Dog health and welfare in the UK, 2014: three compelling reasons to review and regroup, now.

A discussion document in response to Bellumori et al (2013) and O'Neill et al (2014).

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Note on terminology: Within the context of the narrative the terms pedigree, purebred and cross breed have proved to be problematic because they are used inconsistently across the original source welfare reports of 2009 and 2010. In the main it is generally understood that the term *purebred* is used to describe a dog born of parents of the same breed, *pedigree* is used to describe a dog bred within the Kennel Club system and *crossbreed* to describe a dog born of parents from different or mixed breeds. However, in the welfare reports referenced the terms pedigree are often used to denote all dogs born of parents from the same breed.

> “If we are going to make good decisions, we must think very carefully about the questions. Then, we must make decisions on the basis of really understanding the issues at a deep level rather than on a dogmatic precept or misunderstanding. We must apply scientific analysis to whether dogmatic constructs are actually true or false.”
>
> Professor Sir Harry Kroto 2013

> “If they can get you asking the wrong questions, they don't have to worry about answers.”
> — Thomas Pynchon, *Gravity's Rainbow*

Questions asked of dog health and welfare

Dog lovers of every hue can unite in the single aim of wanting to make good decisions about the health, welfare, care and fulfilment of their dogs. The best decisions in fact. It is five years since a flurry of reports on dog health and welfare (Rooney and Sargan 2009, APGAW 2009, Bateson, 2010), in which a great many questions were asked. They were asked because of growing concerns that people were making increasingly poor decisions about their dog’s health and welfare. They were asked in the hope that by answering them, better welfare decisions would be made by both dog breeders and buyers. Now, with the benefit of not just time and distance, but emergent research from projects such as VetCompass and institutions such as UC Davis, it would be prudent to reflect on how relevant and helpful the arguments made some five years ago, remain.

It has been a decade for spotlighting the decisions our society makes about dogs. Whether it be media vets questioning pedigree dog breeding (Milne, BBC Real Story 2004), DEFRA including the breeding of dogs in the Animal Welfare legislation (2006), animal protection campaigners highlighting the suffering of pet dogs (One Kind, formerly Advocates for Animals 2006), harm caused by puppy farms (Marc Abraham, online petition 2013) or the Kennel Club asking its most probing questions, to date, on breed health (BSAVA Breed Health Survey 2004). The decade clearly kicked off with a scurry of activity looking at dog welfare and those lines of inquiry have rightly continued. However, for the purposes of the exercise here, the focus is on the three main reports that are arguably the most influential.

- Pedigree Dog Breeding in the UK: A major welfare concern? Nicola Rooney and David Sargan 2009
- A healthier future for pedigree dogs, APGAW
- Independent Inquiry into Dog Breeding, Patrick Bateson

This is a review of those three welfare reports, revisiting the questions they posed, the questions they did not ask and a dissection of the assumptions made. Consideration is also given to the potential value of wider thinking i.e. that taken from disciplines other than veterinary science, to see what implications that has for the ongoing lines of inquiry. The aim here is to reflect on whether access to a growing body of research data, together with an injection of new thinking might ensure the questions being asked about dog health and welfare are the most appropriate and will yield maximum leverage in securing better behaviours, attitudes and choices around dog ownership. Leverage that results in reduced animal suffering.

Purpose and scope of the three reports

The explicit starting point for two of the reports, APGAW and Bateson, was the arguments set out in the BBC's Pedigree Dogs Exposed (PDE, BBC 2008), which, obvious from its title chose to focus on the plight of pedigree dogs only (for a discussion on the assumptions made in that documentary see Robinson:2012). Rooney and Sargan did not directly refer to PDE as their starting point but their focus too was the pedigree dog population, as directed by the RSPCA who commissioned the report. See Table 1 for a summary.

Report title and authors	**Pedigree Dog Breeding in the UK: A major welfare concern?** Nicola Rooney and David Sargan	**A healthier future for pedigree dogs** APGAW	**Independent Inquiry into Dog Breeding** Patrick Bateson
Date	February 2009	November 2009	January 2010
Funding	RSPCA	APGAW	Dogs Trust and Kennel Club
Starting point	Concerns over the welfare of dogs caused by selective breeding.	Arguments set out by Pedigree Dogs Exposed	Arguments set out by Pedigree Dogs Exposed
Reason for report	"It hopes that this report will be seen as a constructive contribution to the current debate on the welfare of pedigree dogs."	"The inquiry was set up to investigate the welfare issues surrounding pedigree dogs in the UK, to identify factors which may improve standards at all stages of dogs' lives, and to advise on potential measures suitable for secondary legislation concerning the issue under the Animal Welfare Act." P 12	Request from Defra for a fuller inquiry into dog breeding.
Key questions asked	Extent of the welfare issues attached to selective breeding for extreme morphological traits Extent of the welfare issues attached to the increase in inherited diseases linked to selective breeding	What is the problem in pedigree dogs? What are the specific health and welfare concerns? Are current health schemes adequate? Are current Codes of Ethics adequate? Structure of the dog breeding world? (Their definition of this was in fact just the KC pedigree dog breeding world). Involvement of the veterinary profession. Legal infrastructure. Sale of goods and the consumer.	Do welfare issues arise from dog breeding, if so what and which constituent of dogs i.e.: breeds, cross-breeds or no-pedigree do they affect? What are the tests and systems available to address the issues? How should future efforts be led and funded? How adequate is the Animal Welfare Act? If more safeguarding is required what should that look like? Does breed purity outweigh all welfare considerations? If so give examples.

Table 1. Summary of purpose and scope in three key reports on dog breeding

Statistics show that pedigree dogs make-up the large proportion of the UK dog population so perhaps on that basis alone the focus on their health and welfare could be justified (O'Neill et al 2014:11). Whilst the scope of the Bateson Inquiry was broader in its aims, there was a tendency for the questions to narrow down to the purebred dog population and the KC registered section in particular.

