



THE KENNEL CLUB
DOG HEALTH

Breed Health and Conservation Plan

English Toy Terrier Evidence Base

CONTENTS

INTRODUCTION.....	3
DEMOGRAPHICS	3
BREED HEALTH CO-ORDINATOR ANNUAL HEALTH REPORT	4
BREED CLUB HEALTH ACTIVITIES.....	5
BREED SPECIFIC HEALTH SURVEYS	5
LITERATURE REVIEW	8
BREED WATCH	8
PERMISSION TO SHOW	8
ASSURED BREEDER SCHEME	9
BREED CLUB BREEDING RECOMMENDATIONS	9
DNA TEST RESULTS.....	9
CANINE HEALTH SCHEMES.....	9
REPORTED CAESAREAN SECTIONS	10
GENETIC DIVERSITY MEASURES.....	11
CURRENT RESEARCH	13
PRIORITIES.....	14
ACTION PLAN	14
REFERENCES.....	15

INTRODUCTION

The Kennel Club launched a new resource for breed clubs and individual breeders – the Breed Health and Conservation Plans (BHCP) project – in September 2016. The purpose of the project is to ensure that all health concerns for a breed are identified through evidence-based criteria, and that breeders are provided with useful information and resources to raise awareness of current health and welfare concerns in their breed, and support them in making balanced breeding decisions.

The Breed Health and Conservation Plans take a complete view of breed health with consideration to the following issues: known inherited conditions, complex conditions (i.e. those involving many genes and environmental effects such as nutrition or exercise levels, for example hip dysplasia), conformational concerns and population genetics.

Sources of evidence and data have been collated into an evidence base which gives clear indications of the most significant health conditions in each breed, in terms of prevalence and impact. Once the evidence base document has been produced it is discussed with the relevant Breed Health Co-ordinator and breed health representatives where applicable. Priorities are agreed based on this data and incorporated into a list of actions between the Kennel Club and the breed to tackle these health concerns. These actions are then monitored and reviewed on a regular basis.

DEMOGRAPHICS

The number of English Toy Terriers registered by year of birth between 1980 and 2019 are shown in Figure 1. The breed is classed as a vulnerable native breed by the Kennel Club, with fewer than 300 dogs registered per year.

The 1980 registrations figure appears depressed for all breeds due to registrations moving across to the electronic system from paper files.

The trend of registrations over year of birth (1980-2019) was +2.28 per year (with a 95% confidence interval of +1.77 to +2.79), reflecting the overall rise in the breed's numbers during this time. However, no more than 140 dogs have been registered in a single year.

[Put simply, 95% confidence intervals (C.I.s) indicate that we are 95% confident that the true estimate of a parameter lies between the lower and upper number stated.]

