

## **Epidemiologic Aspects of Breed Specific Vicious Dog Legislation.**

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### ISSUES

**There are two questions involved in breed-specific vicious dog legislation.**

1. Do "pit bulls" bite more often than other breeds of dogs? Do "pit bulls" cause more severe bites than other breeds of dogs? Do "pit bulls" cause more deaths than other breeds of dogs? These are really all the same question with different end points and will be discussed as one question.
2. If the answer to question 1 is **yes**, then do "pit bulls" bite more often because of an inherent genetic predisposition to do so or is this a result of environmental factors, i.e. owners, training, etc.?

I will describe the epidemiologic evidence required to conclude that there is an increased risk with certain breeds and then review the available literature.

Epidemiology has proven very useful in elucidating risk factors and predisposing factors for a large number of human conditions, particularly those conditions which, because of ethical or other restrictions, cannot be studied experimentally. This is precisely the case with the questions here. Ideally, one could raise litters of various breeds of dogs under uniform conditions, then provoke them in a uniform manner and determine the number of bites or deaths caused by each breed. Obviously, this is impossible, so we must turn to epidemiologic methodology to winnow out what we want to know from the information that is available or can be gathered. What follows is not my opinion, but the procedure required to reach a statistically valid conclusion in an epidemiologic study.

Do "pit bulls" bite more often than other breeds of dogs? To answer this we must know three things - the total number of bites (or severe bites or deaths due to dogs) within a defined area; the number of these bites due to "pit bulls"; and the proportion of "pit bulls" to all dogs within the defined area. Definitions are of utmost importance and must be reasonable and consistent throughout the study; any variation in the definitions will

invalidate the study.

We can compare this problem to other, better known epidemiologic issues, for example smoking and lung cancer. Before **we** begin, we must define smoking and lung cancer. Is a smoker, someone currently smoking, someone who has ever smoked, someone who smokes at least a pack a day? Are pipe-smokers included? Cigar smokers? What are the requirements for a diagnosis of lung cancer? Is a biopsy necessary? X-rays? What of someone who dies without seeking medical care? Is death certificate data adequate?

It **is** the same In the *pit* bull situation, What **is** a "pit bull"? This must be clearly stated and reproducible. It is preferable that one person make the judgment in every situation. If this is not possible, there should be some measure of inter-observer variation, that **is**, how often do two or more people agree that a dog is a "pit bull"? The second definition needed is what constitutes a dog bite? There is a vast spectrum of bites, ranging from playful nips to death. This definition must be chosen without an inherent bias. For example, we could use all bites that require medical attention or all bites reported to the police or health authorities or all deaths due to dog bites. We should not use, however, all bites that are published in the media. A "pit bull" bite is news, a cocker bite is not. A bite on a slow day in August is news, a bite on the same day as a major airline disaster is not.

Having decided what is a bite, all bites within a given area must be ascertained. If medical attention is our criteria, efforts must be made to contact every hospital, emergency room and general practice physician within the area. Every patient seen for a dog bite-injury must be included. Complete ascertainment is essential; one cannot study only selected bites. It is tempting to include only those bites that come to our attention readily, for example, those described in news media. This choice will almost certainly result in a biased selection and probably an over-representation of bizarre events and bites by "pit bulls", the media's current favourite whipping boy. Every dog bite must be followed up and the breed of the biting dog determined. A single observer or a small group of veil-trained observers should make the judgement. The majority of dog bites occur to family members and, in most cases, the individual bitten is aware of the breed of dog. However, the ability of someone attacked by a strange dog to name the breed may not be reliable. It is important that breeds are consistently described. Given the hysteria that surrounds the breed today, bites are likely to be ascribed to "pit bulls" regardless of the physical characteristics of the dog in question.

Now comes the hard part, determining the composition of dogs in the area by breed. This must be done by a survey method. If, and only if, every dog in the catchment area is licensed or registered in some way and identified consistently, can this be done with license or registration figures. Licensing figures are usually very unreliable. A large number of dogs in any area are unlicensed. Even worse, an unlicensed dog may be more apt to also be a biting dog. Thus, license figures under-represent the very dogs one is most interested in. Because of the current hysteria, owners of "pit bulls" may state a term other than "pit bull" (such as terrier or mixed breed) on the license form and, in many cases, omit licensing their dog altogether. "Fit bulls" would b<sup>^</sup> therefore be under-represented in license statistics and, for reasons mentioned above, be over-represented in bite statistics.

## REVIEW OF THE LITERATURE

I have chosen several of the better papers available on bite frequencies by breed in order to elaborate on the points developed under ISSUES. Copies of these articles are attached.

