The inclusion of international level showjumping results in the genetic evaluation of Irish Sport Horses

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Background

- Breeding objective

  "to produce a performance horse that is sound, athletic with good paces and suitable temperament and capable of winning at the highest international level in FEI disciplines"
- Irish breeders prioritise showjumping and eventing
- Crucial that genetic evaluations include international performances

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Existing methodology

- Genetic evaluations for showjumping have been carried out in Ireland since 1995
  - Multi-trait repeatability animal model approach with high, medium and low levels of performance treated as separate but correlated traits
  - Measure of Performance: normalised score based on ranking in each competition
  - International level performances were not included

Career Progression

Data collection

No central comprehensive database of international level performances

- FEI database does not include all international performances
- Focus has been on results counting towards Rolex rankings

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Data collection

At major shows, not all classes are recorded by the FEI

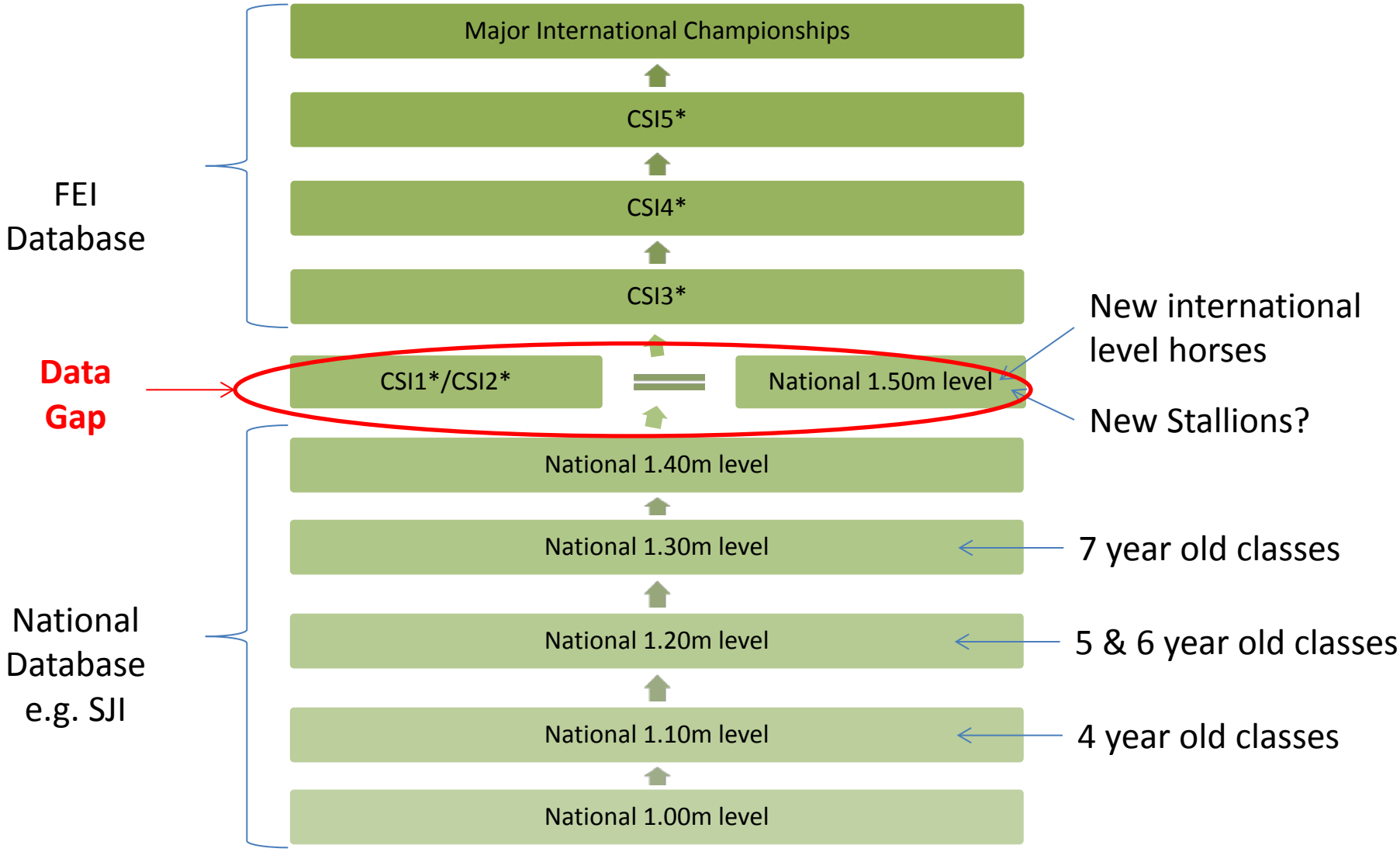
e.g. Dublin CSIO5* but similar situation exists for all major shows

Year	No. international classes	No. recorded in FEI database
2012	18	12
2011	18	6
2010	18	7
2009	18	7
2008	18	0
2007	18	0

Data collection

- Not all international level shows are recorded by the FEI
  - Very little data on smaller international level shows, e.g. shows at CSI1* and CSI2* levels
  - No results on over 75% of classes at CSI1*/CSI2* level in Ireland in 2012

Career Progression



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How to fill the data gap?