Assumptions in the three reports

An examination of the key assumptions made in each of the reports reveals much about the thinking behind them at the time. See Table 2 for a summary.

The standout assumptions made in all three reports are:

- Placing so much scrutiny on the Kennel Club is justified because that is where the problems have come from and it is through improvements in the KC system that all dogs' health and welfare will improve.
- Breeding to a physical aesthetic began with and is mainly driven by the show community.
- Whilst the veterinary profession and the puppy buyer have roles to play, it is dog breeders that are most culpable for health and welfare issues.

Additionally one or more of the reports assumed the following:

- That cross breed dogs do not share the same health and welfare issues and according to at least one of these reports, enjoy "significantly" longer and healthier lives.
- The show world is a major influence over dog health and welfare.
- Other welfare stakeholders have no case to answer.
- That despite strong consensus that there has been insufficient research and data collection on the issues, it is justifiable to

    a. Blame the KC and breed societies for not achieving more on dog health and welfare
    b. Proceed with recommendations as to what they should do from now on.

It is impossible to carry out research without making assumptions so there is no surprise that they are found here. Good management research practice suggests that those assumptions should be acknowledged, exposed and subject themselves to evaluation (Gill and Johnson, 2010:7). To debate whether these were valid ones to make at the time is fruitless. What needs to be done is review their validity, from this point forward, in the light of emerging clinical data research and new thinking.

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Funding	RSPCA	APGAW	Dogs Trust and Kennel Club
Notable assumptions made in each report.	Selective breeding practices have compromised the health and welfare of dogs. P7 Selective breeding practices only impact on pedigree dogs. P7 Society and sections of the vet professions are desensitised to welfare issues p7 The differential life expectancy between pedigrees and cross breeds is significant. P7 Despite insufficient research into these matters making "the problem difficult to assess", proceeding with recommendations is justified. P7 Efforts by breed societies and kennel clubs have been ineffective at protecting the welfare of many breeds. P9 Selective breeding for diverse conformation began with the emergence of dog showing.p9 Trends in dog showing have major implications for wider dog population. P9 Addressing issues through the KC breeding system will improve the situation for all dogs. P37	Choice of pet can be legislated for p43. Codes of Practice will influence choice of pet. P44 Views that the KC has not taken responsibility for the health and welfare of registered dogs can go unchallenged. P38 Expressions of lack of trust in the KC do not need to be validated. P38 Addressing the health and welfare issues in the KC population will positively impact dogs in the wider population. P13 KC bred dogs should be the focus of inquiry because it is the predominant registry. P15 Modification of breed standards will address health and welfare issues. P37 Breeding for aesthetic qualities is a result of dog showing. P15 Buyers will make better choices of pet if they had access to better and more transparent information on health and welfare. P48 and p50	Recommendations can be made on the evidence submitted in 135 responses. P19 Breeding competitively to succeed in shows has become a major preoccupation. P8 Many people simply "know" what it is like to be a dog.p11 Desire for purity often wins over fears about inbreeding. Demand for dogs from the public plays a role but no need to understand that for this purpose. P41 Charities are making substantial efforts to educate the dog-buying public. P41 Effective change will be brought about by a mixture of encouragement, guidance and enforcement. P35 Little consideration has been given to the culpability of the buying public but no need to prioritise that here. P41.

Table 2. Summary of notable assumptions made in each report.

Please note the table does not contain direct quotes but refers to the underlying assumptions found in the text at those page references. It is acknowledged that different readers of the text may identify different sets of assumptions.

Recommendations made in the three reports

Having asked their questions and made their assumptions all three reports proceeded to make recommendations, a summary overview of which is in table 3 below. There were over 40 recommendations made in total, and they have been reviewed here in terms of their focus, be it the supply, demand or both sides of the dog acquisition socio-economic exchange. Also for the constituency targeted, i.e. all dogs or parts of the dog population.

Report	Total Number of recommendations	Focus			Target Constituency		
		Supply	Supply and Demand	Demand	All Dogs	Purebred dogs	KC Dogs
Rooney and Sargan	**22**	14	5	3	8	6	8
APGAW	**7**	3	3	1	2	0	5
Bateson	**12**	8	3	1	7	0	3

Table 3. Summary of the focus and target constituencies of the report recommendations
NB. 2 of the recommendations in Bateson target licensed breeders and are not included in the target categories. APGAW made over 40 points but not all were recommendations, some were suggestions and advisory in nature.

As the table shows the majority of recommendations focused on the breeder side, the supply side, very few focused on the demand dynamic. 17 recommendations targeted all dogs and 22 targeted purebred dogs, of which 16 targeted KC dogs only and one or two of those could be narrowed further to that of just the show community. More detailed tables on the recommendations made in each report can be found in the annex, page 20.

Given the purpose and scope of the reports and the nature of the questions posed there is little surprise that so many recommendations were aimed at purebred dogs and no surprise that the Kennel Club system came in for particular attention.

Common themes emerged from all three, for instance the call for more robust data, the need to develop breed specific actions and strategies and a call for further review of the Kennel Club registration rules and content of breed standards.

There were glaring contradictions in some of the lists of recommendations, for instance Rooney and Sargan's call for increased genetic diversity whilst the same time calling for KC registration to be more restrictive.

Perhaps more of a puzzle is why so little attention was given to the impact and implications demand has on welfare issues.

Nature of bias

"When you can't make them see light, make them feel heat"
President Ronald Reagan

The presence of bias is to be expected, as it exists in all human endeavour, and indeed is here in this discussion of the three reports. However if there is failure to reflect and acknowledge its consequences then it becomes much more problematic. The purpose, scope and assumptions within all three reports undoubtedly puts limitations on the recommendations made, but also influences the questions that were not asked, or at least not given much emphasis. From the undeniable bias in these reports some clear inferences can be drawn.

