REFERENCES

1. American Pet Products Association (APPA), 2013-2014 National Pet Owners Survey, http://www.americanpetproducts.org/press_industrytrends.asp (accessed March 29, 2014)
2. Gilchrist J, Sacks JJ, White D, et al. Dog bites: still a problem? Inj Prev 2008;14:296-301 doi:10.1136/ip.2007.016220
3. Langley RL. Animal-related injuries resulting in emergency department visits and hospitalizations in the United States, 2006-2008. Hum Wild L Interact 2012;6(1):123-136
4. Patronek GJ, Slater M, Marder A. Use of a number-needed-to-ban calculation to illustrate limitations of breed-specific legislation in decreasing the risk of dog bite-related injury. J Am Vet Med Assoc 2010;237(7):788-792 doi:10.2460/javma.237.7.788
5. Collier S. Breed-specific legislation and the pit bull terrier: Are the laws justified? J Vet Behav Clin App Reserc 2006;1:17-22. doi:10.1016/j.jveb.2006.04.011
6. Cornelissen J, Hopster H. Dog bites in The Netherlands: A study of victims, injuries, circumstances and aggressors to support evaluation of breed specific legislation. Vet J 2010;186(3):292-298. doi:10.1016/j.tvjl.2009.10.001
7. Rosado B, Garcia-Belenguer S, León M, et al. Spanish dangerous animal act: Effect on the epidemiology of dog bites. J Vet Behav Clin App Researc 2007;2(5):166-174 doi:10.1016/j.jveb.2007.07.010
8. Shalke E, Ott SA, von Gaertner AM, et al. Is breed-specific legislation justified? Study of the results of the temperament test of Lower Saxony. J Vet Behav Clin App Reserc 2008;3:97-103. doi:10.1016/j.jveb.2007.10.004
9. Patronek GJ, Sacks JJ, Delise KM, et al. Co-occurrence of potentially preventable factors in 256 dog bite-related fatalities in the United States (2000-2009). J Am Vet Med Assoc 2013;243:1726-1736 doi:10.2460/javma.243.12.1726
10. Denenberg S, Landsberg G, Horwitz D, et al. A comparison of cases referred to behaviorist in three different countries. In: Mills D, Levine E, Landsberg G, et al. Eds. Current Issues and research in veterinary behavioral medicine. West Lafayette IN, Purdue Press 2005:56-62
11. Sacks JJ, Sinclair L, Gilchrist J, et al. Breeds of dogs involved in fatal human attacks in the United States between 1979 and 1998. J Am Vet Med Assoc. 2000;217(6):836-40 doi:10.2460/javma.2000.217.836
12. Netto WJ, Planta DJU. Behavioural testing for aggression in the domestic dog. Appl Anim Behav Sci. 1997;52:243-263 doi:10.1016/S0168-1591(96)01126-4
13. Ott SA, Schalke E, von Gaertner AM, et al. Is there a difference? Comparison of golden retrievers and dogs affected by breed-specific legistlation regarding aggressive behavior. J Vet Behav Clin App Reserc 2008;3:134-140. doi:10.1016/j.jveb.2007.09.009
14. AVMA. US pet ownership and demographics sourcebook. Schaumburg, Ill: AVMA, 2012
15. Scott J, Fuller J. Genetic and Social Behavior of the dog, The Classic Study. The University Of Chicago Press, Chicago IL 1965
16. Simpson RJ, Simpson KJ, VanKavage L. Rethinking dog breed identification in veterinary practice. J Am Vet Med Assoc. 2012;241(9):1163-1166 doi:10.2460/javma.241.9.116
17. Boyko AR, Quignon P, Li L, et al. A simple genetic architecture underlies morphological variation in dogs. PLOS Biol. 2010;8(8):e1000451 doi:10.1371/journal.pbio.1000451
18. Rimbault M, Ostrander EA. So many doggone traits: mapping genetics of multiple phenotypes in the domestic dog. Hum Mol Genet 2012;21(1):R52-R57; doi:10.1093/hmg/dds323
19. Voith VL, Trevejo R, Dowling-Guyer S, et al. Comparison of visual and DNA breed identification of dogs and inter-observer reliability. Am J Socio Res 2013;3(2):17-29. doi:10.5923/j.sociology.20130302.02