- Manual collection of international level performances for ISH horses is required
  - Aim is to augment data available from FEI
  - Number of sources used, e.g. Jumpfax, Show Jumping Archive …
  - Also, collate performances at foreign national level, e.g. classes in US
  - Resource-intensive process

Data collection

- Issues with data quality
  - Horses frequently change name
  - UELN is not always available
  - Pedigree is often not recorded
  - Studbook may not be recorded

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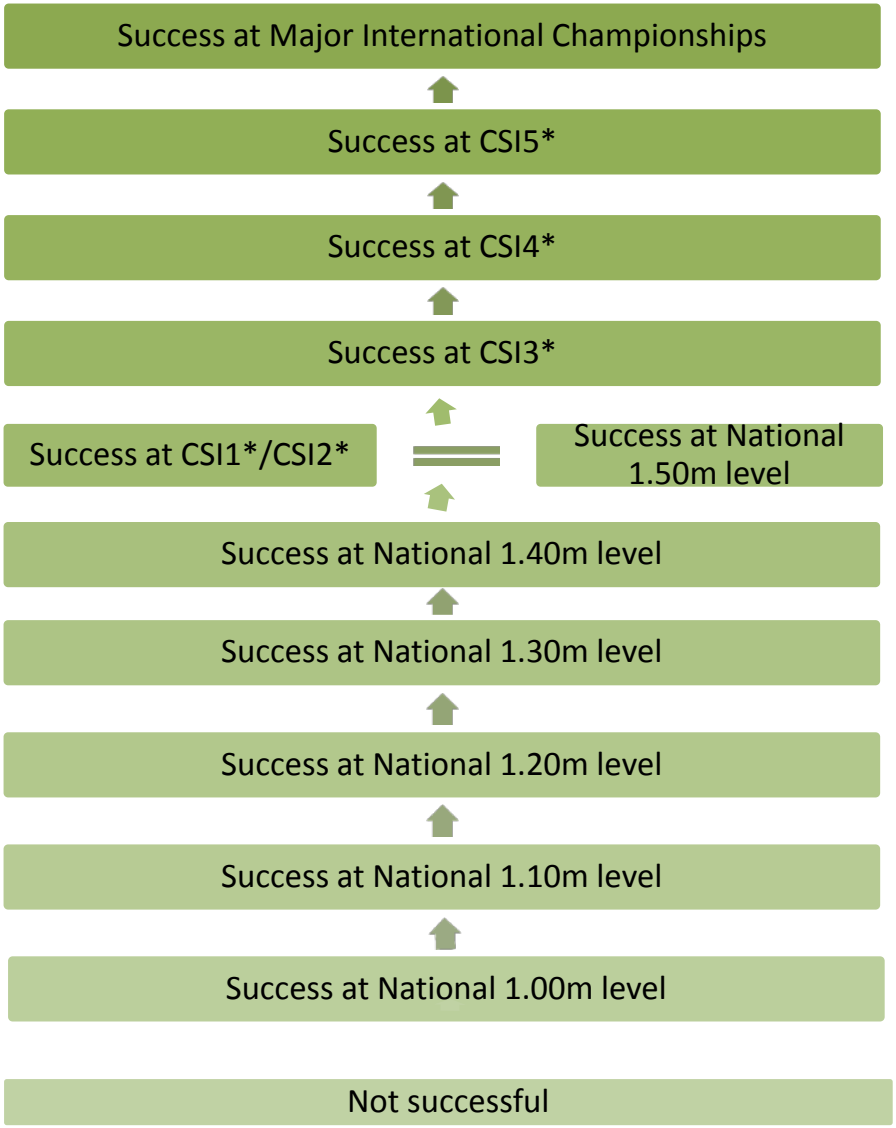
Lifetime Performance Rating (LPR)

- Not feasible to collate individual performances in each class for each ISH horse
- Focus is on assessing the “highest level” successfully achieved by a horse during its lifetime
- Success = Two double clear rounds at a particular level
- Similar to the approach taken by the Netherlands genetic evaluation and recent Belgian research
- Difference – highest level successful vs. highest level competed

Lifetime Performance Rating Levels



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Data used

	No. of records
Number of performances	1,119,770
Number of horses	16,727
Maximum number of performances per horse	535
Mean number of performances per horse	35.5
Number of stallions	1,780
Mean number of progeny of stallion	9.4
Maximum number of progeny of stallion	559

