Demographic changes in UK Rescue Centre dog population between 2014 and 2018

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Abstract

Rescue centers remain a common means of rehoming a dog. There is a paucity of research into the composition of rescue center populations and its potential reflection of increased popularity of brachycephalic breeds. The study investigated changes in rescue center demographics from 2015 to 2018, compared to the wider dog population. Dogs on 16 rehoming centers' websites were recorded weekly from June 2015 for 8 weeks and replicated
from June 2018. Data were collected on 1793 dogs across the centers. Over 50% of which were classified as purebred in both years. Over 80% of the dogs were categorized into 24 breeds or breed crosses. Dogs categorized as brachycephalic increased from 24 (2.76%) in 2015 to 48 (5.19%) in 2018. Subadult dogs (3–4 years) were most prevalent in both years. While sex, breed type, and age of the rehoming center population has remained relatively stable, breeds are changing. Whilst low, brachycephalic numbers doubled in 3 years, mirroring their rising popularity within the UK, impacting on rehoming centers and prospective new owners with additional costs of brachycephalic obstructive airway syndrome surgery.

Introduction

Around 130,000 dogs are estimated to enter UK welfare organisations such as re-homing centres each year (Clark et al., 2012; Casey 2019), equating to approximately 1% of the estimated 9 million dogs living in the UK being relinquished annually (Pet Food Manufacturers Association 2019). Although these summative headline figures describe the overall numbers entering the care of welfare organisations, they fail to describe the demographic changes in the re-homed population. Differing breeds require often highly contrasting intensities of care, housing and particularly veterinary care.

The cost of housing, feeding and providing veterinary care to these relinquished dogs falls to the rehoming organisations, with the RSPCA spending almost £50 million on maintaining their hospitals and animal rehoming centres in 2018 (RSPCA 2018). Welfare organisations face serious economic challenges in the near future. The cost of feeding and caring for these animals is predicted to increase as prices rise following Brexit, the number of dogs being relinquished typically increases during economic recession (The Guardian 2011). As the popularity of designer, typically brachycephalic, dog breeds grows (Packer et al 2020), there is a risk rehoming charities may face the additional financial burden of caring for these dogs, known to have a disproportionate likelihood of inherent and chronic health issues, which require costly surgical intervention and lengthy recuperation (O'Neill 2017). Welfare and veterinary organisations have issued warnings to potential dog owners of the welfare problems faced by many brachycephalic breeds (British Veterinary Association 2019), yet the number of puppies sold continues to rise. Assessment of the demographic data could highlight whether these breeds are starting to present to rehoming organisations.

The Dogs Trust and the Royal Society for the Prevention of Cruelty to Animals (RSPCA) are two of the largest rehoming charities in the UK with many centres throughout England and Wales, with the Scottish Society for the Prevention of Cruelty to Animals (SSPCA) centres located in Scotland. The 20 Dogs Trust centres take in over 15,000 dogs a year from local authority pounds, other charities and handovers from the public across its 20 centres (Dogs Trust 2019). The RSPCA took in over 102,900 animals in 2018 (all species) across 17 regional animal centres whilst the SSPCA rehomed 5068 (all species) in 2018. The majority of dogs at the RSPCA centres are either rescued by inspectors or are taken in as strays (RSPCA 2019; SSPCA 2018).

Size of dog, high training costs, change of circumstances and particularly health problems have also been cited as reasons for relinquishment (Diesel et al 2008; Lambert et al 2015). The

brachycephalic French Bulldog is currently the UK's most popular breed, registrations have increased from 1521 in 2009 to 36,785 in 2018, replacing the Labrador Retriever as the most popular purebred since the 1990s (The Kennel Club 2019). Whilst the KC registration of some individual brachycephalic breeds has decreased (The Kennel Club 2018), the overall proportion of brachycephalic individuals born into the population tripled from 5% in 2004 to 15% in 2016 (based on veterinary record registrations) (Kernot 2017). Although KC registration is thought to only account for 30% of the UK dog population (The Kennel Club 2018), registrations are likely to reflect the changing trend in popularity of particular breeds in the UK.