20. Voith V, Ingram E, Mitsouris K, et al. Comparison of the adoption agency breed identification and DNA breed identification in dogs. J App Anim Welf Sci 2009;12:253-262 doi:10.1080/10888700902956151
21. Heath S. Why do dogs bite? Eur J Comp Anim Pract 2005;15(2):29-32
22. Landsberg G, Hunthausen W, Ackerman L. Behavior Problems of the Dog and Cat, 3rd ed. Elsevier 2013
23. Houpt KA. Domestic Animal Behavior for Veterinarian and Animal Scientists. Wiley-Blackwell publishing 2011
24. Serpell J, Jagoe J. Early experience and the development of behaviour. In: Serpell J. ed, The Domestic Dog: Its Evolution, Behaviour, and Interaction with People. Cambridge University Press, Cambridge UK 1995
25. Herron M, Shofer F, Reisner I. Survey of the use and outcome of confrontational and non-confrontational training methods in client-owned dogs showing undesirable behaviors. App Anim Behav Sci 2009;117:47-54 doi: 10.1016/j.applanim.2008.12.011
26. Love M, Overall KL. How anticipating relationships between dogs and children can help prevent disasters. J Am Vet Med Assoc 2001;219(4):446-453 doi: 10.2460/javma.2001.219.446
27. Raghavan M, Martens PJ, Chateau D, et al. Effectiveness of breed-specific legislation in decreasing the incidence of dog-bite injury hospitalizations in people in the Canadian province of Manitoba. Inj Prev 2012;19:177-183. doi: 10.1136/injuryprev-2012-040389
28. Clarke NM, Fraser D. Animal control measures and their relationship to the reported incidence of dog bites in urban Canadian municipalities. Can Vet J 2013;45:145-149
29. Dutch Agriculture Minister scraps pit bull ban. http://www.expatica.com/nl/news/local_news/Dutch-Agriculture-Minister-scraps-pit-bull-ban.html. (accessed 1 March 2014)
30. Iadrcro Information, updated May, 2011. http://www.iadcro.com/italia.html. (accessed 3 March 2014)
31. Marcus P. Do dogs breed bans work? The Denver Daily News http://stopbsl.com/2009/03/03/denver-co-do-dog-breed-bans-work/ March 2009 (accessed March 30, 2014)
32. Ohio Legislature 129th General Assembly Substitute House Bill Number 14. 2012; http://www.legislature.state.oh.us/BillText129/129_HB_14_EN_N.pdf (accessed March 30, 2014)
33. AVMA Guidelines for Responsible Pet Ownership: https://www.avma.org KB/Policies/Pages/Guidelines-for-Responsible-Pet-Ownership.aspx (accessed March 30, 2014)
34. DePaul University and Best Friends Animal Society. Companion Animals and A Strategic Assessment for the City of Chicago, March 2010 http://las.depaul.edu/chaddick/docs/Docs/Companion_Animal_Final_Report_030310.pdf (accessed March 30, 2014)
35. Beaver B, Baker D, Gloster R, et al. American Veterinary Medical Association Task Force on Canine Aggression and Human-Canine Interactions: A community approach to dog bite prevention. J Am Vet Med Assoc 2001;218(11):1732-1749 doi: 10.2460/javma.2001.218.1732
36. City of Calgary Responsible Pet Ownership Bylaw: http://www.calgary.ca/CA/city-clerks/Documents/Legislative-services/Bylaws/23M2006-ResponsiblePetOwnership.pdf (accessed March 30, 2014)
37. Calgary dog licensing compliance stat: http://www.calgary.ca/CSPS/ABS/Documents/Animal-Services/Animal-statistics/Licensing%20Compliance.pdf (accessed March 30, 2014)
38. National Canine Research Council. A Community Model for Responsible pet ownership: Calgary, Alberta http://www.nationalcanineresearchcouncil.com/uploaded_files/tinymce/Community%20Model%20for%20RPO_Calgary.pdf (accessed 4 March 2014)
39. Reports of Dog Aggression Over Time, City of Calgary Animal Services. http://www.calgary.ca/CSPS/ABS/Documents/Animal-Services/Animal-statistics/reports%20of%20Dog%20Aggression%20Over%20Time.pdf (accessed March 30, 2014)

