



Big Data

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Big Data

Big Data: What is it?

Big Data is like teenage sex:

- Everyone talks about it
- Nobody really knows how to do it
- Everyone thinks everyone else is doing it
- So, everyone claims they are doing it.



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Big Data has some Big Problems

- Could have had multiple sub-groups on specific issues/topics

- Challenges
- Existing solutions
- Shaky first steps
- Actionable ideas





Challenges for Big Data

- Mechanical: Data Storage, Data Transfer, Data Analysis
- How to get Big Data into a format breeders/the public can use and benefit from
- How KCs can use Big Data



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Challenges for Big Data

- Integration of genomic data with clinical data/phenotypes
 - Who is providing the phenotypes?
 - Is the phenotype data update-able?
- Which variables need to be built into the model as covariates or fixed effects?
 - Example: Correction when using different methods for hip rads to assess dysplasia





Challenges for Big Data

- Lack of standardization
 - Diagnostic codes
 - Identity of dogs
 - Data formatting
- Protection of human-associated data (identification, address, etc.)
 - EU GDPR (General Data Protection Regulation)
- Consent
 - Consent for breed tool is not necessarily permission to use that data for research (and vice versa)
- Money





Let's Not Reinvent the Wheel

- We are all a bit jealous of the Netherlands where:
 - All registered puppies also get their genome-wide SNP data generated
 - This is connected/combined with clinical data

- OFA: Breed Health Surveys
 - Templates, customizable
 - Freely available
 - Anonymized and not updateable



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Next Steps Not 100% Clear

- Education of breeders/the public
 - Genetic tests are not unequivocal destiny
 - Turn complex Big Data into facts
 - Example: 1% increase in IBC equals average 8 less days of life for your dog
 - Teaching them what the heterozygosity measures they are now getting actually mean and how to use them (one piece in big puzzle)
- Start with a small pilot project with specific goal(s)
 - Project would utilize Big Data
 - Possibly use a breed small in numbers where the gene flow is much more global
- International ID problem: cattle, horses are more standardized. Is this doable with dogs?
- Use of machine learning for gleaning helpful data from some of the free-form fields (for example in VetCompass)



Specific/Actionable Idea #1

- Webpage maintained on IPFD which collects (and annotates) scientific papers on specific topics
 - Provide a lay summary paragraph
 - Example: Proof that science does support EBVs as a useful breeding tool
 - EBVs in dogs are...not perfect
 - Can point breeders here so it's not just "my word" – here is the collected scientific proof
- (What about GBVs? Takes time to assemble/collect this data, and if breeders do not trust or use EBVs, then why spend the \$\$ on GBVs?)



Specific/Actionable Idea #2

- Another webpage, hosted by IPFD, similar to the GTP list
- List of the “BIG” datasets that various stakeholders currently/already have
 - Example: UK KC has phenotype info on hips, eyes, elbows
 - Genetic testing (without a long list) – genome-wide data (like SNP data) and/or single-gene diseases and traits
 - What datasets are associated with the GRLS?
 - Does this data have geographic information attached?
- Of interest to owners, breeders, researchers, and others in the Big Data field
- Email Aims with updates (like you already do for GTPs)



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Specific/Actionable Ideas #3 and #4

- Could IPFD provide a template consent form?
 - Not just for this immediate DNA collection, but for all future research

- Create an EBV Working Group





Estimated Breeding Value Working Group

- Similar idea to brachycephalic working group (out of Windsor conference)
- Charge: Explore how EBVs are used currently in dogs, how they could more effectively be used, how to educate breeders on EBVs (short videos?)



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What are Estimated Breeding Values?

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The End