- That there is a strong belief that purebred dogs are more of a concern in terms of health and welfare than other types.
- That despite some acknowledgement that many thousands of dogs are bred outside the KC system, pressure to bear there, will automatically benefit dogs as a whole.
- That putting pressure on the show community in particular will bear fruit in terms of improved health and welfare of all dogs.
- That pressure on the supply side, as opposed to the demand side of dogs will address the current welfare and health issues of all dogs.
- That whilst there clearly is a need for more research and data collection on prevalence of disease and health issues there is no need to put a similar call out for more data and research in other aspects of dog buying and ownership.
- That over and above calling for an independent advisory council to oversee progress, there is no need to outline in any more detail how that progress can be secured.
- The call for the council to be made-up of people who are independent of the Kennel Club is a) valuable and b) workable
- That the recommendation for stakeholder collaboration and collective funding will of itself be enough of a prompt to secure it.
- That although, as Bateson identifies, this constitutes a massive people management issue there is no need to include on the council, expertise in people management, the management of change or the drafting of effective social policy.
- That stakeholders that escaped scrutiny in these reports had no case of inertia or ineffectual action to answer themselves.
- There is no urgency to address the root cause of welfare issues.
- That proceeding with this degree of bias is workable.

The bias has had consequences.

There is no doubt that many within the KC system felt the singling out of their breeding practices and accusations of longstanding inertia, was unfair and indeed Bateson agreed with them to an extent (Bateson, 2010:35, 41) Resources both time and money were invested in attempts to address that unfairness, when those resources could have been put to more constructive use elsewhere. Additionally, and understandably, that community of breeders by and large became very defensive. Not a good starting point on which to build a collaborative transformational way forward. Especially, a transformational way forward in which the Kennel Club community was key. Despite all three reports being confident that

pressure brought to bear on the KC system would benefit all dogs in the long run, highly suggestive that the KC is central to the issues, the recommendation was to deliberately exclude it from the Dog Advisory Council (APGAW, 2009:38). The suggested structure of that put great store on it needing to be independent of the Kennel Club, presumably because of the perceived issues of mistrust. No-one, however, at the time explored whether there was a sound basis for that mistrust.

Time and distance does reveal the distinct bias within the welfare reports. Their narrow-mindedness and the weakness of links between evidence they collected and conclusions they drew is glaring. But this does not reflect on the people who drafted them. It reflects on the bounded rationality in which they were produced. There were limitations on them in terms of time, resource and access to evidence/ data from all parts of the dog health and welfare system. Furthermore, at the time they were written a great deal of heat had been injected into the welfare debates. The heat was sincere not sinister. It was felt by some that the matter of breed health had become very urgent.

The recommendations made in the three welfare reports were based on imperfect information and data. The report authors each acknowledged this but external pressures presumably meant that these ideas and suggestions "satisficed" at the time.[1] That is a deliberately clumsy term to describe a process that needs to be handled with caution. Bateson suggested that the urgency of the welfare issues were such in 2009/2010 that action was warranted immediately, even within the context of imperfect data (Bateson 2010:43). But he did not lose sight of the importance of robust data in the process of developing sound breed health and welfare strategies, i.e. strategies that presumably no longer "satisficed" but were truly effective (Bateson 2010:36).

Subsequent actions following the welfare reports

Having made recommendations actions were taken to begin the implementation process.

An Advisory Council on the Welfare Issues of Dog Breeding (commonly referred to as DAC) was set up towards the end of 2010 and is constituted by people who are notable, credible and highly regarded in their fields. Each member was already making a significant contribution to dog health and welfare in their own specialisms and institutions, and have continued to do so. They published a progress report on the Council's achievements so far in 2013.

The Kennel Club has implemented a vast raft of actions, schemes and initiatives tackling health and welfare from a number of angles (KC Dog Health Group Annual Reports 2011, 2012, 2013). They might argue that many of these had their origins in decisions made long before these reports and indeed an examination of the history of pedigree dog health and welfare (Robinson, 2014, yet to be published) would suggest some validity in that argument. However there is no doubt that under this spotlight many new developments accelerated.

Microchipping is to be made compulsory from 2016.

Stakeholders such as the RSPCA and Dogs Trust funded the VetCompass project.

[1] The term "satisfice" was first used by Herbert Simon to describe the behaviour of making decisions that meet needs adequately in the face of imperfect information. SIMON H Models of Man 1957

Insight from recent research and data

The body of research from VetCompass began to emerge in 2010 and more recently a major report on prevalence data was published (O'Neill et al 2014). The findings of that together with those from a similar report from UC Davis June 2013 (Bellumori et al) are summarised in tables 4 and 5 on pages ten and eleven.

The sample sizes in both were large, the data collection process was carefully designed and the assumptions and limitations of both methodologies were openly acknowledged and discussed. Making both, highly credible pieces of research. This type of research has huge legitimacy coming as it does in the wake of calls for such an approach in all three welfare reports. Furthermore, with all three reports assuming that poor choices in dog breeding and buying could be explained, at least in part, by the lack of accurate prevalence data, its impact might change breeding and buying habits for the better. This in turn would improve dog health and welfare. There was considerable anticipatory hope awaiting this research.

However, the reception given to this emerging data seems strangely muted. To date (mid-June, 2014) there has been no comment made on it by the Dog Advisory Council, the Dogs Trust, the RSPCA nor officially the Kennel Club. The more high profile pedigree dog blogs have not posted on it either. Bearing in mind Bellumori was published in June 2013 and O'Neill in March 2014 this does feel odd.