New owners principally choose brachycephalic breeds due to appearance, such as neoteny, rather than breed health (Packer et al 2017) despite the disproportionate likelihood of inherent and chronic health issues, which require costly surgical intervention and lengthy recuperation, when compared to non-brachycephalic breeds (O'Neill et al 2017). These include, but are not limited to, Brachycephalic Obstructive Airway Syndrome (BOAS) (Packer et al 2015a) and corneal ulceration (Packer et al 2015b). If an increase in brachycephalic breeds occurs in rescue centres, it may place additional strain on resources due to cost of treatment and additional length of stay for post-operative recovery. Since relinquishment by owners due to unpredicted ill-health is probable, prospective adopters should be offered education and support in terms of the potential health issues and associated costs of adopting a brachycephalic breed.

Rehoming organisation websites are commonly used as a means of providing information to the public on details of dogs available for rehoming. This information generally includes breed, age, sex and a photograph, in addition to rehoming centre location which have been explored in terms of rehoming success (Diesel et al 2008; Lepper et al 2002; Siettou et al 2014). More recent research has highlighted the impact of descriptive terms used to describe the dog on length of stay (Nakamura et al 2019). Whilst information on individual dogs available for

rehoming is publicly available on rehoming centre websites; as the wider dog population is changing, there is a paucity of research into how this is reflected in the composition of the rescue centre population in terms of age, sex and, crucially, breed availability and its potential to reflect the rise in popularity of brachycephalic breeds.

By understanding the changing demographic of the rehoming centre population, it will be possible to determine its stability and how it compares to the current pet population. This is an important area of research in order to determine whether the rehoming centre population is changing to reflect that of the pet population.

The aim of the study was to investigate any changes in rescue centre demographics from 2015 to 2018 and compare these with known changes in the wider dog population. Factors such as breed, breed type, age and sex of dogs were explored, in addition to the interaction with common breeds and age group.

Materials and Methods

Study Subjects

Eight RSPCA/SSPCA centres and eight Dogs Trust centres were selected. The centres were located in the North West, Scotland, North East, South West, South East, South Central and Greater London. The focus was placed on larger centres that regularly updated website information (on at least a weekly basis) on dogs available and had a consistent throughput of dogs, minimising the likelihood of dogs being rehomed prior to being added onto the website. In some instances, dogs were added to the website as being already 'reserved' or rehomed before a photograph had been added. These dogs were still counted in the data collection.

Data Collection

Dogs that had been placed on the website for each rehoming centre were recorded weekly from 1st June 2015 for eight weeks and this data collection process replicated from 1st June 2018 to provide a suitable indicator of the rescue centre population. Where dogs remained on the website over the data collection period, they were only recorded once. Data were collected on 1793 dogs across the 16 UK centres.

Details were recorded from websites including: suggested breed; suggested age; sex and rehoming centre. Since age is often reported within an age bracket it was categorised as puppy (0–12 months old), juvenile (1–2 years old), sub adult (3–4 years old), adult (5–7 years old), or geriatric dog (8 or more years old) (in line with Siettou et al 2014). Additional categories were created using the initial information collected; breed type: purebred, crossbreed (where a specific breed or cross of two breeds is given (e.g. Labrador cross or Border Collie cross Springer Spaniel)), and mixed breed (where multiple breeds or general 'crossbreed' is suggested).

Data Analysis

Analysis was conducted using Minitab and SPSS (version 24). Significance values were set as p=0.05 unless otherwise stated. A Chi squared test was used to assess the potential association between 2015 and 2018 for sex, age category and breed type (pure, cross, mixed). Descriptive statistics were used to evaluate specific breeds and breed crosses.

Goodness of fit tests were used to determine differences between age classes and among breed types and between sexes.

