

# Brachycephalic dogs

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## Executive summary

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1. BVA is concerned that the rapid rise in the number of brachycephalic dogs in the UK is leading to a population-based increase of ill health and compromised welfare in these breed types.

2. Society as a whole, including the veterinary professions, dog owners, breeders, registering bodies, breed clubs, academics, animal charities and those with a commercial interest in the use of dogs and their images, have a social and moral responsibility to work together towards:

- ensuring healthier future generations of dogs with brachycephalic conformation
- reducing the negative health and welfare impacts of brachycephaly on the current generation of brachycephalic dogs
- increasing awareness of the health and welfare issues associated with brachycephaly amongst current and prospective owners
- encouraging research in order to better understand and address the prevalence of, and trends in, conformation-related ill-health in brachycephalic dogs
- encouraging research in order to better understand and address the prevalence of the welfare impacts resulting from brachycephaly
- the development of objective, robust measures to contribute to the assessment of problematic conformation

3. In order to achieve this, BVA is advocating a three-strand approach whereby all stakeholders play a role in:

- Driving healthier standards amongst brachycephalic dogs
- Avoiding imagery of brachycephalic dogs in advertising, marketing materials and social media campaigns to reduce demand and prevent the normalisation of their associated health issues
- Supporting and harnessing the influence of the veterinary professions

4. The BVA policy position sets out key actions for stakeholders across dog health and welfare, including the veterinary professions, registering bodies, breeders, the show sector, academia and marketers and advertisers.
5. BVA recognises the need for professional veterinary associations to support their respective memberships to take action by:
  - developing resources and guidance
  - producing targeted communications and consistent messaging
  - providing CPD and engaging with key stakeholders to promote collaborative working across the sector.
6. BVA has developed a 10-point plan for veterinary practices to support vets to further improve the health and welfare of brachycephalic dogs and promote responsible ownership.

## Introduction

In the ten years to 2017 there has been a rapid rise in ownership and number of brachycephalic dogs in the UK (both those that are Kennel Club-registered and in the wider dog population<sup>1</sup>). According to Kennel Club figures, registration of these breed types has risen dramatically of the past ten years, with a 3104% increase in French Bulldog registrations, a 193% increase in Pug registrations and a 96% increase in Bulldog registrations.<sup>2</sup> BVA is concerned that this rise in numbers is leading to a population-based increase of ill health and compromised welfare in these breed types. Figure 1 visually illustrates the rise in proportional annual birth rates amongst some brachycephalic breed types over the 2004-2016 period.