The best paper is the one by Hanna & Selby [Public Health Reports 96:580, 1981]. All their data, both numerator and denominator, were collected from one source. They used a well-defined population (residents on two air force bases) from which to estimate bite frequencies and efforts were made to collect information on all bite incidents in which the victim sought medical care. The distribution of breeds on the bases was determined from a sample of registrations maintained by the Base Veterinary Services. Because medical care is free or very inexpensive at the base, they are likely to have obtained practically all of the bites occurring in this population. I would expect that veterinary care is also much less expensive when the base services are used and there are probably strong incentives for registering all pets on the base. Thus, in this instance, the Base Veterinary Services is a good source for information on the breeds on the base. In addition, these veterinarians were notified of any bites and located and examined the biting animal. This is a situation where the same observers were in a position to assess the entire population of dogs as to breeds and to also identify the biting dog. Hanna & Selby found that three breeds of dogs (collie, German shepherd and cocker spaniel) were responsible for more bites than would be expected based on their relative numbers in the population.

The next paper is by Lauer et al. [American Journal of Diseases of Children 136:202, 1982] and is a survey of children attending a Denver pediatric group practice. Parents were asked as to whether their child had ever been bitten and also as to whether the family had a dog. Thus, while there are some problems and potential biases with this approach, the numerator (biting dogs) and the denominator (dogs in contact with potential victims) do come from the same population. Only 10% of the bites were from stray dogs or from dogs owned by persons other than friends, relatives, or neighbours. Family dogs, neighbour dogs, and dogs owned by relatives are likely to be similar to dogs owned by the group surveyed. The only breed found to be over-represented among bite incidents were German shepherds and German shepherd mixes.

Pinckney & Kennedy (Pediatrics 69:193, 1982) identified deaths from dog attacks from newspaper articles and the medical literature. Their study is very flawed in that they made no attempt to locate all such deaths, they made no attempt to verify the reports and, while they initially planned to include only incidents from May 1975 to April 1980, they wound up including incidents from a much greater period - March 1966 through June 1980. One is left wondering why the period was extended to include the 22 additional deaths outside the original study period. Was this a post-hoc analysis to prove some point? To compound these errors with their article, they used American Kennel Club registration figures as their denominator. The bullterrier they apparently equate with pit bull; they do not even include other AKC bull-and-terrier breeds in their registration figures. Furthermore, they seem totally unaware that the pit bulls are registered with other registries. At the time of this article (1976), the estimated number of pit bulls registered with UKC and the ADBA was probably close to 40,000 a year. This paper uses a badly biased sample in the numerator; the authors make no effort to verify cases or facts; and their choice of figures for the denominator bear no

resemblance to reality.

The final paper in this group is not a study of bite frequencies but rather an in depth examination of four incidents of attacks by dogs resulting in death or serious injury. The authors were looking for qualities in common with all four incidents. They conclude

- (1) "most of the dogs had a history of previous aggressive threats towards people, ...there had been no attempt by responsible adults to inhibit threatening and aggressive behaviour directed at some people. Some of the dogs were even reportedly encouraged to act aggressively toward some people."
- (2) "All of the animals ...were loose or unsupervised at the time of the incident."
- (3) "Severe dog attacks are a probable product of many factors, including the size, number, and nutritional status of the dogs; their previous aggressive encounters with people; the age, size, health, and behaviour of the victim; • and the absence of other human beings in the vicinity."
- (4) "The most practical point of intervention is at the level of owner responsibility. Dogs, especially those with a history of threatening any human being, should not be allowed to run free or interact with people unless they are under control. Ideally, companion dogs should not threaten anyone. If owners wish to keep a dog that exhibits uncontrolled aggressive tendencies, they should seek professional help to treat these tendencies."

Carefully planned experiments to study the inheritance of behaviour in dogs have been done at Jackson Laboratories in Bar Harbour, Maine. These are briefly described in *The New Knowledge of Dog Psychology* by Clarence Pfaffenberger (reference 6).

These studies are vastly different from the observations and anecdotes published by Donald Clifford et al. [*Journal of the American Veterinary Medical Association* 183:654, 1983 and *Community Animal Control* September-October 1986].<sup>^</sup>

In the JAVMA article by Clifford et al., the authors describes the physical characteristics of 32 fighting dogs seized in the Toledo Ohio area. These dogs were unquestionably fought, but the authors offer no evidence that they were of any particular breed. There is no documentation that they were registered or even purebred. In fact, the authors claim that when a bitch gave birth to 7 puppies/ these pups resembled three different breeds.