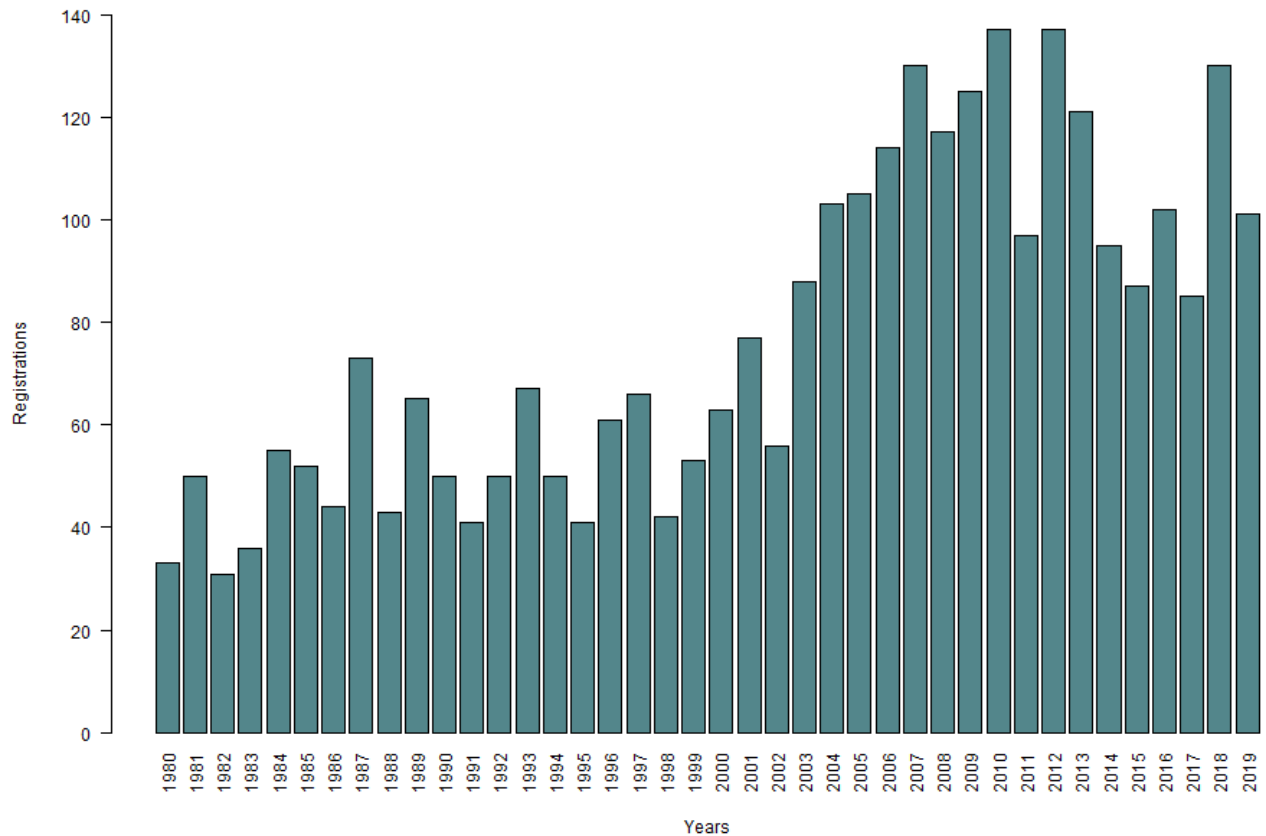


Figure 1: Number of English Toy Terrier registrations per year of birth, 1980 – 2019.

BREED HEALTH CO-ORDINATOR ANNUAL HEALTH REPORT

Breed Health Co-ordinators (BHCs) are volunteers nominated by their breed to act as a vital conduit between the Kennel Club and the breed clubs with all matters relating to health.

The BHC's Annual Health Report 2019, yielded the following response to 'please list and rank the three health and welfare conditions that the breed considers to be currently the most important to deal with in your breed':

1. Patellar luxation
2. Dentition

In terms of what the breed has done in the last year to help tackle these listed health and welfare concerns, the breed has continued to encourage breeders to select patellar tested dogs with low scores to breed from.

BREED CLUB HEALTH ACTIVITIES

The English Toy Terrier has an active Breed Health Coordinator (BHC) and a webpage dedicated health, which can be found at: <https://www.english-toy-terrier-club.com/about-the-breed/health-and-welfare/>

BREED SPECIFIC HEALTH SURVEYS

Kennel Club Purebred and Pedigree Dog Health Surveys Results

The Kennel Club Purebred and Pedigree Dog Health Surveys were launched in 2004 and 2014 respectively for all of the recognised breeds at the time, to establish common breed-specific and breed-wide conditions.

2004 Morbidity results: Health information was collected for 92 live English Toy Terriers of which 67 (73%) were healthy and 25 (27%) had at least one reported health condition. The top categories of diagnosis were musculoskeletal (30.0%, 12 of 40 reported conditions), reproductive (22.5%, 9 of 40 reported conditions), ocular (12.5%, 5 of 40 reported conditions), dermatologic (10.0%, 4 of 40 reported conditions), and cancer (7.5%, 3 of 40 reported conditions). The most frequently reported specific conditions were patellar luxation (7 reports), pyometra (4 reports), blindness (3 reports), demodectic mange (2 reports), and forelimb fracture (2 reports).

2004 Mortality results: A total of 19 deaths were reported for the English Toy Terrier. The median age at death was 12 years (min = 1 year and 5 months, max = 15 years and 11 months). The most frequently reported causes of death by organ system or category were old age (31.6%, 6 of 19), cancer (15.8%, 3 of 19), cardiac (10.5%, 2 of 19), endocrine (10.5%, 2 of 19), and behaviour (5.3%, 1 of 19).

2014 Morbidity results: Health information was collected for 39 live English Toy Terriers of which 27 (69.2%) had no reported conditions and 12 (30.8%) were reported to be affected by at least one condition. There were four most commonly reported disease conditions that represented an equal proportion of the live dogs; these were anal gland/sac impaction/blockage, demodex infestation, otitis media and patellar luxation/slipping kneecap.