**Figure 1: Graph demonstrating the rise in proportional annual birth rates amongst brachycephalic breeds**

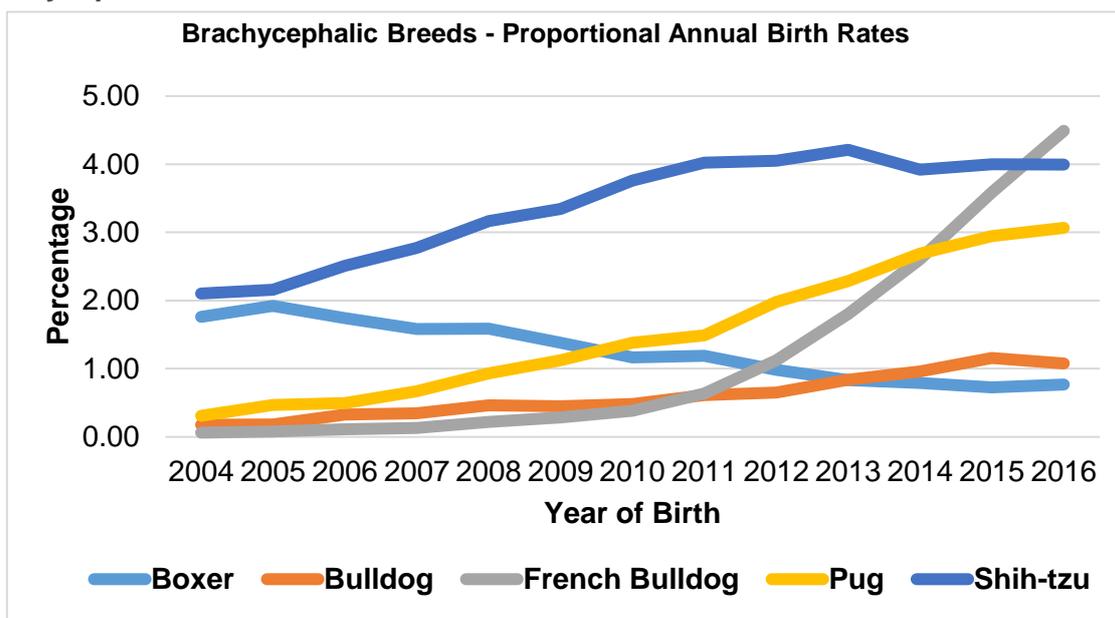


Image credit: Dan O'Neill, VetCompass

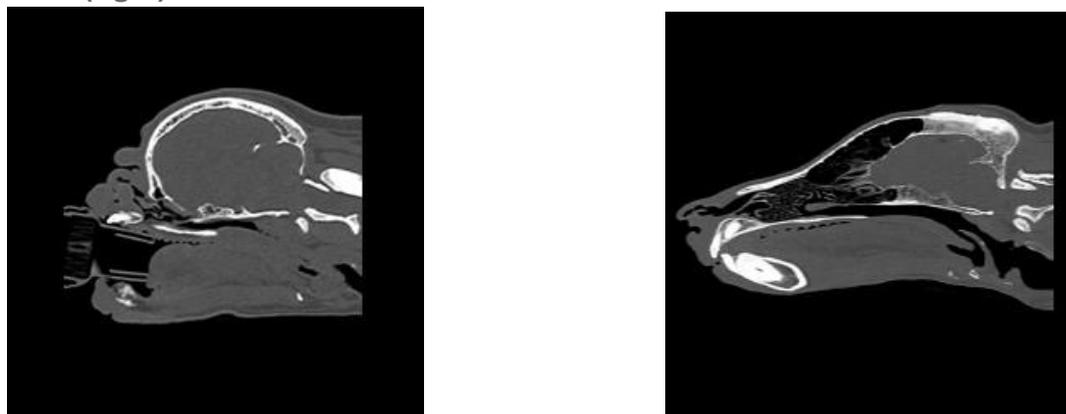
Brachycephaly refers to a short skull shape, which gives the appearance of a flattened face. Figure 2 shows a comparison of two CT scans, demonstrating the difference in skull shapes between a brachycephalic dog - a dog

<sup>1</sup> O'Neill, D.G., Darwent, E.C., Church, D.B. & Brodbelt, D.C. (2016) Demography and health of Pugs under primary veterinary care in England, *Canine Genetics and Epidemiology*. *Canine Genetics and Epidemiology*, 3, 1-12. Available at: <https://link.springer.com/article/10.1186/s40575-016-0035-z>

<sup>2</sup>Kennel Club (2017) 10 Yearly Breed Statistics. Available at: <https://www.thekennelclub.org.uk/media/129029/10yrstatsutility.pdf>

with a shortened skull shape - (left) and a non-brachycephalic dog - a dog with a skull of a proportionate size for their breed type without any abnormality - (right).