AVSAB

Position Statement on Breed-Specific Legislation

AVSAB
American Veterinary Society of Animal Behavior
www.AVSAB.org

The American Veterinary Society of Animal Behavior (AVSAB) is concerned about the propensity of various communities' reliance on breed-specific legislation as a tool to decrease the risk and incidence of dog bites to humans.

The AVSAB's position is that such legislation—often called breed-specific legislation (BSL)–is ineffective, and can lead to a false sense of community safety as well as welfare concerns for dogs identified (often incorrectly) as belonging to specific breeds.

The importance of the reduction of dog bites is critical; however, the AVSAB's view is that matching pet dogs to appropriate households, adequate early socialization and appropriate training, and owner and community education are most effective in preventing dog bites. Therefore, the AVSAB does support appropriate legislation regarding dangerous dogs, provided that it is education based and not breed specific.

Facts About Dog Bites

According to the 2013-2014 American Pet Product Association National Pet Owners Survey, there are an estimated 83.3 million dogs in America and estimated 56.7 million households with at least one dog.[1] Dog bite data varies greatly; not all bites are reported, and those reported aren't always documented into databases. The Centers for Disease Control and Prevention indicates that between 2001-2003 there were over 4.5 million dog bites annually in the U.S. Nearly one of five bite victims requires medical attention.[2] Dog bites accounted for an average of 311,000 emergency room visits per year between 2006-2008 in the U.S. (most involving children); however, only 2.3% required hospitalization.[3]

Dog bite fatalities are very rare; between 1999-2006, there was an average of 27 fatal dog attacks per year in the U.S., which is approximately three fatal bites/10 million dogs/year.[4] It is widely accepted that every effort must be made to reduce these numbers, and one of the most common proposals to reduce the number of dog bite related injuries is breed-specific legislation.

What is Breed-Specific Legislation?

Breed-specific legislation refers to public policies or legal statutes that control, limit or prevent ownership of specific dog breeds or mixes. Breeds listed as "dangerous" in this type of legislation commonly include pit bull-type dogs (dogs with a "pit bull look") as well as the purebred American Pit Bull Terrier, American Staffordshire Terrier, Staffordshire Bull Terrier and Bull Terrier. Often other breeds are included in BSL, including the Rottweiler, Doberman Pinscher, Bullmastiff, Mastiff, Akita and German Shepherd Dog.[5-8]

Breed-specific legislation may ban ownership of targeted breeds all together, or dogs suggested as being a certain breed, or a mix of specific breeds. BSL may also mandate specific restrictions for breeds or mixes, such as requiring owners to spay or neuter their dogs, muzzle their dogs in public and/or carry extra liability insurance. Breed-specific legislation does not take current or historical behavior into account, or genetics, so dogs simply profiled as one of the targeted breeds (accurately or not) classifies that dog as "dangerous."

Calls for BSL increased in response to a perceived increase in the number and severity of dog bites in the1970s, particularly from dogs identified as pit bulls. Popular culture spreads images of dangerous pit bull-type dogs, and this perpetuates fears and many inaccuracies, such as the often repeated fallacy that such dogs have "locking jaws."

These fears contributed to motivating public officials in many countries to take action. Many American municipalities have enacted breed restrictions or bans, including Boston; Denver; Kansas City, MO; and Miami-Dade County, FL. Similar legislation was implemented across the entire province of Ontario and the city of Winnipeg in Canada, as well as in countries including Brazil, Denmark, Germany, Ireland, Israel, Malaysia, the Netherlands, Norway, Spain and the United Kingdom.