Sadly, where there has been a reaction there appears to be little excitement around the new insight this research affords. Instead insight is being largely ignored in favour of cherry-picking the findings in order to support well-rehearsed arguments defending entrenched positions. Which is regrettable. Here in the UK both the national and canine press chose to characterise the findings from O'Neill et al along the familiar lines of purebreds versus mongrels (Daily Mail April 2014, Daily Telegraph April 2014). In the canine press the headlines were not as dramatic but ensuing debate still reveals that entrenched positions, namely the purebred versus cross breed divide, are hard to relinquish (see discussion following a piece by Lee Connor in Dog World May 8th 2014 for an example). The notable exception was comment in that same edition of Dog World from Professor Steve Dean (the current KC Chairman) who was measured and considered in his analysis. Furthermore he recognised the value of this research in assessing the validity of previously held beliefs, some might say dogmas, over dog health and welfare.

Reasons for stakeholder silence on the matter are pure conjecture at this stage. It would, however, be discouraging if the silence is due to their disappointment in the findings as that would suggest they did indeed harbour dogmas rather than embrace scientific fact. If these data sets had concluded that cross breeds enjoyed significantly better health than purebreds, as was claimed for many years, their reaction may have been different. It can only be hoped that there are different reasons for the absence of comment.

The character of this reception is, however, a great shame because these two recent papers undoubtedly say something about selective breeding, which was the major preoccupation of the welfare reports in 2009 and 2010.

Paper and date of publication	Location of research	Timeframe of Prevalence tracking	Sample size	Disorders included	Context	Headline Indications	Suggested follow-up
Bellumori et al Published June 2013 JAVMA Vol 242 No 11 pp 1549 - 1555	US	Jan 1st 1995 – Jan 1st 2010	90,004 dogs	24 inherited disorders selected before research undertaken. Hemangiosarcoma, lymphoma, mast cell tumour, osteosarcoma, aortic stenosis, dilated cardiomyopathy, hypertrophic cardiomyopathy, mitral valve dysplasia, patent ductus arteriosus, ventricular septal defect, hyperadrenocorticism, hypoadrenocorticism, hypothyroidism, elbow dysplasia, hip dysplasia, intervertebral disk disease, patellar luxation, ruptured cranial cruciate ligament, atopy or allergic dermatitis, bloat, cataracts, epilepsy, lens luxation, and portosystemic shunt. . NB. The disorders chosen were those believed likely to show differences between purebred and crossbred dogs based on current beliefs about inherited disorders.	Large university based teaching hospital on west coast of America. Funding source is not stated.	Of the 24 disorders looked at, there was no difference in expression in 13. Pure-bred dogs were more likely to have 10 of the disorders, mix-breeds more likely to have just one of them. "…..genetic disorders were individual in their expression throughout the dog population. Some genetic disorders were present with equal prevalence among all dogs in the study, regardless of purebred or mixed-breed status."	Emphasises the value of genetic testing and screening to reduce disorders in the dog population as a whole. Some disorders may need intervention from breed registries. Implies breed specific strategies are required for those breeds that present with higher prevalence of some disorders. See Table 2 for list of breeds specified.
O'Neill et al March 2014 PLOSOne	UK	Sept 1st 2009 – March 31st 2013	3,884 dogs randomly selected from 148,741 dogs attending 93 clinics. Breakdown of sample: Crossbred 20.5% Purebred 79.4%	84 disorders and syndromes which emerged from the research data broken down as: 20 most frequent disorders 20 most frequent mid-level disorders 8 body systems 15 organ systems 21 syndromic disorders relating to pathophysiological processes	Large but single group of primary care practices in south east and central England. Research funded by the RSPCA.	Purebreds showed significantly higher prevalence values for 13 of the 84 disorders and syndromes. No prevalence values were significantly higher in crossbreds. Meaning differences were not significant for 71. However breed associations were identified for 28 of the 84 disorders and syndromes with the breeds in question differing considerably between disorders. Disorder burden in cross breed dogs reflects an averaging of that presented across the spread of pure breeds.	Changing disorder prevalence in pure breed dogs should be quantified by analysing cohort health data over time. Acknowledge the role of both genetics and environment in future canine health and welfare research. Generate accurate data on disorder severity and duration. Switch the public focus from purebred/crossbred comparison to comparison between breeds

Table 4. Summary of the Bellumori et al and O'Neill et al papers

Table 5: Breed specific prevalence issues to emerge from Bellumori and O'Neill papers

Bellumori et al		O'Neill et al
Aortic stenosis Mixed breed 0.15%	Newfoundland (6.8%) Boxer (4.49%) Bull Terrier (4.10%) Irish Terrier (3.13%) Bouvier des Flandres (2.38%)	33.3% of disorders/syndromes evaluated had breed associations broken down as Diagnosis level 20% Mid- level 40% Syndromic terms 34% High Risk breeds in question were reported as differing greatly and were not listed individually in the paper unless they were one of the seven most common breeds in the study. Some breed specific data focused only on the seven most common breeds in the study: Labrador, Staffordshire Bull Terrier, Jack Russell, Cocker Spaniel, German Shepherd, Yorkshire Terrier, and Border Collie.
Dilated cardiomyopathy Mixed breed 0.16%	Dobermann (7.32%) Great Dane (7.30%) Neapolitan Mastiff (6.52%) Irish Wolfhound (6.08%) Saluki (5.88%)	
Elbow dysplasia Mixed breed 0.9%	Bernese (13.91%) Newfoundland (10.28%) Mastiff (6.55%) Rottweiler (6.31%) Anatolian Shepherd (5.41%)	
IVDD Mixed breed 4.43%	Dachshund (34.92%) French Bulldog (27.06%) Pekingese (20.59%) Pembroke Welsh Corgi (15.11%) Dobermann (12.70%)	
Hypothyroidism Mixed breed 1.54%	Giant Schnauzer (11.45%) Irish Setter (7.69%) Keeshond (6.63%) Bouvier des Flandres (6.55%) Dobermann (6.30%)	
Atopy/ Allergic dermatitis Mixed breed 1.08%	West Highland White Terrier (8.58%) Coonhound (8.33%) Wire Fox Terrier (8.16%) Cairn Terrier (6.91%) Tibetan Terrier (5.86%)	
Bloat Mixed breed 0.20%	St Bernard (3.76%) Irish setter (3.42%) Bloodhound (3.39%) Great Dane (2.80%) Irish Wolfhound (2.70%)	
Cataracts Mixed breed 4.04%	Silky Terrier (22.76%) Miniature Poodle (21.49%) Griffon Bruxellois (20.51%) Boston Terrier (19.61%) Tibetan Terrier (18.92%)	
Epilepsy Mixed Breed 0.91%	Catahoula Leopard Dog (3.90%) Beagle (3.57%) Schipperke (3.42%) Papillon (3.40%) Standard Poodle (3.19%)	
Portosystemic shunt Mixed breed 0.35%	Yorkshire Terrier (10.86%) Norwich Terrier (7.41%) Pug (5.88%) Maltese (5.87%) Havanese (4.35%)	