**Figure 2: CT scans of a brachycephalic dog skull (left) and a non-brachycephalic dog skull (right)**



*Image credit: Cambridge BOAS Research Group*

## Health and welfare issues associated with brachycephaly

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As a consequence of selective breeding for their appearance and to cater for their high demand, a substantial proportion of dogs with brachycephalic conformation are predisposed to suffer from a range of health problems associated with their extreme conformation. These problems include:

- Anatomical defects of the upper airway causing breathing difficulties often associated with overheating, sleep apnoea and regurgitation (eg. Brachycephalic Obstructive Airway Syndrome (BOAS))<sup>3,4,5</sup> Figure 3 illustrates an example of open nostrils (A) compared against mild (B), moderate (C) and severe (D) stenotic nares or narrowed nostrils that are commonly seen in brachycephalic breeds. Stenotic nares make it difficult for dogs to breathe and are a risk factor of BOAS.

<sup>3</sup> Dupré and Heidenreich (2016) Brachycephalic syndrome. *Vet Clin Small Anim* 46 (2016) 691–707 Available at: [http://www.vetsmall.theclinics.com/article/S0195-5616\(16\)00008-5/abstract](http://www.vetsmall.theclinics.com/article/S0195-5616(16)00008-5/abstract)

<sup>4</sup> Packer RMA, Hendricks A, Tivers MS, Burn CC (2015) Impact of Facial Conformation on Canine Health: Brachycephalic Obstructive Airway Syndrome. *PLoS ONE* 10(10): e0137496. Available at: <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0137496>

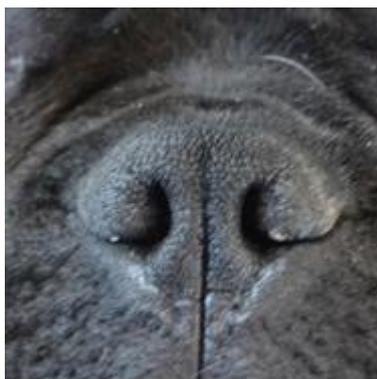
<sup>5</sup> O'Neill DG, Jackson C, Guy JH, Church DB, McGreevy PD, Thomson PC, Brodbelt DC: Epidemiological associations between brachycephaly and upper respiratory tract disorders in dogs attending veterinary practices in England. *Canine Genetics and Epidemiology* 2015, 2(1):10.

- Eye disease<sup>6,7,8, 9</sup>
- Inability to mate or give birth naturally (requiring Caesarean section)<sup>10</sup>

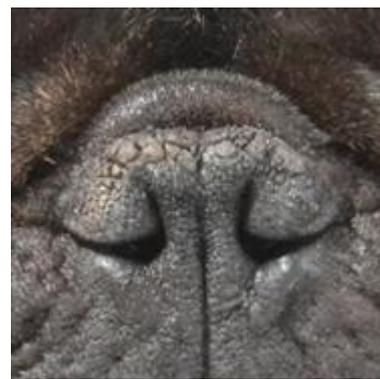
**Figure 3: An example of open nostrils (A) compared against mild (B), moderate (C) and severe (D) stenosis or narrowed nostrils that are commonly seen in brachycephalic breeds and are a risk factor of BOAS.**



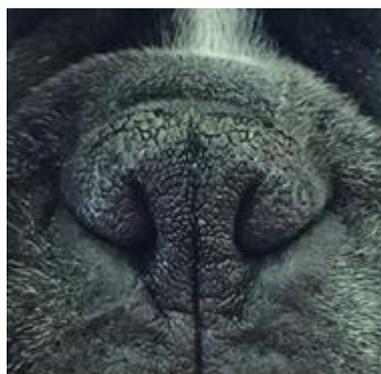
**A – Open nostrils**



**B - Mild stenosis**



**C – Moderate stenosis**



**D – Severe stenosis**

*Image credit: Cambridge BOAS Research Group*

<sup>6</sup> Maggs D, Miller P, Ofri R and Slatter D (2008) *Slatter's Fundamentals of Veterinary Ophthalmology*. 4th Ed. Elsevier Health Sciences: Edinburgh, UK

<sup>7</sup> Bedford P and Jones G (2001) Abnormal appearance in R Pieffer and S Peterson Jones (Eds) *Small animal ophthalmology: a problem oriented approach*. 3rd Ed. Saunders: Philadelphia. pp 59

<sup>8</sup> Mould J (1993) Conditions of the Orbit and Globe in S. Petersen-Jones and S. Crispin's *Manual of small animal ophthalmology*. BSAVA: Cheltenham p 45

<sup>9</sup> O'Neill, D. G., Lee, M. M., Brodbelt, D. C., Church, D. B. & Sanchez, R. F. (2017) Corneal ulcerative disease in dogs under primary veterinary care in England: epidemiology and clinical management. *Canine Genetics and Epidemiology*, **4**, **5**.