What Breeds Bite?

Any dog may bite, regardless of the dog's size or sex, or reported breed or mix of breeds. Twenty breeds and mixes were identified as being involved in 256 fatal attacks in the U.S. Between 2000-2009.[9] Denenberg, et al. (2005) surveyed three veterinary behavior referral centers in the U.S., Canada and Australia, finding that Jack Russell Terriers, Labrador Retrievers and Golden Retrievers were the breeds most commonly referred for aggression.[10]

A study of dog breeds involved in fatal attacks in the U.S. between 1979-1998 revealed 31 breeds or mixes were responsible for 238 attacks.[11] Over half of these incidents were reported to involve pit bull-type dogs and Rottweilers; however, breed identifications were usually based upon media reports and therefore could not always be substantiated. The 29 other breeds responsible for deaths included the American Cocker Spaniel, Boxer, Chesapeake Bay Retriever, West Highland White Terrier, and other breeds with reputations as family-friendly pets.[11]

An examination of stringent, state-regulated compulsory temperament tests administered in Lower Saxony, Germany, found that 95% of the population of 415 dogs of "dangerous breeds" reacted appropriately to test situations.[8,12] When "friendly breeds" were tested, their scores were similar, exposing the fallacy that targeted breeds presumed to be dangerous were, in fact, no

more dangerous than breeds considered to be friendly.[13]

Breed alone is not predictive of the risk of aggressive behavior. Dogs and owners must be evaluated individually.[10]

Breed Misidentification

The AVMA reported in 2012 that approximately 46% of dogs in the U.S. were mixed breed.[14] While there are purebred "bully breeds," (such as the American Pit Bull Terrier, American Staffordshire Terrier, etc.) most dogs referred to as "pit bulls" are merely individuals with a common general phenotype (or appearance). Thus, an additional concern regarding BSL involves accurately identifying breeds or mixes that presumably fall under the restrictions. Visual identification is not reliable. Presumed breed identification is often made by neighbors, public officials, law enforcement, reporters, etc.—not necessarily by people who work with animals—and even those professionals may not know.

Modern DNA testing has proven what Scott and Fuller first demonstrated in 1965—that mixed breed dogs might not look like either parent dog. In a classic experiment breeding Basenjis with English Cocker Spaniels, not all of the first or second generation offspring resembled either of the parent breeds.[15] In fact, those offspring were often identified by "experts" as altogether different breeds, including Beagle mixes or Golden Retriever mixes.

A study published in the *Journal of the American Veterinary Medical Association* illustrated the difficulties in identifying the breeds accurately. Under BSL, dogs that resemble pit bulls or pit bull mixes are frequently confiscated and/or euthanized by authorities, even if they have never exhibited aggression. Since no scientific proof is required to establish breeds and inaccurate reporting of alleged breed has such great repercussions, it is now recommended that veterinarians and shelters refrain from trying to identify breed mixes visually.[16]

Today, we know that only about 1% of the canine genome appears to be responsible for the great physical variation apparent among dog breeds.[17,18] In other words, a dog's physical appearance (phenotype) does not necessarily correspond with genetic composition (genotype). As Voith, et al. (2013) state, "A dog could genetically be 50 percent German Shepherd Dog and lack the genomic regions responsible for the German Shepherd Dog size, coat color, muzzle length and ear properties."[19]

Dog DNA tests reveal that even professionals experienced at identifying dog breeds (veterinarians, dog trainers, breeders, animal control officials, shelter workers, etc.) are unable to reliably identify breeds visually.[16,19] These professionals are the ones who are often responsible for making breed identifications, which are recorded into veterinary reports, pet adoption papers, bite reports, etc. A study published in 2009 proved that visual ID was usually inaccurate compared to canine genetic testing.[20] The breed identification assigned at adoption was compared to DNA test results for those dogs, and not surprisingly the visual ID matched the predominant breed proven in DNA analysis in only 25% of the dogs.[20] Follow-up studies confirm that visual breed identification is highly inconsistent and inaccurate.[19]

Why Do Dogs Bite?