The association between breed and age category were analysed for dogs that represented more than 2% of the population in either 2015 or 2018 (to give sufficient numbers per category to analyse), using a Chi squared test. Brachycephalic breeds were considered as a single 'breed'

for the purposes of this analysis due to their low overall numbers. Differences were analysed using a Bonferroni adjusted post hoc test. Adjusted significance values were set as p=0.0008. The study was approved by the Nottingham Trent University's School of Animal, Rural and Environmental Science's Ethics Committee (ARE618).

Results

Breed

Overall, in the 8-week period of monitoring, 868 dogs were counted across the 16 rescue centres in 2015, and 925 in 2018. A total of 120 breeds and breed crosses were categorised. Of all dogs in 2015 and 2018 respectively 83% (n = 719) and 82% (n = 757) were categorised in 24 common breeds, or breed crosses (as used by the centres) across all centres (Table 1).

Table 1 about here

Brachycephalic breeds

The number of dogs categorised as brachycephalic increased from 24 (2.76%) in 2015 to 48 (5.19%) in 2018. The definition of brachycephalic was taken from those breeds and their crosses stated as 'extreme brachycephalic' by the Kennel Club (The Kennel Club n.d.). The brachycephalic breeds that occurred in the rescue centres were: Bulldog (British/English); bulldog cross; cavalier King Charles Spaniel; Lhasa Apso; Pug; Shih Tzu and French Bulldog (Table 2). Boston Terrier, Pekingese, Affenpincher and Griffon brusellois are classified as

brachycephalic but did not appear in population sampled. Those classified as 'less exaggerated' brachycephalic (Boxer and Staffordshire Bull Terrier) were not included, since it was considered that extreme brachycephalic crosses are more likely to suffer from health conditions such as BOAS, whilst less extreme brachycephalic breeds were less likely (Packer et al., 2015a).

Table 2 about here

Breed type

Overall, 52% (n = 451) of dogs in centres were classified as purebred in 2015 and 56% (n = 522) in 2018, 33% (n = 288) and 27% (n = 252) labelled cross breed in 2015 and 2018 respectively and 15% (n = 129) and 16% (n = 151) mixed breed in 2015 and 2018 respectively. Breed type had a significant association with year (χ^2 = 7.505, df = 2, p<0.05) crossbreed having the biggest contribution to this difference, followed by pure breed (Figure 1).

Figure 1 about here

Age

Overall, sub adult dogs (3-4 years) made up the largest percentage of dogs in both 2015 (29.8%, n = 259), and 2018 (32.2%, n = 298) followed by adult (5-7 years) (22.6%, n = 196; 21.7%, n = 201; 2015 and 2018 respectively) and juveniles (1-2 years) (18.3%, n = 159; 19.7, n = 182; 2015 and 2018 respectively) and geriatric dogs (>8 years) (14.7%, n = 128; 14.7%, n = 136;

2015 and 2018 respectively) and puppies (<1 year) (13.7%, n = 119; 11.6%, n = 107), no age was given for 7 dogs in 2015 and 1 dog in 2018 (Figure 2).

The chi squared analysis showed no effect of year on age class (χ^2 = 7.921, df = 5, ns). Overall comparisons between age categories, with goodness of fit set at 20% showed a higher than expected number of dogs in the young adult category and a lower number than expected in the 0-1 and 8+ age categories (χ^2 = 189.54, df = 4, p < 0.0001).

Figure 2 about here

Sex

Sex had no significant association with year (χ^2= 2.024, df = 1, ns). Female dogs did, however, make up a smaller percentage of dogs in rehoming centres (40%, n = 674) (χ^2 = 81.81, df = 1, p < 0.0001). This was reflected in both years (41% female (n = 356) in 2015, 38% female (n = 349) in 2018).