2014 Mortality results: There were no reported deaths for the English Toy Terrier.

2018 Canadian Manchester Terrier Club Health Survey

A survey was launched by the Canadian Manchester Terrier Club and received responses from several varieties: the Standard Manchester Terrier, Manchester Terrier, English Toy Terrier and Toy Manchester Terrier. Results below are specific to the English Toy Terrier, with a full report available from: <http://www.canadamt.com/ghs-2018.html>

For the English Toy Terrier a total of 229 responses were received, with 43% of the responses from the UK, 21% from Norway, 15% Australia, 9% Finland, 3% Spain and 3% Sweden. The median age of dogs included in the survey was 5 years.

Cancer/ Tumour

A total of eight English Toy Terriers were reported to have been affected with cancer, with the most common being mammary cancer (0.9%, n=2), mast cell tumours (0.9%) and one each for adenocarcinoma, lymphoma, liver cancer and oral papillomatosis. Of the six dogs living with cancer, all were over the age of six. The two deceased dogs died at age nine and ten.

Cardiovascular

The most common heart condition reported were heart murmurs (n=9, 3.9%), followed by one case of each of the following: arrhythmia, atrial septal defect, congestive heart failure, mitral valve disease, and valve dysfunction. Four dogs died due to their heart condition.

Dental

The most common condition under this section was removal of teeth due to gingivitis, gum disease, or poor oral health, which was reported in 17.5% (n=40) of English Toy Terriers. There were also eight cases of dental abscess (3.5%), 11 underbites (4.8%), four overbites (1.8%), three removal of teeth not due to poor health (e.g. trauma/ retained puppy teeth), and one case of oral papillomatosis, and masticatory muscle atrophy.

Ears/ Hearing

Deafness related to advanced age was noted in five dogs (2.2%), 21% of English Toy Terriers over the age of 11. Similarly, there were two cases of chronic ear infections (0.9%), and one case of bilateral deafness.

Endocrinology

Two dogs were reported to be affected by Cushing's disease (0.9%), followed by one case each for diabetes mellitus and hypothyroidism.

Eyes

The most common eye condition affecting English Toy Terriers were cataracts, seen in 7.4% of dogs (n=17), followed by "eye/ sight changes related to advanced age" in 3.1% of dogs. There were also two cases of night blindness, and one each for conjunctivitis, distichiasis, keratoconjunctivitis sicca (dry eye), episcleritis (inflammation of episclera tissue), anisocoria (unequally sized pupils), iris atrophy, trauma induced enucleation (eye removal) and vitreous degeneration.

Gastrointestinal

The most common condition affecting the breed for this category was impacted anal glands, affecting 15 dogs (6.6%). This was followed by six cases of bilious vomiting syndrome (2.6%) and colitis (2.6%), coprophagia (2.2%, n=5), four cases of chronic

diarrhoea (1.8%), haemorrhagic gastroenteritis (1.8%), and irritable bowel disease (1.8%), two cases of pancreatitis, and one each (0.4%) for bloat/ torsion, pica, peritonitis, protein-losing enteropathy, susceptibility to digestive tract infections, hernia, occasional diarrhoea, episodes of vomiting bile, episodes of vomiting blood and inability to build body condition. The study found the breed were twice as likely to report colitis and haemorrhagic gastroenteritis respectively, compared to the other breeds included.

Liver/ Pancreas

Two cases of pancreatitis was reported in the breed, representing 0.9% of dogs, as well as one case of cirrhosis/ fibrosis and liver cancer, respectively.

Neurological

A total of six cases of seizures (2.6%) and three epilepsy (1.3%) were reported for the breed. There was a further one case reported for a possible herniated disc, spinal injury, and spondylosis.

Musculoskeletal

Eighteen cases of patellar luxation were reported in the breed (7.9%), followed by five cases of arthritis (2.2%) and one each for cruciate ligament tear/ rupture, legg-calve-perthes disease, poor muscle co-ordination, and “intermittent skip in back leg” with no known cause.

Reproductive

A total of 15 cases (6.6%) of false pregnancy were reported in the breed, followed by five cases of pyometra, two cases of spontaneous abortion and monorchidism respectively, and one case each of cryptorchidism, female infertility, male infertility and mastitis.