Aggression is a context-dependent behavior and is associated with many different motivations (i.e., defensive, learned, fearful or territorial). Most dogs that show aggression do so to eliminate a perceived threat, either to their safety or to the possession of a resource. In other words, most aggression is fear-based. Whether dogs use aggression appropriately is influenced by a large number of factors, including early environment, genetics, learning, physical health and mental health.[21-23]

Once any dog practices aggression, the behavior often continues. As a result, people or other dogs (the perceived threat) back off, and therefore the behavior is reinforced.

The primary goals for behavior management of aggressive dogs are safety and eliminating the triggers of aggression.[21-23] Identifying these triggers and the needs of the individual dog, a veterinary exam (to rule out a contributing medical explanation), and receiving qualified professional behavioral advice are far more relevant to treating aggression than breed identification.

An appropriate understanding of canine signaling, or body language, can help both owners and potential victims predict the immediate intention of a dog and take action to prevent a bite.[22] Responsible breeding and puppy-raising play an important role in preventing aggressive behaviors, irrespective of breed or mix. Appropriate socialization and managing early onset of fears in young puppies can minimize the risk for future undesired behaviors and fears.[24] (For more information see the AVSAB position statement on socialization.)

Family dogs develop positive associations with humans through daily interactions, socialization and training. Dogs restricted from such interactions may be termed "resident dogs." Resident dogs have an owner, but spend most of their lives isolated, even abused by modern American standards. These dogs may be fenced or chained away from people and normal interactions, or simply ignored and don't benefit from early training.[9] As a result, resident dogs may be more likely to express aggression and also perhaps other anxieties since fear of people, fear of other animals and fear of novel situations are among the most common explanations for aggression in dogs.

Responsible dog ownership and public education must be a primary focus of any dog bite prevention policy.

Furthermore, aversive training methods including verbal reprimands, physical abuse, and shock collars are associated with an increase in aggressive behavior, especially toward the owner.[25] (Consult the AVSAB position statement on punishment for more information.)

Resident dogs are more likely to be mismanaged or neglected than family pets; taken together, these conditions predispose resident dogs to be more territorial and protective of their environments.[9] Not surprisingly, 76.2% of dog bite related fatalities in the U.S. between 2000-2009 involved dogs defined as resident dogs. Male dogs were most likely (87.5%) to be involved in fatal attacks, and 84.4% were not neutered. It is important to note that intact males are not inherently more aggressive, but instead more likely to roam. The breed of these resident dogs was reliably assigned in only 45 of 256 cases (17.6%); 20 breeds and two mixes were identified.[9]

AVSAB

Patronek, et al. reported 75% of fatal dog bites occurred on the owner's property, where under typical breed-specific legislation, a dog would not be required to be muzzled or restrained.[9,11] The owner was not present during 87% of fatal dog bite related attacks in the U.S. between 2000-2009, and 85% of the victims had no or only an incidental relationship with the dog.

Furthermore, in 37.5% of the cases, the owners knew the dogs were dangerous or had allowed them to run loose and/or repeat potentially dangerous behaviors, and in over 20% of the cases the dogs had been neglected or abused. In most cases, multiple factors were involved and are predictive of a "dog attack waiting to happen. These factors are more predictive than the alleged breed or mix of breeds."[9]

It's clear that the lack of responsible dog ownership is a major contributing factor in serious dog attacks, including fatalities.[9,26] Based on the data, BSL would not have prevented any of the fatal attacks during this time period.

Results of Breed-Specific Legislation

Breed-specific legislation can have unintended adverse effects. Owners of a banned breed may avoid veterinary visits and therefore vaccinations (including rabies) to elude seizure of the dog by authorities and/or euthanasia. This negatively impacts both the welfare of dogs and public health. Similarly, owners may forego socializing or training their puppies, which increases the risk of behavior problems, including fear and aggression in adulthood.