The new data suggest that overall the differential between purebreds and cross breeds in terms of risk of health and welfare issues is not as significant as once claimed, but it is there. The data set in Bellumori shows that of the 65,952 purebred dogs in the study just under 32% had one of the 24 health conditions they were exploring (see Table 4 for the full list). Of the 22,683 mixed breed dogs in the study just under 26.5% had one of the 24 conditions. If you have a pure breed you have roughly a one in three chance that it will have one of the 24 health conditions they explored, whereas a cross breed gives you roughly a one in four chance of having one of them. The data set in O'Neill shows that 33.3% of disorders evaluated had a specific breed association. Purebreds showed significantly higher prevalence values for 15.5% of the disorders and syndromes evaluated (O'Neill et al, 2014:10). The fact that the data failed to identify differences in 2/3 of the breed analyses is more a reflection of the breed numbers within the cohort rather than confirmative evidence that differences may not exist and as the authors suggest further more detailed breed analyses is warranted. They are very careful to point out that this data represent a baseline on which to measure future trends and it is the trends that are all important and they concluded that this "suggests that the overall disorder burden within crossbred dogs may reflect the overall disorder burden in purebreds at any point in time" (O'Neill et al, 2014:11).

The longevity report from VetCompass suggests that on average a cross breed lives 1.2 years longer than a purebred (O'Neill et al 2013). A differential much less marked than some of the references used in the three welfare reports suggested, for instance the Advocates for Animals report "The price of a pedigree" (2006:5).

For some this differential will remain significant. But significant for what? A re-reading of the three welfare reports shows they assumed that if the puppy buying public had access to more prevalence data that alone might change their buying decisions. But there was no attendant inquiry or analysis of the drivers behind people's buying decisions. Breed related health issues have become increasingly high profile through recent media interest and trends in breed preferences continue to wax and wane. But is there a correlation? For instance, the annual registration comparisons for 2009 and 2013 for some breeds frequently singled out for health and welfare issues are:

	2009	**2013**
Cavalier King Charles	8884	5145
Pugs	4769	8071
French Bulldogs	1521	6990
Bulldogs	4217	5769[2]

It would be far too easy to fall into the *post hoc ergo propter hoc* trap here. The truth is there has been no research into why, despite the emphasis given to the disease burdens carried by these breeds, popularity has increased in some and decreased in others. To understand why people choose the breeds or types of dog they do, an analysis needs to be done not just of the triggers that might push them away from that choice, but also the triggers that pull them towards it. Because there is a chance that the pull urge is stronger than the push. All three welfare reports chose to ignore that, an extremely important aspect of dog ownership. To pin all hopes that the VetCompass data alone would shape and mould changes in both breeder and buyer behaviour is folly. To hope that the publication of more convincing data might change human behaviour alone is naïve. The size of the margin between pure breed and cross breed dog is, it could be argued, immaterial in any case when it comes to

[2] www.thekennelclub.org.uk registration figures

changing people's breed preferences. Behavioural science shows the factors that influence choice are complex (Tversky and Kahneman, 1986).

Question marks over the size of the differential between crossbred and purebred health is not the only new insight presented in the VetCompass findings. The data is suggestive too, that accusations that KC and breed society inertia have hindered progress in dog health and welfare may not be as fair as once thought. A notable observation made in O'Neill et al is this:

"…the current state and predicted trajectory of purebred dog health remain contentious despite….ongoing health measures, suggesting that these earlier breeding reforms that were developed without access to prioritisation information on the overall disorder burden may best have been sub-optimal, and potentially even counter-productive." (O'Neill et al 2014:3)

No one nor any organisation can be blamed for the lack of progress, if that progress was predicated on partial knowledge, flawed assumptions and incomplete science. Dog health and welfare would be better served now by acknowledgement that it has been difficult for breed societies to secure traction in improved health and welfare given the context. The findings of O'Neill et al suggest that now might be the best time to help breed societies create a culture in which they are well disposed to receive the findings of clinical data capture, have the tools and expertise to enable them to understand it, and translate it into effective breed specific strategies. It might be too much of a stretch to suggest that O'Neill's conclusions also challenge the legitimacy of the lack of trust in the KC system. But if the mistrust existed because there was a belief that the KC and breed societies should have done more in a context in which they would have been doing more of the wrong thing, then perhaps it is not so farfetched. Perhaps mistrust was misplaced.

There is no doubt that purebred dog disease has been approached too cautiously in the past four to five decades despite growing concerns over its prevalence. However, to caricature caution as inertia on the part of one stakeholder only, may be incorrect. The reasons for caution are more complex than that.