They note that wounds, abscesses and scars were common on all the dogs, including young puppies. Granulomas, ringworm and healed fractures were also noted. The endoparasite burden of these dogs "...resembled those reported in pound (stray and abandoned) dogs." Five of the 32 dogs had demodectic mange. These unfortunate animals hardly seem like an appropriate sample from which to make judgments about the inherent characteristics of a large and variable group of dogs.

Yet, Clifford & Segrest do that in a subsequent article in *Community Animal Control*. Based on these dogs and another group of animals seized by the New Mexico State Police, the authors condemn, with no scientific evidence, all breeds of dogs that they regard as "pit bulls". This is without even offering any evidence that the dogs they observed were "pit bulls". Their article is filled with unsupported and peremptory statements.

"Pit bull aficionados will argue that all dogs chase cats. While it is true that many dogs chase cats, few dogs kill them." (Cat heaven is full of cats who thought so.)

"The stance of the pit bull is challenging and defiant. This characteristic is shared

with some other dogs, especially terriers, but not to the same degree." (And how was this degree quantified?)

"The feats of pit bulls in swimming, climbing trees, catching games, pulling sleds, climbing fences, digging under buildings and barriers, jumping, etc. are remarkable and not matched in general by any other group of dogs." (I assume, these abilities were all tested in rigorous competitions with other breeds - sort of a canine Olympics.)

"The security required to contain these dogs in transit as well as secondary barriers around exercise or leading areas and lock on the doors of pens must be well planned..." Why? "as precautions to keep" pit bulls from being stolen by their owners (dogfighters) or others." This is an attribute of the breed?

"It is estimated that the power of the bite is twice that of other dogs." (And how was this estimated? And by whom?)

"Although the catch instinct derived from predation is present in other breeds of dogs it is remarkable in pit bulls." (If Clifford & Segrest ever attended a greyhound race, a lure course, a working terrier trial, a foxhunt or a coon hunt, they would find that one or two other breeds have a catch instinct.)

"Bigger dogs of other breeds are no match for pit bulls." (Oh yeah, then why are dogs fought at even weights?) "Their Dattraction to humans, 2) willingness to please and love of attention were consistently displayed. These attributes make unexpected attacks by some animals more devastating." (No doubt, but what attacks? When? Clifford & Segrest do not elaborate.)

"The phenomenal strength of pit bulls make them good contestants in pulling contests." (But the winners are usually cross-bred malamufces.)

In those instances where Clifford & Segrest give a source for their astounding statements, they usually reference books by Richard Stratton.

Mr. Stratton is a lay person whose public consists of men enthralled with a "macho" image. He tends to be as accurate in depicting the American Pit Bull Terrier in his books as **Mr. Terhune** was in depicting the collie. The difference is that Mr. Stratton is fascinated with aggression/- strength, agility and a dominant personality. His books are anecdotal and must be 'taken with the proverbial grain of salt. These books should not be used as a source in even a pseudo- scientific article. If Clifford and his co-author are not capable of seeing this, one must wonder how they can possibly leap to accurate judgments about approximately 1,000,000 dogs in the United States based on their observations of a handful of tormented individuals.

Clifford & Segrest conclude that "[a] ppearance alone is insufficient to differentiate the fighting strains from those bred as pets". I find it hard to understand how anyone could not differentiate a pet from the frenzied, bionic, schizoid, abused animal described by them.

When Clifford and his co-authors described their confiscated dogs, they refer to them as "fighting dogs." When they make generalisations, they refer to "pit bulls". "Pit bulls" are cited by them to mean such recognised and registered breeds such as the American Staffordshire terrier, the bull terrier, the Staffordshire bull terrier, and the American pit bull terrier. They offer no evidence that the "fighting dogs" they observed are of any one of these breeds other than a single statement that a "total of 3 recognised breeds were represented" among the 32 dogs seized in Ohio.

Registration figures for purebred dogs are an even poorer choice for background estimators. First, there are a number of registries, the American Kennel Club (AKC), being the largest and best known. All or almost all "pit bulls", are registered with either the United Kennel Club or the American Dog Breeders' Association or both; "pit bulls" are not eligible for registration with the American Kennel Club. In addition, there are the Universal Kennel Club, the Worldwide Kennel Club, the United States Kennel Club and numerous breed registries. The United Kennel Club, the American Dog Breeders' Association and a majority of these other-kennel clubs are privately owned and operated businesses; their registration figures are proprietary information and not available. Some dogs are registered with more than one kennel club; many dogs, even purebred, are not "registered at all. Even within the AKC, it is estimated that only 50% of all dogs eligible are registered (Gerald Hubbard, Dog World, May 1984, pp'12ff). The American Kennel Club is the only body that regularly publishes registration figures, but these are for the nation as a whole.

