Dog Bite Risk and Prevention: The Role of Breed

Literature Review

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Breeds Implicated in Serious Bite Injuries

In a range of studies, the breeds found to be highly represented in biting incidents were German Shepherd Dog,[1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,50] mixed breed,[1,4,6,8,10,11,12,19,17, 20,50] pit bull type,[5,9,13,16,21,20,22,23,24,25,26,27] Rottweiler,[15,18,22,24,25,28] Jack Russell Terrier,[21,25,26] and others (Chow Chow,[7,23] Spaniel,[14,26] Collie,[3,29] Saint Bernard,[20] and Labrador Retriever[2]).

If you consider only the much smaller number of cases that resulted in very severe injuries or fatalities,[21,23] pit bull-type dogs are more frequently identified. However this may relate to the popularity of the breed in the victim's community, reporting biases and the dog's treatment by its owner (e.g., use as fighting dogs[21]). It is worth noting that fatal dog attacks in some areas of Canada are attributed mainly to sled dogs and Siberian Huskies,[56] presumably due to the regional prevalence of these breeds. See Table 1 for a summary of breed data related to bite injuries.

Controlled Studies

The prevalence of particular dog breeds can also change rapidly over time, often influenced by distinct peaks of popularity for specific breeds. It seems that increased popularity is sometimes followed by increases in bite reports in some large breeds. For example there was a distinct peak in American Kennel Club registration of Rottweilers[30] between 1990 and 1995, and they come at the top of the list of 'biting breeds' for the first time in studies of bites causing hospitalization in the late 90s and early 2000s.[25,28,15,58] While it must be noted that other fad breeds such as Dalmatians and Irish setters do not seem to make similar appearances, any estimate of breed-based risk must take into account the prevalence of the breed in the population at the time and place of serious biting events.[17,31]

For example, researchers can compare well-documented bite cases with matched control households. Using this method, one study found that the breeds disproportionately involved in bite injuries requiring medical attention in the

Denver area (where pit bull types are not permitted) were the German Shepherd Dog and Chow Chow.[64]

Other studies use estimates of breed prevalence that do not relate specifically to the households where the bites occurred, such as general community surveys, breed registries, licensed dogs or animal shelter populations (See Table 2.). A study in Rome, Italy where *molloser* dogs like mastiff are reputed to be the most dangerous dogs, found they were not disproportionately involved in biting incidents when taking into account their prevalence in the community.[32] These prevalence referenced studies attribute higher risk to the German Shepherd Dog and crosses[60,61,62,63,64], and various other breeds (mixed breed,[62,63] Cocker spaniel,[61,65] Chow Chow,[64,65] Collie,[61] Doberman,[60] Lhasa Apso,[44,65] Rottweiler,[49] Springer Spaniel,[43] Shih Tsu,[43] and Poodle[62]).

Aggressive Breeds

Based on behavioral assessments and owner surveys the breeds that were more aggressive towards people were small to medium-sized dogs such as the collies, toy breeds and spaniels.[33,34,35,36,37] For example, a survey of general veterinary clientele in Canada (specifically practices in New Brunswick, Novia Scotia, and Prince Edward Island) identified Lhasa Apso, Springer spaniel and Shih Tsu as more likely to bite.[43]

While small dogs may be more aggressive their size means they are less likely to inflict serious bite injury except on vulnerable individuals or as part of a pack attack, which also allows dogs to seriously or injury healthy older children or adults.[38,39] Referrals for aggression problems more closely approximate the breeds implicated in serious bite attacks, probably because owners are more likely to seek treatment for aggression in dogs that are large enough to be dangerous. Larger dogs (regardless of breed) are implicated in more attacks on humans[40] and other dogs.[41]

Certain large breeds are notably under-represented in bite statistics such as large hounds and retrievers (e.g., Labrador Retrievers and Golden Retrievers)[35,43]—although even these breeds may have known aggressive subtypes.[42] Results relating to German Shepherd Dogs are mixed,[36,43] suggesting there may be particularly high variability in this breed, perhaps depending on regional subtypes or ownership factors.

Pit Bull Types

Owners of pit bull-type dogs deal with a strong breed stigma,[44] however controlled studies have not identified this breed group as disproportionately dangerous. The pit bull type is particularly ambiguous as a "breed" encompassing a range of pedigree breeds, informal types and appearances that cannot be reliably identified. Visual determination of dog breed is known to not always be reliable.[45] And witnesses may be predisposed to assume that a vicious dog is of this type.

It should also be considered that the incidence of pit bull-type dogs' involvement in severe and fatal attacks may represent high prevalence in neighborhoods that present high risk to the young children who are the most common victim of severe or fatal attacks. And as owners of stigmatized breeds are more likely to have involvement in criminal and/or violent acts[46]—breed correlations may have the owner's behavior as the underlying causal factor.

Breed Bans

Most serious dog bite injuries (requiring hospital treatment) in the United States are the victim being a young child[54] and the dog being un-neutered and familiar (belonging to the family, a family friend or neighbor).[32,47,48,54] Therefore responsible ownership and supervision is key to minimizing the risk of dog bites in communities.