It has taken some degree of ongoing negotiation with the veterinary profession to secure both the willingness and the capability to collect this type of clinical data, so in fact no fault of breed societies that they have only just now got access to it. Even if inertia was a reasonable conclusion to draw it would be an unhelpful one to dwell on. VetCompass represents a ground breaking opportunity for constructive collaboration between veterinary research and practice that can hopefully inform breed improvement strategies. There has never been a more important moment in the history of pedigree dogs to forge new collaborations with the KC and breed societies. Indeed on the basis of this and other new research to emerge from the Royal Veterinary College, its Centre for Animal Welfare has attempted to do just that. Last November a Building Better Brachycephalics Day was held bringing together key stakeholders to discuss presentations on breed related health data and meetings were held with the Dachshund Breed Council (2014) to discuss follow-up on an IVDD paper. New insight is therefore materialising not just through "what" is being collected at the RVC but also through the manner of "how" it is being collected and worked on.

If stakeholder silence on the output of VetCompass (to date at any rate) is through fear of drawing premature conclusions they may be forgiven. Because there must always be assiduous safeguarding against incorrect conclusions. However if their silence is through fear that the findings will be seen as a direct challenge of their own prior held assumptions and recommendations then opportunities to accelerate progress on dog health and welfare are being missed. That is less forgivable. Furthermore, they are being missed by the very

stakeholder group that shaped the advisory council structure, a structure designed to tackle the problems and implement the actions. The systematic capture of clinical data was the top recommendation made by Rooney and Sargan and the second made by Bateson. Given its high ranking in the actions planned five years ago, its arrival with so little heralding is curious. The relevant stakeholders are right to be measured and mindful in how the research is received and may need more time to digest and evaluate it but, to mark it with no comment whatsoever is disconcerting.

There may be elements in the Bellumori and O'Neill papers that were unexpected, however, not all elements are at odds with the conclusions of the three welfare reports. Both papers clearly reinforce the call for the adoption of evidence based breed specific strategies. Whilst, when taken overall the health differential between cross breed and purebred dogs might not be as marked as once claimed in some quarters, for some health conditions, and many of those are serious conditions, the differential is very marked (see table 5 for more details). For those reasons both Bellumori and O'Neill make strong arguments for the development of a breed specific approach.

This is work the Kennel Club and many breed societies have continued with and their progress is formally reported through the KC's Dog Health Group (DHG Annual Reports 2011, 2012, 2013). Many of these initiatives are financially supported by the Kennel Club Charitable Trust. These endeavours are to be applauded and encouraged by all interested in dog health and welfare. However the analysis by O'Neill et al (2014) expressed concern over the levels of disease found in cross breeds and breed types of dog that might not be within the KC system. Who is responsible for the creation and resourcing of the breed specific strategies to support their health welfare? There is a good chance also that not all the individual dogs in the most popular breed categories, such as Staffordshire Bull Terrier and Jack Russell are registered in the Kennel Club system so they too may fall outside a breed strategy. The clinical capture data analysed to date demands that the health of all dogs be taken seriously not just that of the KC purebred population. This has major implications for mobilisation in all breed communities and suggests at the very least, a rethink of many of the recommendations originally made in the three welfare reports would be timely. Five years down the line a mechanism and strategy on how to include the harder to reach breeder and buyer communities could have been created by now. Should have been created. But failure in this is no surprise given that the three welfare reports were skewed against the KC system.

The result and potential harm of the bias contained within those reports, whilst understandable, takes on a very different complexion in the light of the data now emerging on dog population health. The data changes the context and therefore a review is essential. Access to better data means there is no longer a need to draw conclusions that "satisfice", better data is extending the boundaries of rationality and consequently the questions must now change.

Wider thinking

"If symptomatic solutions are employed as if they are fundamental solutions, the search for fundamental solutions stops and shifting the burden sets in".

Peter Senge The Fifth Discipline (1990:110)

In their welfare report, Rooney and Sargan correctly identified some of "the complexities" of dog welfare issues. Complexity characterised by "many stakeholders and numerous plausible courses of action" (Rooney and Sargan, 2009:5). Bateson said in his executive summary that the issues are not just animal welfare ones but also involve the need to change human, both breeder and buyer, behaviour (pages 4 and 5). APGAW, in implicit recognition of the complexity called for "the KC, other breed clubs, geneticists, vets, behaviourists, welfare scientists and key welfare organisations, such as the Dogs Trust, the RSPCA, and CAWC" to work collectively, pooling research and forming effective strategies.

So whilst the reports hinted at wider issues they failed to consider, in any depth, the need for wider thinking. They did not see a need to draw in expertise from a broader range of other disciplines, from complexity theory, systems thinking, behavioural science, neuroscience, change management, collaborative strategies, psychology, social policy, sociology. The call was to pull in expertise on dog health and genetic science, the logic being that dog health issues required dog health experts. The one concession was to include a legal expert on the DAC. The narrowness of this approach is not an unreasonable mistake to make but there is growing disquiet not just within some quarters of academia but also in significant public social policy areas that the provision of specialist knowledge and academic inquiry is not enough on its own to tackle societal problems. The data alone cannot transform social problems.

The disquiet is summed up effectively by Frodeman in the Oxford Handbook of Interdisciplinarity where he says "the assumption of a linear or automatic connection between knowledge and social benefit has given way to sharp questions about the usefulness of knowledge" (Frodeman, 2010:xxxi). Animal welfare is not considered at all in that Handbook which is a shame, because an exploration of some sharp questions about the current knowledge of dog health and welfare and how that is put to the dogs' benefit is the nub of the issues considered here. However, it did consider issues of complexity around human health and the arguments may serve animal welfare just as well.

In human health there has been a marked paradigm shift in knowledge management. Summed up succinctly by Terpstra et al (2010:514) as a three generational model. See table 6 below.