<sup>10</sup> O'Neill, DG., O'Sullivan, AM., Manson, EA., Church, DB., Boag, AK., McGreevy, PD., Brodbelt, DC. (2017) Canine dystocia in 50 UK first-opinion emergency-care veterinary practices: prevalence and risk factors *Veterinary Record* **181**, 88.

In these breed types, veterinary surgeons also regularly treat:

- Repeated skin infections associated with conformational abnormalities seen in dogs with brachycephalic conformation eg. intertrigo
- Dental problems
- Obesity

## Societal responsibility

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Society as a whole, including the veterinary professions, dog owners, breeders, registering bodies, breed clubs, academics, animal charities and those with a commercial interest in the use of dogs and their images, have a social and moral responsibility to work together towards:

- ensuring healthier future generations of dogs with brachycephalic conformation
- reducing the negative health and welfare impacts of brachycephaly on the current generation of brachycephalic dogs
- increasing awareness of the health and welfare issues associated with brachycephaly amongst current and prospective owners
- encouraging research in order to better understand and address the prevalence of, and trends in, conformation-related ill-health in brachycephalic dogs
- encouraging research in order to better understand and address the prevalence of the welfare impacts resulting from brachycephaly
- the development of objective, robust measures to contribute to the assessment of problematic conformation

## Driving healthy standards

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BVA recognises that there are different populations of brachycephalic dogs in the UK: those Kennel Club-registered dogs bred to Kennel Club Breed Standards, which may be shown or sold as pets; those dogs bred to be sold as pets by breeders who are part of the Kennel Club Assured Breeder Scheme (ABS); those dogs bred to be sold as pets, either purebred or cross-bred, that have no affiliation with a kennel club, breed society or breeder assurance scheme. At present, we are not aware of any strong evidence to indicate that these different

populations suffer the health and welfare problems that are associated with brachycephaly to a lesser or greater extent.

BVA recognises that there are important interrelationships between these populations. For example, by setting healthier standards and rewarding positive examples of dogs in the show population, the show sector has the potential to drive demand for healthier dog conformations amongst the pet-buying public and incentivise breeders to emulate these standards through the selection of healthier breeding lines. The position of influence of the show population should therefore be harnessed to improve health and welfare outcomes across all populations of dogs, including brachycephalic breed types. This can be achieved through:

## Breed Standards

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Breed Standards should be reviewed according to evidence and be clear in their definitions of healthy conformations. This could be achieved using diagrams, quantitative ratios and conformational limits<sup>11,12,13 14</sup> and developed in consultation with expert veterinary input. Show judges have a role in ensuring that only dogs that meet these standards are placed, encouraging improvements to brachycephalic breed health and incentivising the selection of healthy parents as part of the breeding process.

## Breed health and conservation plans

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BVA supports the Kennel Club's project to develop Breed Health and Conservation Plans for different breeds and welcomes the Kennel Club's intention to formulate these for dogs with brachycephalic conformation. In cases where brachycephaly is linked to serious and persisting health problems, or where other genetic approaches are not available (eg. through

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<sup>11</sup> Liu NC, Troconis EL, Kalmar L, Price DJ, Wright HE, Adams VJ, Sargan DR, Ladlow JF. Conformational risk factors of brachycephalic obstructive airway syndrome (BOAS) in pugs, French bulldogs, and bulldogs. *PLoS One*. 2017 Aug 1;12(8):e0181928.