While some study authors suggest limiting ownership of specific breeds might reduce injuries (e.g., pit bull type,[49] German Shepherd Dog[50]) it has not been demonstrated that introducing a breed-specific ban will reduce the rate or severity of bite injuries occurring in the community.[8,51] Strategies known to result in decreased bite incidents include active enforcement of dog control ordinances,[52] and these may include ordinances relating to breed.[53]

Conclusion

Maulings by dogs can cause terrible injuries[47] and death—and it is natural for those dealing with the victims to seek to address the immediate causes. However as Duffy et al (2008) wrote of their survey based data: "*The substantial within-breed variation…suggests that it is inappropriate to make predictions about a given dog's propensity for aggressive behavior based solely on its breed.*" While breed is a factor, the impact of other factors relating to the individual animal (such as training method, sex and neutering status), the target (e.g. owner versus stranger), and the context in which the dog is kept (e.g. urban versus rural) prevent breed from having significant predictive value in its own right. Also the nature of a breed has been shown to vary across time, geographically, and according to breed subtypes such as those raised for conformation showing versus field trials.[37]

Given that breed is a poor sole predictor of aggressiveness and pit bull-type dogs are not implicated in controlled studies it is difficult to support the targeting of this breed as a basis for dog bite prevention. If breeds are to be targeted a cluster of large breeds would be implicated including the German shepherd and shepherd crosses and other breeds that vary by location.

See Also:

National Animal Control Association Guideline Statement: "*Dangerous and/or vicious animals should be labeled as such as a result of their actions or behavior and not because of their breed.*"

Summary Tables

Table One
Studies of Serious Dog Bite Injury by Breed

Period	Data Source	N	Country	Top Two Breeds Identified	Ref
1971	US Dept. Health	843	United States (VA)	mixed breed German Shepherd Dog	1
1971-1974	Hospital records	50	South Africa	German Shepherd Dog Labrador Retriever	2
1973-1976	US Dept. Health	2618	United States (AL)	German Shepherd Dog Collie	3
1979-1982	Health Dept. Severe attacks	16	United States (SC)	pit bull type Saint Bernard	21
1981-1983	US Reservations	772	United States	mixed breed unspecified pedigree	19
1982	Hospital Records	420	Canada	German Shepherd mixed breed	54
1982-1989	Hospital records	146	United Kingdom	pit bull type Jack Russell Terrier	22
1987-1988	HASS	487	United Kingdom	mixed breed German Shepherd Dog	4
1979-1998	Fatalities	27	United States	pitt bull type Rottweiler	23
1969-2007	Fatalities	5	New Zealand	pitt bull type --	55
1989	Hospital records	168	United States	German Shepherd Dog pit bull type	5
1989	Hospital records	75	United Kingdom	German Shepherd Dog mixed breed	6

1991	Animal control records	357	United States	German Shepherd Dog Chow Chow	7
1991+1994	Hospital records	198	United Kingdom	German Shepherd Dog mixed breed	8
1989-1996	Hospital records	1109	United States (CA)	pit bull type German shepherd	9
1990-2007	Fatalities	28	Canada	mixed breed husky "sled dog"	56
1995	Patients receiving rabies post-exposure prophylaxis	~8000	United States (PA)	German Shepherd Dog mixed breed	10
1991-2000	Hospital records	654	Spain	German Shepherd Dog mixed breed	11
1996	Hospital records	1916	Australia	German Shepherd Dog Bull Terrier	57
1995-1997	Animal control	?	United States	pit bull type Chow Chow	24
1997	Hospital records	385	Canada	German Shepherd Dog Cocker Spaniel	11
1998-2002	Hospital records	72	Canada	Rottweiler German Shepherd Dog	58
2002	Accident compensation claims	535	New Zealand	Mixed breed German shepherd dog	17
1991-2004	Hospital records	25	South Africa	pit bull type German Shepherd Dog	59
1994-2005	Hospital records	341	Austria	mixed breed German Shepherd Dog	12
1997-2003	Hospital records	11	United States	Rottweiler German Shepherd Dog	15
2001-2002	ACC claims	3020	New Zealand	German Shepherd Dog pit bull type	13
2000-2004	Hospital records	593	United Kingdom	Rottweiler Jack Russell Terrier	28
2001-2005	Hospital records	551	United States	pit bull type Rottweiler	25
2002-2005	Veterinary referral	111	United States (PA)	Springer Spaniel German Shepherd Dog	14
2004-2005	Survey based on Dog Bite Line contacts	234	Ireland	Collie Spanie	29
2001-2011	Hospital records	436	United Kingdom	Staffordshire Bull Terrier Jack Russell Terrier	27
2000-2012	Hospital records	431	Switzerland	German Shepherd Dog Rottweiller	18
2005-2009	Hospital records	40	United States (SC)	Pit bull type Rottweiler	26
2006-2009	Hospital records	203	United States (PA)	Mixed breed Pit bull type	20

Table Two

Studies of Serious Dog Bite Injury by Breed taking into Account Breed Prevalence

Period	Data Source	Prevalence estimate	N	Country	Breeds Identified as Higher Risk	Ref
1974-1975	Animal control	Licensed dogs	?	United States (MD)	German Shepherd Dog and shepherd crosses Doberman Pinscher	60
1976-1977	US Bases	Relative risk versus mixed breed	529	United States (IL, MO)	Collie German Shepherd Dog Cocker Spaniel	61
1982	Pediatric practice	Non-biting pets of other patients	194	United States (MO)	German Shepherd Dog and shepherd crosses mixed breed over 30lb Poodle	62
1986-1987	Health Unit	Licensed dogs	318	Canada	German Shepherd Dog mixed breed	63
1991	Plastic surgery cases	Prevalence in community	146	Australia	German Shepherd Dog	50
1991	Animal control	Case controls	178	United States (CO)	German Shepherd Dog Chow Chow	64
1990-1993	Hospital records	Survey	356	Australia	Doberman Pinscher German Shepherd Dog Rottweiler	49
1993	Shelter animals quarantined for biting	General shelter admissions	170	United States (WI)	Chow Chow Cocker Spaniel Lhasa Apso	65
1996	Owner self-report (biters)	Owner self-report (non-biters)	3226	Canada	Lhasa Apso Springer Spaniel Shih Tsu	43
2003-2004	Shelter and Veterinary Hospital records	Registered dogs	290	Italy	Shepherd breeds	32

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