Table 6: Three generational steps in knowledge management adapted from Terpstra et al 2010

Generation	Paradigm	Philosophy and Character
1.	Linear	Knowledge/ research is a package which can be passed easily from "evidence producers" (i.e. Researchers) to "evidence consumers" (i.e. decision makers). Reductionist and mechanistic.
2.	Relational	Knowledge exchange between collaborative sections within the researcher and decision maker cohorts. Interactive and iterative.
3.	Systems	Decision makers are incohesive, fragmented and disparate resulting in a highly problematical audience for researchers. Complex.

As they go on to argue, no one approach is superior to another, the question is knowing when and where to use which.

Although all three welfare reports alluded to the importance of context and displayed an understanding that the issues in dog welfare are complex their recommendations would largely fall within Terpstra's first generation thinking. Rooney and Sargan, for instance, clearly felt that the public's choice of dog "should be influenced by low prevalence for disease, low insurance premiums and low requirement for surgical intervention at birth" (Rooney and Sargan, 2009:43). That more robust data was needed to demonstrate to the public which breeds and types of dog would provide them with that profile. As if that piece of knowledge alone would be instrumental in change.

The more robust data coming on stream has, so far, demonstrated the health differential between breeds and types of dog remains contentious. Whether these data are causing a problem for stakeholders, and whether that in itself is the reason behind the muted response is, as said before, conjecture. If the hope had been that VetCompass would prove once and for all that mixed breed dogs enjoyed much better health and longevity than purebreds and once armed with that fact, the public would form a long queue to purchase small mongrels from now on, there is little wonder that the data may prove problematical for them. Their anxiety, if it does exist, however is misplaced. Even if VetCompass data revealed an overwhelming differential between breeds and types of dog, that knowledge may not impact people's choices. The big difficulty dogs have, and it is a problem they share with human health and human social policy makers, is that not only are the relevant decision-makers an incohesive group they also fail to make rational and therefore predictable decisions. Even when faced with far more compelling differentials between the consequences of one decision over another. The work of Thaler and Sunstein elucidates the problems policy makers get into when they presume decisions are made rationally in their discussion of "econs" versus "humans" (Thaler and Sunstein, 2008). The problem for dogs is that the people deciding on what to breed and buy are *humans* not *econs*. The emotional pull of breeds is potentially a powerful variable in the dog welfare landscape and yet remains under researched, and one thing is certain, tweaking wordings in breed standards has dubious influence over that emotional pull. The creation of such a diverse range of breeds is not symptomatic of a once burgeoning show world, nor of the directives set in breed standards. The creation of a diverse range of breeds comes from a much more fundamental seed sown elsewhere in the human psyche and is deserving of more probing attention than has been given so far.

Both systems thinking and behavioural science have much to say on the area of choice, the role of uncertainty and the implications these have on policy design. Their contribution has already been eagerly picked up by human social and health policy makers. An excellent overview and contextualisation of the value of behavioural science to social policy is provided by Oliver's introduction in Behavioural Public Policy (Oliver Ed. 2013:1) and Frodeman at al cover systems thinking effectively.

Frodeman advises that "for greater purchase of societal problems" manner is potentially more valuable than method and by manner he means "a sensitivity to nuance and context, a flexibility of mind" (Frodeman, 2010:xxxi.). For those reasons it is argued here that theories taken from systems thinking, behavioural science and its application to public and social policy are rich seams of support and guidance for the work being done in animal welfare. Working with the tools those disciplines provide will broaden and improve the questions being asked, but perhaps more importantly will help to create a much more fertile foundation for collaborative working. One that is more nuanced, contextually sensitive and flexible. The suggestion is not that the members of DAC, or the senior team at the KC, or the charity welfare strategists should quickly become experts in these fields, nor that they have failed

because they have not done so already. The suggestion is merely that people with this type of expertise, from these wider disciplines, be included in deliberations. Without their input, there is a danger solutions will remain only partial in their design.

Three compelling reasons to regroup now

> "A learning organisation is one that is continually expanding its capacity to create its future"
>
> Senge (1990:14)

Compelling reasons to review the progress made so far in dog health and welfare have already been discussed in the sections "Insights" and "Wider Thinking".

New insights: With more robust data coming on stream through projects such as VetCompass it is essential that a receptive, constructive and nuanced platform be created to assimilate that new knowledge and put it into practice. Put it into practice not just within the KC system but across the dog population as a whole. That endeavour will be greatly assisted by adopting some wider thinking.

Wider thinking: The landscape in dog health and welfare requires a sophisticated combination of knowledge management techniques, and therefore the contribution that wider disciplines such as behavioural science and systems thinking can make in addition to veterinary science should be considered as a matter of urgency.

The above are two of the three compelling reasons a rethink is called for. What of the third?

Once published in 2009 and 2010 the three welfare reports, even with their bias and their assumptions and their raft of skewed recommendations were followed by action. That action took on many forms, came from many sources, originated from different perspectives and has had mixed results. That is to be expected. Regardless of the impact of that action so far, one aspect is irrefutable, all those involved be they government minister, member of the advisory council, PhD student, Kennel Club High Profile breed co-ordinator, breed council chair, independent campaigner, e-petition leader, beleaguered dog breeder, or welfare charity policy-maker, all of them will have learnt a significant amount about the challenges faced in trying to implement effective strategies to tackle dog health and welfare issues. One of the biggest disservices that could be done to dogs now, in what would actually be the biggest animal welfare scandal of all time, is if that learning and experience were allowed to evaporate into the ether without all stakeholders optimising the key learning points.