Association between breed and age

For breeds representing more than 2% of the rehoming population data collected in any one year, there was an association between age and breed for 2015 (χ^2= 65.923, df = 48, p < 0.0001) and 2018 (χ^2= 128.813, df = 48, p < 0.0001) and both years combined (χ^2= 134.556, df = 48, p < 0.0001). Higher than expected numbers of Mixed breed dogs were observed in the puppy age category in 2018 and the population overall (Z=4.1, p < 0.0001 and Z=4.6, p < 0.0001 respectively). Higher numbers of Greyhounds were observed in the sub-adult years age

category. Higher numbers of Jack Russell Terriers (Z=3.7, p< 0.0001) were observed and lower numbers of Lurchers (Z=-4.0, p< 0.0001) in the geriatric age category in all years. Higher numbers of Staffordshire Bull Terriers were observed in the geriatric age category in 2018 (Z=3.4, p< 0.0001). All other associations between age category and breed were not significant.

Discussion

The findings highlight that, whilst the year had no impact on the age and sex distribution, there was a difference in the demographic of the population of dogs advertised in terms of breed and breed type, although mixed breed, Staffordshire Bull Terrier and Lurchers remaining the most common breeds as classified by the rescue centres. Whilst the number of brachycephalic breeds and their crosses remain relatively low overall, the numbers have doubled from 2.67% to 5.38% in 3 years, potentially mirroring a rise in popularity within the population overall. This increase was particularly notable in the Pug, French Bulldog, Bulldog (English) and Lhasa Apso.

The increasing number of brachycephalic breeds suggests that their rising popularity is already influencing the demographic spread in rescue centres, a pattern that is likely to continue. As these dogs reach 3-4 years old, the most common age of relinquishment in this study, and others (Wells et al 2000). Owners are choosing brachycephalic breeds based on appearance with limited consideration of health conditions (Packer et al 2017). Other major UK rescue centres have already reported an increase in brachycephalic breeds being relinquished from 2014 to 2018, leading to a high number of dogs requiring BOAS surgery (Kernot 2017).

In 2012, the proportion of UK purebred dogs was highlighted as being 75.3% (Siettou et al 2014). This was not reflected in our rehoming centre population data (2015 (52%); 2018 (56%)), potentially due to higher cost of purchase and therefore longer decision-making process to find the most suitable breed, reducing the likelihood of relinquishment. Turcsán et al (2017) suggested that purebred dogs are considered calmer and more trainable, likely also

reducing relinquishment compared to mixed breeds and crossbreeds. Within the rehoming centre environment, purebred dogs are likely to be rehomed more quickly than crossbreed and mixed breed dogs (Diesel et al 2007; Posage et al 1998). This may mean that more effort is needed to increase the appeal of mixed breed dogs.

In addition to the desirability of breed types, breeds themselves show differing levels of desirability. The most common UK pedigree breed in 2018, according to Kennel Club registrations, was the French Bulldog (3,785), with Labrador Retriever second (36,526). Staffordshire Bull Terriers were 12th most popular (4858) (The Kennel Club, 2019). However, this does not take into consideration non-Kennel Club registered dogs, or mixed breeds and unknown breeds which account for a substantial percentage of the population according to microchip registrations (4.92% and 23.37% respectively) (et al 2011). These figures do not directly correlate to the rehoming centre population, although the popular breeds and their crosses are well represented in rehoming centre populations Labrador Retriever (1.5% and 1.4% 2015 and 2018 respectively) and Staffordshire Bull Terrier (9.0% and 9.8% 2015 and 2018 respectively). For non-pedigree dogs or dogs of unknown parentage upon relinquishment, breed is generally determined by rehoming centre staff but there is a poor level of agreement between breed suggested for the same dog (Olson et al 2015; Voith et al 2009). Bennett et al (2009) suggested that breed characteristics, such as excitability, are based more on preconceived ideas of breed characteristic rather than actual attributes. The breeding beyond the obvious morphological characteristics may in fact mask breed associated behavioural traits and lead to further relinquishment (Bennett et al. 2009). The breed allocated to a dog within a rehoming centre can influence how the dog is perceived by potential homes and centre staff (Simpson et al 2012). Currently organisations like the Dogs Trust use a dog's name, breed and location as their headline to attract potential adopters. Arguably, other factors should be

prioritised, such as temperament, behaviour and size over breed as these are more likely to affect rehoming success and return rates (Bennett et al 2009; Bradley 2011).