Respiratory

Two dogs were reported to having been affected by a breathing condition, with these being bronchitis and kennel cough respectively.

Urinary

There were just two cases each for incontinence and prostate infection in the breed (0.9%), and one case each for cysteine bladder stones, struvite stones and acute kidney failure.

Mortality Data

Of the 229 English Toy Terriers, 11% were reportedly deceased, with an average age of 11 years and median age of 12 years. The majority of deaths (52%) were reported in dogs over the age of 11. The most commonly reported causes of death were old age (n=8), accident/ trauma (n=3) and then one for each of the following: lymphoma, liver cancer, heart murmur, valve dysfunction, acute kidney failure, masticatory muscle atrophy, Cushing’s disease, epileptic seizure, gastrointestinal – unspecified, hereditary cataract, pancreatitis and stroke.

LITERATURE REVIEW

The literature review lays out the current scientific knowledge relating to the health of the breed. We have attempted to refer primarily to research which has been published in peer-reviewed scientific journals. We have also incorporated literature that was released relatively recently to try to reflect current publications and research relating to the breed. No papers could be found specific to English Toy Terriers, however given that the breed are classed as Toy Manchester Terriers in America, and these dogs quite often appear historically in the pedigrees of English Toy Terriers, papers relating to this breed have been included.

Cardiac Conditions

Juvenile Dilated cardiomyopathy (JDCM): Cases of 14 Toy Manchester Terriers affected by DCM were identified and analysed by researchers in the USA to assess the progression and aetiology of this condition in the breed (Legge et al, 2013). The range in age of affected dogs was 10 to 58.3 weeks, with both females and males being equally affected and 10 of the dogs dying suddenly. The authors suggested that due to the condition's specific phenotype there maybe a genetic component contributing to this disease in the breed, however they could not definitively rule out a pathological component. Subsequently to this a DNA test has been released, with the proposed mutation having an autosomal recessive mode of inheritance, however the mutation responsible has not been published.

Ocular Conditions

Primary cataracts: A study of all dogs affected by cataracts presented to veterinary hospitals in North America investigated the prevalence of this condition in several breeds, including the Toy Manchester Terrier (Gelatt and MacKay, 2005). The breed had a prevalence of 3.81% (23/ 603 dogs), and was most commonly affected the ages of seven and 10 years (9.71%).

BREED WATCH

The English Toy Terrier is a category one breed, meaning judges are not required to complete mandatory monitoring forms following an appointment as championship certificate level. To date no optional reports have been received for the breed.

PERMISSION TO SHOW

As of the 1st January 2020 exhibits for which permission to show (PTS) following surgical intervention has been requested will no longer be published in the Breed Record Supplement and instead will be detailed in BHCPs, and a yearly report will be collated for the BHC. In the past five years, two PTS have been granted for the English Toy Terrier (not including neutering or caesarean section), with these being for 'an operation to repair a fractured leg' and 'other fractures'.

ASSURED BREEDER SCHEME

There are currently no requirements for breeders of the English Toy Terrier within the Kennel Club (KC)'s Assured Breeder Scheme, however it is currently recommended all breeding stock are tested for the following prior to breeding:

- Breed club – patella luxation

BREED CLUB BREEDING RECOMMENDATIONS

The Kennel Club include a breed club breeding recommendation which is detailed under the Assured Breeder Scheme sub-heading above.

DNA TEST RESULTS

There are currently no recognised DNA tests for the English Toy Terrier.

Whilst other DNA tests may be available for the breed, results from these will not be accepted by the Kennel Club until the test has been formally recognised, the process of which involves collaboration between the breed clubs and the Kennel Club in order to validate the test's accuracy.

Laboratories that test for these DNA tests and the methods through which the Kennel Club accept results can be found through:

<https://www.thekennelclub.org.uk/worldwide-dna-tests/>

CANINE HEALTH SCHEMES

All of the British Veterinary Association (BVA)/Kennel Club (KC) Canine Health Schemes are open to dogs of any breed with a summary given of dogs tested to date below.

EYES

The breed is not currently on the BVA/KC/ISDS Known Inherited Ocular Disease (KIOD) list (formally Schedule A) or Schedule B for any condition under the BVA/KC/International Sheep Dog Society (ISDS) Eye Scheme.

KIOD lists the known inherited eye conditions in the breeds where there is enough scientific information to show that the condition is inherited in the breed, often including the actual mode of inheritance and in some cases even a DNA test.