Of course, owners who acquire dogs for fighting aren't likely to comply with BSL requirements. In addition, due to budget and staffing constraints, BSL is often enforced inconsistently or not at all.

A study of dog bites in Spain between 1990-1995 (before the 2000 Dangerous Dog Act was enacted) compared to another study conducted from 2000-2004 revealed no difference in the distribution of dog breeds involved in bites; in fact, fewer than 4% of the bites in each of the time periods were caused by dogs on the dangerous breeds ban list.[7]

In Winnipeg, Manitoba, there was no difference in the incidence of dog bite injury hospitalizations prior to or following the enactment of BSL.[27] A cross-Canada study published in 2013 also concluded that there was no difference in the dog bite incidences between municipalities with and without breed-specific legislation.[28]

In 2008, the Dutch government repealed a 15-year nationwide ban on pit bulls after a government study showed it to be ineffective.[6,29] Following the change, dogs were to be judged based on their behavior, not breed, size or appearance. A similar list of "dangerous breeds" was repealed in Italy in 2009 with the focus changing to responsible ownership.[30]

Breed-specific legislation effectiveness is also under scrutiny in the United States. Denver enacted BSL in 1989. Denver has since experienced a higher rate of hospitalizations as a result of dog bite related injuries than breed-neutral Boulder, CO.[31] In May 2012, the state of Ohio passed legislation removing pit bulls from its definition of vicious dogs, and made other changes to put the focus on dangerous dogs (irrespective of breed or mix) and responsible ownership.[32]

What Does Work? Effective Ways to Reduce the Incidence of Aggression

Responsible dog ownership and public education must be a primary focus of any dog bite prevention policy. The AVMA Guidelines for Responsible Pet Ownership include licensing, training, socializing, spaying/neutering, and providing appropriate homes and veterinary care for pets.[33] In Chicago, a Task Force on Companion Animals and Public Safety was devised to guide public officials regarding responsible ownership, animal control, and reducing dog attacks on people.[34] The Task Force concluded that "responsible ownership is the key to reducing canine aggression." After implementing an education program, the state of Nevada was able to reduce the incidence of dog bites by approximately 15%.[35]

The city of Calgary (Alberta, Canada) has a "Responsible Pet Ownership Bylaw" requirement for pet licensing, and stiff fines are levied for bylaw infractions.[36] As a result, approximately 90% of dogs were licensed as of 2010, far outnumbering most cities in North America.[28,35,37] Revenue from licensing and fines funds the Animal Services Department and its extensive dog safety public awareness and education programs.[38] Between 1985 and 2012 the city of Calgary experienced over 50% reduction in the dog aggression reporting rate.[39] The "Calgary Model" is being adopted in other communities as a solution that can actually make a difference—individual dogs may be designated as dangerous based upon proven behavior, instead of profiling specific breeds or mixes.

Aggression is a context-dependent behavior and is associated with many different motivations. Most dogs that show aggression do so to eliminate a perceived threat, either to their safety or to the possession of a resource. In other words, most aggression is fear-based.

Reaching young people in Calgary (and elsewhere) has proven to decrease dog bites; just an hour of dog safety training in second and third grades can reduce these attacks by 80%.[35]

Dog bites are a community concern and thus, to some extent, a community responsibility. In many instances, community members are aware that an individual dog is potentially dangerous, but officials have not responded to complaints, or residents are too intimidated by problem dogs and their owners to complain. When a certain breed becomes popular, the increased demand leads to inappropriate breeding practices, which can manifest in health and behavior problems. Thus, all who are involved in owning, breeding, raising, training, and treating (both medical and behavioral problems) dogs should support responsible ownership and public education, leading to a safer environment for both people and dogs.

The American Veterinary Society of Animal Behavior invites you to share this position statement on breed-specific legislation to discount common fallacies of "easy fixes" that are often based on myths, and instead promote awareness that will reduce the prevalence of aggression toward people and promote better care, understanding, and welfare of our canine companions.