With increased confidence that the data is becoming more robust, with a collective acknowledgement that issues remain problematic but through innovation and collaboration there are tools that can assist with complexity, with a universal eagerness to put new learning into practice for the benefit of all dogs, there has never been a more appropriate or auspicious time to come together for a rethink and regroup on the direction dog health and welfare is headed. With such an amass of talent, experience and commitment to the cause, combined with an open and flexible approach to resources and solutions, now is the optimum time to double check that the best questions are being asked in the name of securing dogs a brighter future. As Senge suggests the questions must deliver fundamental solutions, not just symptomatic ones, otherwise trends in dog health and welfare will never be reversed. Those solutions will only be identified if our capacity to ask the toughest, broadest and most challenging of questions is expanded to the full.

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ANNEXE

Table A1. The focus of **Rooney and Sargan's** Aims and objectives

Aims and objectives (page 38)	**Focus: Supply or Demand**	**Constituency**
Only breed dogs whose anatomy, temperament and genetic predisposition for disease or disorder, make them likely to produce offspring which will experience a high quality of life, free from pain and suffering.	Supply	ALL dogs
Only breed sufficient dogs to meet current demand so that each puppy can be successfully homed in a suitable and caring environment.	Supply and demand	ALL dogs
The public is well educated about the issues surrounding the welfare of pedigree dogs and so is able to make informed choices	Demand	Purebred dogs
Culture shifts such that dogs that are perceived as the most desirable are those which are fit, healthy, are well suited to the lifestyle they lead and have a high quality of life	Demand	All dogs
All those who breed pedigree dogs prioritise the health and welfare of parents and offspring	Supply	Purebred dogs
Breeders only breed dogs that are well suited to the lifestyle they will lead and refrain from breeding those that are likely to experience unnecessary suffering.	Supply	All dogs
Breed standards, breed management policies and breeding strategies are evidence-based	Supply	Mainly purebred dogs and KC only by implication
Genetic diversity of most existing breeds is increased	Supply	Purebred dogs by implication

Table A2. Summary of Recommendations made in **Pedigree Dog breeding: A major welfare concern? Rooney and Sargan 2009**

Primary and Priority Recommendations from expert panel (page 39)	**Focus**	**Target Constituency**
Systematic collection of morbidity and mortality data from all registered dogs.	Supports both supply and demand	All dogs
Revision of registration rules to prevent the registration of the offspring of any mating between first-degree and second-degree relatives.	Supply	Pedigree dogs (KC only)
Open stud books to allow more frequent introduction of new genetic material into established breeds	Supply	Pedigree dogs (KC only)
Setting up systems to monitor the effectiveness of any intervention and changes in breeding standards.	Supply	By implication KC pedigree dogs only
Conducting a full ethical review of current breeds.	Supports both supply and demand.	Purebred dogs
Development of detailed management plans for each breed.	Supply mainly	Purebred dogs
Refinement of diagnostic tests and DNA markers for inherited disorders.	Supply	Pedigree dogs (KC only by implication)
Increase genetic diversity by encouraging importation and inter-country matings.	Supply	Purebred dogs
Make registration of pedigree dogs conditional upon both parents undergoing compulsory screening tests for prioritised disorders	Supply	Pedigree dog (KC only)
Introduction of codes of practice that encourage breeders to consider health, temperament and welfare.	Supply	All dogs
Training and accreditation of judges to prioritise health, welfare and behaviour in the show ring	Supply and possibly demand	Pedigree KC and show dogs only.
Creating and fostering the image of a happy and desirable dog being one that experiences high welfare.	Demand	All dogs
Formulation of an independent panel of experts from multiple disciplines. A committee that will facilitate dialogue and result in positive action by all stakeholders.	Supply and demand	All dogs
Development of schemes for calculating Estimated Breeding Values	Supply	Pedigree dogs (KC only by implication)

Table A3. Summary of recommendations made by **APGAW**.

Recommendations	Focus	Target Constituency
KC strongly advises all breeders to health test their dogs, where such tests are available.	Supply	KC pedigree dogs
KC makes information regarding health problems more visible on their website and highlights breeders who carry out health tests.	Supply and demand	KC pedigree dogs
Breed standards should seek conformation of dogs so that they are 'fit for purpose' rather than based on visual aesthetics.	Supply and demand	KC pedigree dogs
KC should state that no dog will be given the title of Champion unless it has been health screened for diseases known to be associated with that specific breed and proof of that is provided.	Supply	KC pedigree dogs
KC ensures top breeders and judges at championship shows look to see proof of dogs having passed health screening.	Supply	KC pedigree dogs
The issue of consumer rights is investigated as part of this problem and the impact on the public of low health and welfare standards in dog breeding is recognised by government.	Demand	ALL dogs
A puppy sale contract is an excellent means to tackle the issues raised head on. KC, BVA, RSPCA should work together to develop this.	Supply and demand	All dogs

Table A4. Summary of Recommendations made in **Bateson Inquiry** into Dog Breeding

Recommendations	Focus	Target Constituency
A non-statutory Advisory Council on Dog Breeding should be established	Supply	All dogs
The creation of a computer-based system for the collection of anonymised diagnoses from veterinary surgeries.	Impacts both supply and demand	All dogs
Revision of breed standards	Supply	Pedigree dogs (KC only)
ABS becomes UKAS accredited	Supply	KC dogs only (ABS only)
RCVS and BVA should lead shift towards preventative veterinary medicine	Supply and demand	All dogs
Inspection of breeder premises should address all issues contained in AWA 2006	Supply	Dogs bred by Licensed breeders only
All puppies should be microchipped	Supply	All dogs
Secondary legislation added to the AWA 2006	Supply	All dogs
Defra to introduce Code of Practice on the Breeding of Dogs	Supply	All dogs
BVA should compile a list of vets willing to support the inspection process.	Supply	Licensed breeders only
Public awareness and education campaign should be designed to encourage better buying decisions	Demand	All dogs
When ABS is auditable through robust process buying public should be signposted to it.	Supply and demand	ABS breeders only