Schedule B lists those breeds in which the conditions are, at this stage, only suspected of being inherited. As well as the Schedule A and B, the BVA records any other conditions affecting a dog at the time of examination, which is incorporated into an annual sightings report (table 1).

Table 1: BVA/KC/ISDS annual sightings reports for the English Toy Terrier.

Year	Number Tested	Comments
2012	10 adults 0 litters	5 – persistent pupillary membranes (PPM)
2013	14 adults 0 litters	2 – PLC opacities
2014	10 adults 0 litters	3 – persistent pupillary membranes (PPM) 3 – persistent hyperplastic primary vitreous (PHPV)
2015	19 adults 0 litters	1 – distichiasis 3 – persistent hyperplastic primary vitreous (PHPV)
2016	8 adults 0 litters	No comments
2017	5 adults 0 litters	No comments
2018	5 adults 1 litter	No comments
2019	<i>Awaiting report</i>	

REPORTED CAESAREAN SECTIONS

When breeders register a litter of puppies, they are asked to indicate whether the litter was delivered (in whole or in part) by caesarean section. In addition, veterinary surgeons are asked to report caesarean sections they perform on Kennel Club registered bitches. The consent of the Kennel Club registered dog owner releases the veterinary surgeon from the professional obligation to maintain confidentiality (vide the Kennel Club General Code of Ethics (2)).

There are some caveats to the associated data;

- It is doubtful that all caesarean sections are reported, so the number reported each year may not represent the true proportion of caesarean sections undertaken in each breed.
- These data do not indicate whether the caesarean sections were emergency or elective.
- In all breeds, there was an increase in the number of caesarean sections reported from 2012 onwards, as the Kennel Club publicised the procedure to vets.

The number of litters registered per year for the breed and the number and percentage of reported caesarean sections in the breed for the past 10 years are shown in Table 2.

Table 2: Number of English Toy Terrier litters registered per year and number and percentage of caesarean sections reported per year, 2009 to 2019.

Year	Number of Litters Registered	Number of C-sections	Percentage of C-sections	Percentage of C-sections out of all KC registered litters (all breeds)
2009	35	0	0.00%	0.15%
2010	37	0	0.00%	0.35%
2011	28	0	0.00%	1.64%
2012	35	2	5.71%	8.69%
2013	37	0	0.00%	9.96%
2014	27	2	7.41%	10.63%
2015	24	3	12.50%	11.68%
2016	30	3	10.00%	13.89%
2017	26	1	3.85%	15.00%
2018	27	0	0.00%	17.21%
2019	33	1	3.03%	15.70%

GENETIC DIVERSITY MEASURES

The effective population size is the number of breeding animals in an idealised, hypothetical population that would be expected to show the same rate of loss of genetic diversity (rate of inbreeding) as the population in question; it can be thought of as the size of the 'gene pool' of the breed. In the population analysis undertaken by the Kennel Club in 2020, an estimated effective population size of **N/A** was reported (estimated using the rate of inbreeding over the period 1980-2020). This implies a restoration in genetic diversity during this period, however given the small population for the breed there will be a wide degree of fluctuation, which could contribute to this value.

Annual mean observed inbreeding coefficient (showing loss of genetic diversity) and mean expected inbreeding coefficient (from simulated 'random mating') over the period 1980-2020 are shown in Figure 2. The observed inbreeding gradually increased between 1980 and 2000, but has since begun to decrease, implying a restoration of genetic material in the breed.

It should be noted that, while animals imported from overseas may appear completely unrelated, this is not always the case. Often the pedigree available to the Kennel Club is limited in the number of generations, hampering the ability to detect true, albeit distant, relationships. For full interpretation see Lewis et al, 2015