Juvenile dogs and puppies (<1 to 2 years) constituted approximately 30% of the rehoming population in both time periods. This suggests that young dogs comprise a large proportion of the total rehoming centre dog population. Wells et al (2000) argue that this may highlight a reluctance to seek support for behaviour and training problems, or lack of wealth within regions to care for a dog beyond puppyhood. Conversely, the higher number of adult dogs suggests there may be a change in circumstances at this point, or an escalation of behavioural problems, with the average age of diagnosis of behavioural problems suggested to be 3 years (Wells et al 2000), or the potential onset of health problems. The available dogs advertised in the rehoming centres conflicts with the public's reported desire to rehome very young (<6 months) dogs, since the requirement for young dogs does not match availability in rehoming centres (Brown et al 2013; Normando et al 2006). The high number of mixed breed dogs in the puppy age category could be down to an inability to distinguish specific breeds in very young dogs, or a reduced desire to keep mixed breed puppies that have a higher chance of being an unplanned litter compared to purebred puppies.

The lower number of geriatric dogs (>8 years old) relinquished could be indicative of people's desired to keep a dog into old age. By 8 years, many health problems have manifested themselves, with the potential increase in financial costs with age, the restrictions of having to care for a dog in the long term, or changes in personal circumstances already occurring (Brown et al 2013; Lambert et al 2015). The higher number of Jack Russel Terriers and Staffordshire Bull Terriers in the geriatric group could be due to the demographic of the breed owners. Either resulting from owner death (terrier breeds are often associated with older owners due to their small size) or reduced capacity to pay for veterinary treatment. Whilst older dogs are considered more likely to die or be put to sleep due to health reasons, only 2% of the Dogs

Trust population died or was put to sleep in 2018 following relinquishment (Dogs Trust 2018). Siettou et al (2014) did find that >8 year old dogs marginally more likely to be adopted than 5-7 years (adult), suggesting adopter's desire to 'rescue' older dogs as a reason for this finding. The higher number of Greyhounds in the sub-adult age category is likely to relate to the retirement age from racing (McNicol et al 2016). Whilst few age to breed associations were evident, this could be related to the smaller sample sizes in each age category.

The consistently higher number of males compared to females available for 2015 and 2018 is a trend also apparent in American and Australian shelters (Diesel et al 2010; Marston et al 2003; Marston et al 2004; Mondelli et al 2004). Despite sex appearing to be less important compared to other characteristics when adopting from a rehoming centre (Marston et al 2004), Diesel et al (2007) found that female dogs were rehomed quicker than male dogs. Males are also considered to be more likely to suffer from behaviour problems, reducing desirability (Wells et al 2000). This again highlights the disparity between the preference of adopters and the availability of the rehoming centre population.

Limitations of the study

The research provides a valuable insight into the demographics of the canine rehoming centre population in the UK. The data available may be skewed by the fast rate at which puppies are rehomed, and subsequently may not make it onto the website. However, the websites of larger rehoming centres do tend to be regularly updated (at least weekly), even if the dog has been reserved before being added (Siettou et al 2014). Information analysed is based on what is provided, therefore the accuracy of information such as breed (particularly when parentage is unknown) and age is unknown, however, it is the same information provided to the general public.

Conclusion

This study highlights the increasing population of brachycephalic dogs entering the rescue population. It also highlights the consistent nature of the rehoming centre population in terms of age and sex distribution, and the differences in breed, and breed type, with certain breeds overrepresented, less purebred dogs than in the general population and female dogs underrepresented in rehoming centres.

Conflicts of Interest: The authors declare that there are no conflicts of interest with this work.

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