<sup>12</sup> Liu NC, Oechtering GU, Adams VJ, Kalmar L, Sargan DR, Ladlow JF. (2017) Outcomes and prognostic factors of surgical treatments for brachycephalic obstructive airway syndrome in 3 breeds. *Vet Surg*. 2017 Feb;46(2):271-280

<sup>13</sup> [Liu NC](#), [Sargan DR](#), [Adams VJ](#), [Ladlow JF](#). (2015) Characterisation of Brachycephalic Obstructive Airway Syndrome in French Bulldogs Using Whole-Body Barometric Plethysmography. [PLoS One](#). Jun 16;10(6):e0130741.

<sup>14</sup> Bateson, P. 2010. Independent inquiry into dog breeding. Cambridge: University of Cambridge.

insufficient genetic variability), there is a potential role for evidence-backed outcrossing<sup>15,16</sup> of pedigree brachycephalic dogs with dogs that will confer healthier traits.

## Brachycephalic health assessments

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BVA supports the development of brachycephalic health assessments and their use in both breed shows and veterinary consultations to improve the health and welfare of the current population of brachycephalic dogs and encourage the selection of healthier breeding lines.

Once developed, BVA recommends that all brachycephalic dogs receive an annual brachycephalic health assessment undertaken by their vet to assess any potential difficulties in breathing and other conformational-related health issues.

Further, in order to help judges assess the current [Breed Watch](#) point of concern for 'Dogs showing respiratory distress including difficulty in breathing or laboured breathing' in Brachycephalic Category 3 breeds, we would support the use of a standardised exercise tolerance test (ETT) and functional grading by show judges and veterinary professionals - such as the [functional grading system developed by the Cambridge Veterinary School BOAS Research Group](#).<sup>17</sup>

Robust training and support programmes should also be developed to assist both show judges and veterinary professionals to successfully implement and carry out such health assessments.

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<sup>15</sup> Farrell, L, Schoenebeck, J, Wiener, P, Clements, D & Summers, K 2015, 'The challenges of pedigree dog health: approaches to combating inherited disease' *Canine Genetics and Epidemiology*, vol 2, no. 3. DOI: 10.1186/s40575-015-0014-9

<sup>16</sup> Knowler, S. P., v/d Berg, H., McFadyen, A., La Ragione, R. M., & Rusbridge, C. (2016). Inheritance of Chiari-Like Malformation: Can a Mixed Breeding Reduce the Risk of Syringomyelia? *PLoS ONE*, 11(3), e0151280. <http://doi.org/10.1371/journal.pone.0151280>

<sup>17</sup> Liu NC, Adams VJ, Kalmar L, Ladlow JF\*, Sargan DR\*. (2016) Whole-body barometric plethysmography characterizes upper airway obstructions in 3 brachycephalic breeds of dogs. *Journal of Veterinary Internal Medicine* May;30(3):853-65

## Marketing and advertising

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The prominent use of brachycephalic dogs in marketing campaigns and on various products has the potential to perpetuate the desirability of these breeds.

BVA urges advertisers, designers and veterinary practices to avoid using imagery depicting dogs with brachycephalic conformation to reduce their demand and prevent the normalisation of their associated health issues.

BVA encourages advertisers and designers to consult with a veterinary surgeon before commissioning and using animals in marketing materials.

BVA does, however, recognise that the use of brachycephalic breed-types in imagery may be necessary for purposes of health and welfare education and the advertisement of breed-specific services that seek to improve the health and wellbeing of dogs with brachycephalic conformation.

## The role of the veterinary professions

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BVA believes that as credible and trusted leaders in animal health and welfare, the veterinary professions should take action collaboratively to influence the reduction of unhealthy dogs with brachycephalic conformation and improve health and wellbeing outcomes for the current generation of brachycephalic dogs through consistent messaging.