<https://cgejournal.biomedcentral.com/articles/10.1186/s40575-015-0027-4>

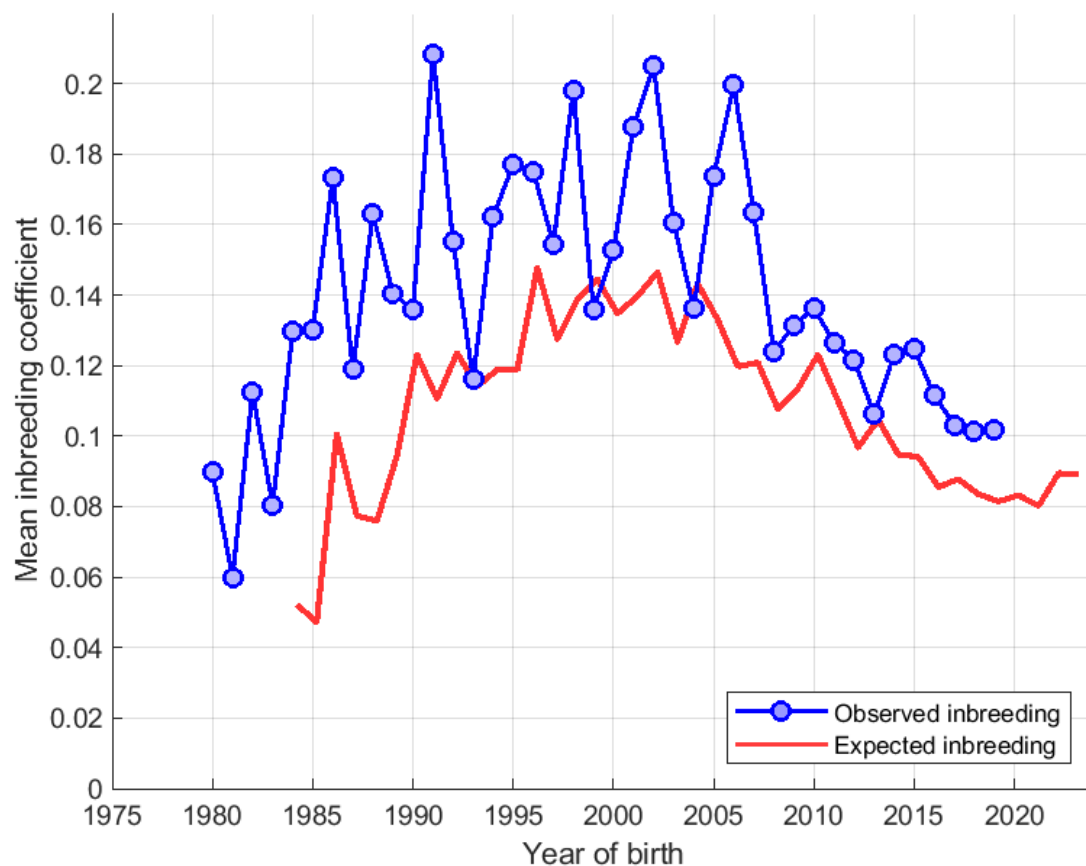


Figure 2: Annual mean observed and expected inbreeding coefficients.

Below is a histogram ('tally' distribution) of number of progeny per sire and dam over each of seven 5-year blocks (Figure 3). A longer 'tail' on the distribution of progeny per sire is indicative of 'popular sires' (few sires with a very large number of offspring, known to be a major contributor to a high rate of inbreeding).

The use of popular sires in the breed is consistently high, and although this has reduced slightly during the past five years, there has still been one sire responsible for 8.4% of progeny registered during this time. Prolonged use of popular sires, and their immediate relatives, can have rapid impacts on genetic diversity and so should be considered carefully when breeding.