Second, these figures are REGISTRATIONS, they are not the number of dogs in the country.' Smaller dogs tend to live longer than larger dogs, so by using these numbers to indicate the relative numbers of dogs by breed, smaller dogs are under-represented and large breeds, over-represented. In addition, the number of dogs by-breed varies absolutely and relatively within regions of the country. The AKC makes yearly adjustments to its point schedule for championship to accommodate this fact [AKC Gazette July 1984, pp 80-81]. Thus, American Kennel Club registration figures may be the poorest possible choice for estimating breed populations within a region.

The only reliable way to estimate the relative frequency of breeds within an area is by survey or a complete census. A trained observer or observers must visit all or a carefully selected sample of homes and inspect and classify each family's dog as to breed. Even then, stray and abandoned dogs will go uncounted. The "pit bull" is any one of a group of dogs of great diversity and rather unremarkable features. Many medium-sized shorthaired dogs are just ordinary, mixed-breed dogs. But when they bite, they become "PIT BULLS". Thus it is imperative that the same criteria be used to identify dogs surveyed as are used to identify dogs that bite.

The foregoing are the difficult steps in any study; they must be done carefully, consistently and as completely as possible. Once we have determined all dog bites and the breed of the dog involved and the relative frequency of the breeds in the area in question, it is a fairly simple matter to estimate propensity to bite. If 20% of all dog bites are caused by "pit bulls" and 10% of all the dogs in the area are "pit bulls", then we can conclude that "pit bulls" are twice as likely to bite as we would expect. However, if 50% of all the dogs in the area are "pit bulls", then we must conclude that "pit bulls" are two and half times LESS likely to bite than other breeds. From this it can be seen how important it is to have sound, accurate figures on the overall breed frequencies. Simple statistical tests can tell whether the differences seen may be due simply to chance.

If we conclude yes, that the "pit bull" is more likely to bite than other breeds, the next question which must be answered is whether this is due the inherent nature of the breed or whether there may be some other explanation. This is the nature versus nurture question that has plagued geneticists, sociologists and other scientists for decades. Are there really racial differences in intelligence? Do two X chromosomes, as opposed to an X and Y, mean that a girl child will never be a mathematician? Are some people programmed from birth to be fat or do they just grow up eating too much? These are not easy questions to answer in humans and the similar question as to the inherent nature of the "pit bull" is no-less difficult to answer. "Pit bulls" being dogs, there is the advantage that one can design an experimental study with random allocation and uniform conditions of study. The disadvantage is that this is not an important enough question to warrant the allocation of resources to answer it.

If, for example, there is evidence that "pit bulls" are more likely to be trained or encouraged to bite by their owners, then banning the breed will not result in any fewer bites as these people can choose another breed or mixed-breed. In order to determine whether the propensity to bite is genetic, we have to compare breeds reared in identical situations. Puppies of various breeds must be raised under carefully controlled conditions and then tested in controlled environments for likelihood to attack or bite. Finally, there must be a sufficient number of puppies of each breed tested to ensure that the results have statistical validity.

There have been good studies on dog behaviour, but they are expensive and complicated. The "pit bull" and its propensity to bite has never been studied in a controlled situation.

' DR. CLIFFORD

Dr. Donald Clifford has a Doctor of Veterinary Medicine degree and a Ph.D. in veterinary medicine. His specialty is apparently veterinary surgery with primary interest in anesthesiology. He has been employed since 1971 by the Medical College of Ohio at Toledo as a Director of Laboratory Animal Medicine.

Dr. Clifford has expertise in veterinary surgery and laboratory animal care. There is no evidence that he has received any advanced training in animal behaviour or animal psychology, nor in epidemiology, genetics or population studies. He has several

publications regarding anaesthesia in animals and the one cited in JAVMA on observations in pit bulls.

Only publications in peer-reviewed journals are normally accepted as evidence of serious work in a field. Community Animal Control is NOT a peer-reviewed journal, nor, do I believe, is the Journal of the American Veterinary Medical Association.

He has no established basis for making claims that the "pit bull" is inherently different from other breeds. He has performed no scientific studies to demonstrate that assertion, nor has he cited such studies performed by other investigators. He has no basis for making claims that the "pit bull" bites more frequently than would be expected from its numbers in the population. Not only has he not performed such studies, he apparently has not even had the training to understand the requirements for such a study. That he would make broad and far-reaching claims outside his areas of expertise shows a lack of scientific and personal ethics.