BVA recognises the need for professional veterinary associations to support their respective memberships to take action by developing resources and guidance; producing targeted communications and consistent messaging; providing CPD and engaging with key stakeholders to promote collaborative working across the sector.

We know that individual veterinary professionals improve the welfare of many brachycephalic dogs on a day-to-day basis through the diagnosis and treatment of problems linked to brachycephaly. Other actions that they can undertake to improve the welfare of dogs with brachycephalic conformation include:

- Promoting and undertaking annual brachycephalic health assessments

- Raising awareness amongst owners of the role of obesity in exacerbating other health problems linked to brachycephaly (eg. respiratory disease<sup>18</sup>) and conveying that frequent respiratory sounds by their dog such as snorting and snoring are not normal, but instead are clinical signs of compromised breathing
- [Reporting conformation-altering surgery and Caesarian sections](#), in Kennel Club-registered dogs, to the Kennel Club

## 10-point plan for veterinary practices

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There are also actions veterinary practices can undertake to improve the welfare of brachycephalic dogs and promote responsible ownership, including:

1. Offer pre-purchase consultations, such as the PDSA [“Which pet?” consultation framework](#), with prospective dog owners. The potential health problems of brachycephalic conformation can be clearly outlined in these consultations
2. Strongly advise against breeding if a dog is suffering from BOAS or requires conformation altering surgery – consider neutering (where best practice allows) to prevent further litters with extremes of conformation that negatively impact on their health and welfare
3. Promote [the Puppy Contract \(comprising the Puppy Information Pack and contract for sale\)](#) through the practice communication channels, eg. website, social media, waiting room displays, newsletters and in local print and broadcast media
4. Promote and actively participate in available health schemes (eg. [BVA/KC Health Schemes](#)), including those for brachycephalic breeds that currently exist amongst Bulldog, French bulldog and Pug breed clubs
5. Carry out [exercise tolerance tests \(ETT\) and functional grading](#) for brachycephalic breeds as part of their annual health assessment
6. Enrol the practice in clinical surveillance programmes such as [VetCompass](#) and [SAVSNET](#), to contribute to data gathering and evidence generation

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<sup>18</sup> Liu NC, Adams VJ, Kalmar L, **Ladlow JF\***, Sargan DR\*. (2016) Whole-body barometric plethysmography characterizes upper airway obstructions in 3 brachycephalic breeds of dogs. Journal of Veterinary Internal Medicine May;30(3):853-65

7. Develop a practice communication strategy to repeatedly, clearly and consistently communicate the health problems experienced by dogs with brachycephalic conformation through the practice communication channels
8. Develop practice policy to ensure that practice communication channels (particularly social media and advertising materials) do not portray dogs with brachycephalic conformation as cute, humorous or appealing
9. Ensure practice policy supports staff to appropriately convey evidence-based information and advice to owners of dogs with brachycephalic conformation
10. Support local breed clubs and representatives to develop and implement plans to improve the health of dogs with brachycephalic conformation

## Research

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BVA recognises the need for funded research and extended data gathering to better understand and address the prevalence of, and trends in, conformation-related ill-health in brachycephalic dogs and the welfare impacts resulting from brachycephaly.

BVA would welcome the development of breed specific objective assessment measurements, ratios or indices to contribute to the assessment of problematic brachycephalic conformations leading to negative health and welfare impacts, as well as the further development of non-invasive functional health testing eg. exercise tolerance tests (ETT)s or accurate genetic tests.

In addition, we would welcome extended gathering of surveillance data on all dogs with brachycephalic conformation, including Kennel Club and non-Kennel Club registered dogs, and encourage veterinary practices to enrol in clinical surveillance programmes such as [VetCompass](#) and [SAVSNET](#) to contribute to improved data gathering and evidence generation.

Equally, BVA believes it is important to carry out enhanced research to measure the welfare impacts of brachycephaly and better understand the social influences that drive breed demand in order to develop targeted educational strategies that will influence purchasing behaviours.