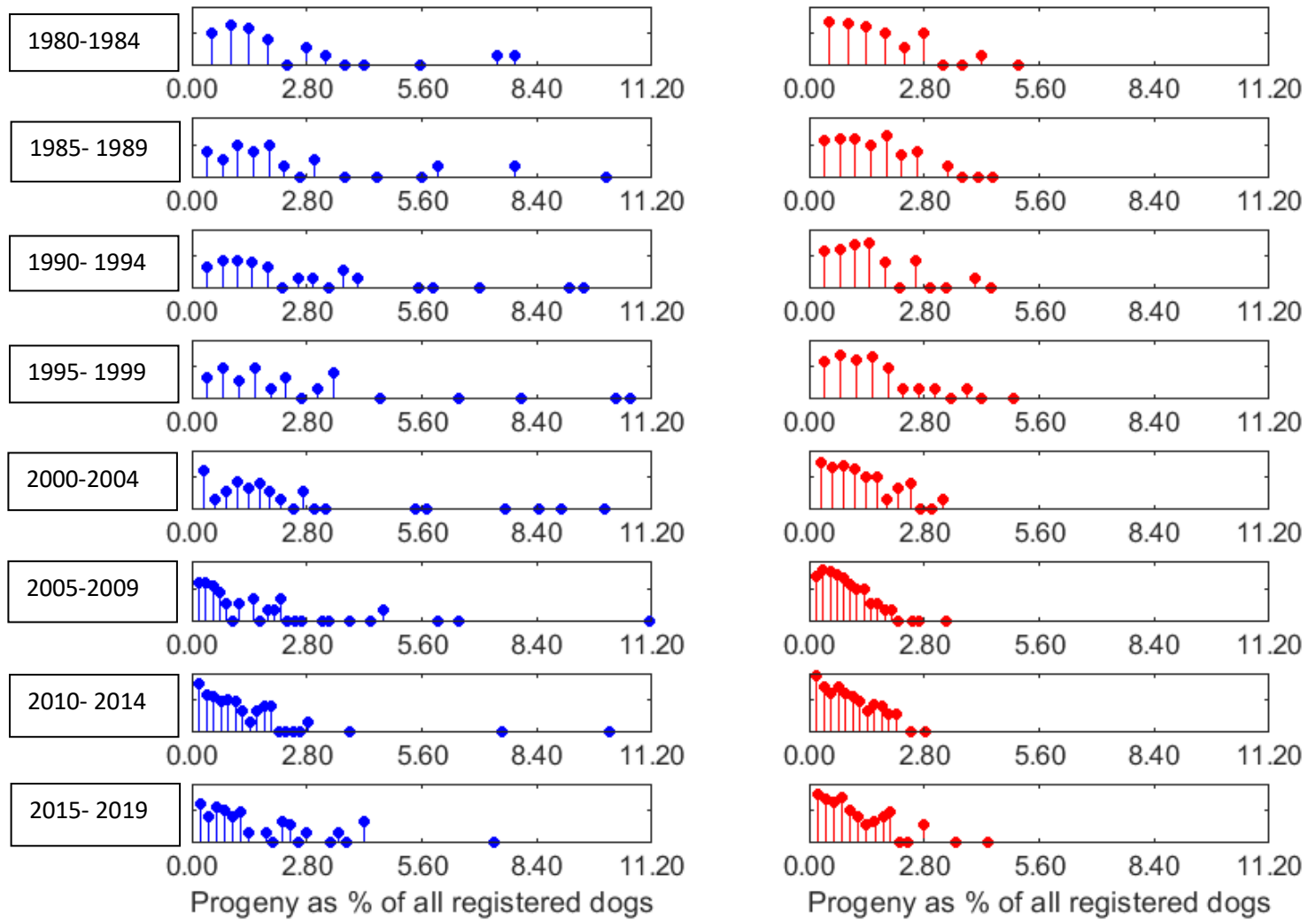


Figure 3: Distribution of the number of progeny per sire (blue) and per dam (red) over 5-year blocks (1980-4 top, 2010-14 bottom). Vertical axis is a logarithmic scale

CURRENT RESEARCH

The breed are not currently involved in any research projects at this time.

PRIORITIES

Correspondence between the breed representatives and the Kennel Club was undertaken in Jan 2021 to discuss the evidence base of the BHCP and agree the priority issues for the health of the breed. The group agreed from the evidence base that the priorities for the English Toy Terrier were:

- Patellar luxation
- Dentition

ACTION PLAN

Following the correspondence between the Kennel Club and the breed regarding the evidence base of the Breed Health & Conservation Plans, the following actions were agreed to improve the health of the English Toy Terrier. Both partners are expected to begin to action these points prior to the next review.

Breed Club actions include:

- The Breed Club to incorporate dental care advice on their club website.
- The Breed Club to continue to encourage patellar testing, and collate results of dogs tested under this.

Kennel Club actions include:

- The Kennel Club to report back on the feasibility of developing a patellar luxation scheme.
- The Kennel Club to develop a piece on the use of popular sires, specific to numerically small breeds, to highlight the risks of prolonged use of such dogs.
- The Kennel Club to raise awareness of the breed on its social media platforms.

REFERENCES

Gelatt, K.N., MacKay, E.O. (2005) Prevalence of primary breed-related cataracts in the dog in North America. *Veterinary Ophthalmology* **8(2)**: 101-111

Legge, C.H., Lopez, A., Hanna, P., Cote, E., Hare, E., Martinson, S.A. (2013) Histological characterisation of dilated cardiomyopathy in the juvenile Toy Manchester Terrier. *Veterinary Pathology* **50(6)**: 1043-1052