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Model used

- LPR model
  - Fixed effects of sex, year of first performance and Thoroughbred percentage
  - Random effect of animal
- National model
  - Fixed effects of age, sex and grade of performance
  - Random effects of animal and permanent environment

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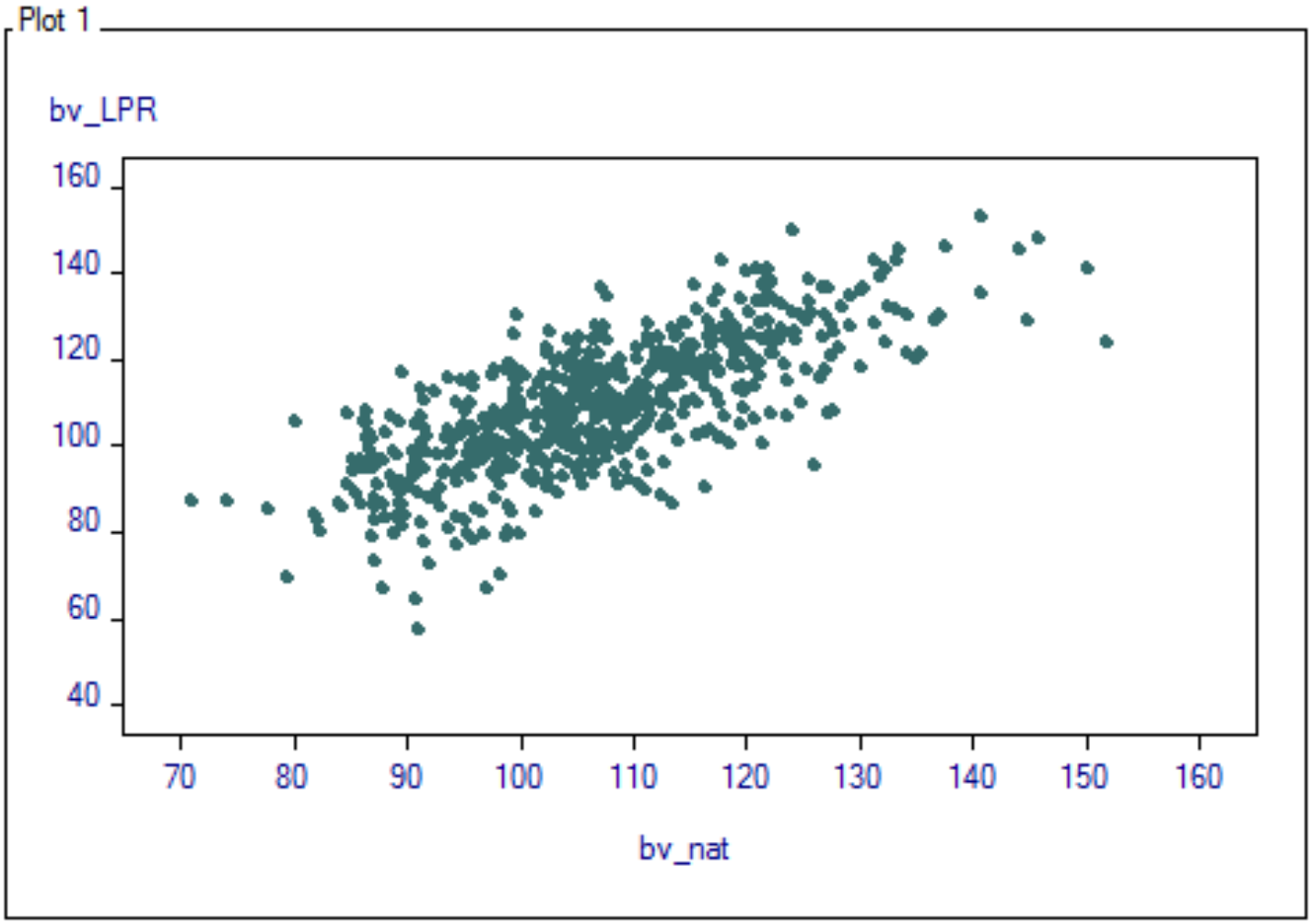
Genetic Parameters

- AS Reml Software used
- Genetic Variance: 0.66 ± 0.049
- Phenotypic Variance: 2.41 ± 0.029
- Heritability of LPR = 0.28 ± 0.019
- Genetic correlation between LPR and national Grand Prix level (1.40m/1.50m) = 0.96

Correlation between EBVs

Published stallions = 0.77



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Conclusions

- Relatively large effect on the EBVs and rankings of stallions
- Reflects a decrease in emphasis on young horse results
- LPR methodology better reflects the breeding objective
- Published in spring 2013

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