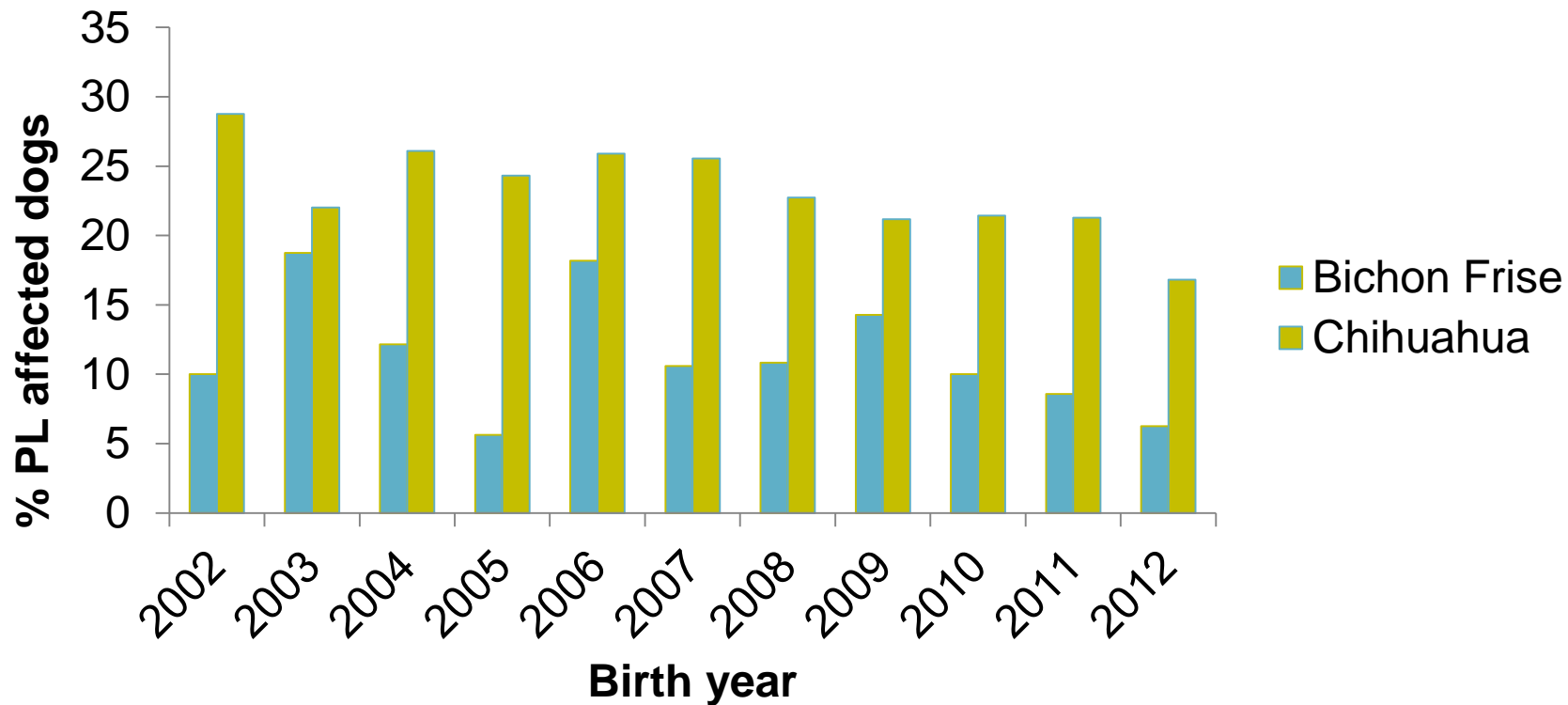
Bichon Frise 4.3

Genetic analysis - results

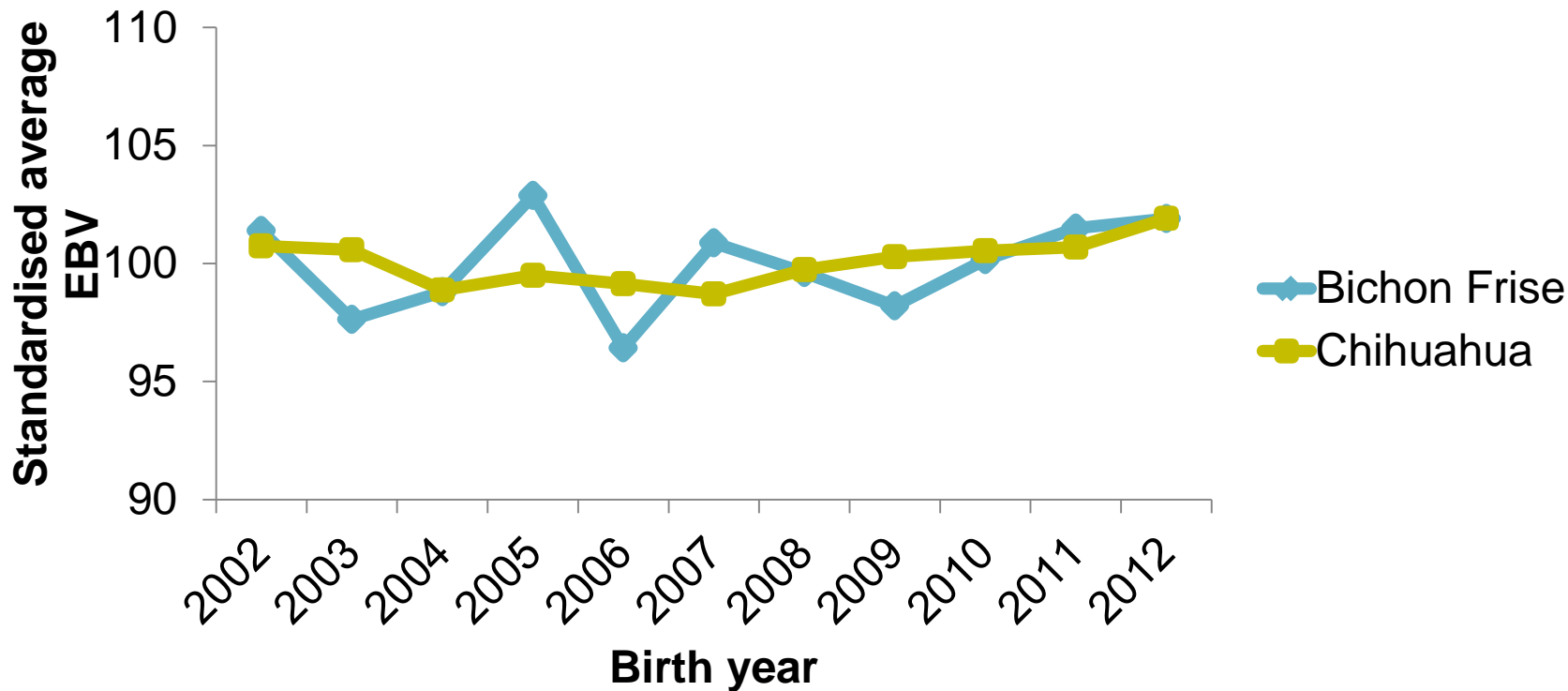
Estimated heritabilities of 0.18 (Bichon) and 0.22 (Chihuahua)



Phenotypic trend



Genetic trend



Summary of results

Moderate heritabilities

Chihuahua had higher prevalence and more severe cases

Females more affected, especially in Bichon Frise

Proportion of affected dogs increased with age

Conclusion

Patellar luxation is a heritable disease in Swedish Bichon Frise and Chihuahua

Current health programs would benefit from EBVs

Dogs should be examined later in life