Journal of Veterinary Behavior (2006) 1, 17-22

ELSEVIER

Journal of
Veterinary Behavior
Clinical Applications
and Research

REVIEW

Breed-specific legislation and the pit bull terrier: Are the laws justified?

Stephen Collier, PhD

From the School of Human and Environmental Studies, University of New England, Armidale, NSW 2351, Australia.

KEYWORDS:
legislation;
pit bull;
dangerous dogs;
Australia

After more than a century as an uncontroversial dog (Jessup, 1975), the American pit bull terrier has developed a notorious reputation as a dangerous breed since 1980, with consequent restrictions placed upon it by jurisdictions in Australia and elsewhere. Studies in the United States have indicated that the "pit bull" is responsible for a significant number of human fatalities resulting from dog attack, but the data on which such studies are based are flawed by methodological shortcomings. Using absolute numbers of dog attacks by breed in Australia, data on attacks on human beings reveal the pit bull terrier to be exceeded by several other breeds. Regardless, the primary problem is that reliable data do not exist for the number of attacks relative to breed population. Of 19 human fatalities in Australia over the past two decades, none has involved a dog verified to be an American pit bull terrier. The evidence does not sustain the view that this is a uniquely dangerous breed, and breed-specific laws aimed to control it have not been demonstrated by authorities to be justified by its attack record.

Introduction

Dogs are kept by approximately 40% of Australian households, with one dog for every 5 people in the nation (Australian Companion Animal Council, 2003). Pet dogs confer many benefits upon their owners and are a source of great emotional satisfaction to a large number of people. Dogs can also be a threat to the community, in that dog bites to people are reported to enforcement and medical personnel annually. A small number of the reported attacks causes very serious human injuries, with fewer yet causing fatalities (Ozanne-Smith et al., 2001). Dog attacks represent a significant public safety issue that needs to be addressed by state and local governments.

Address reprint requests and correspondence: Stephen Collier, School of Human and Environmental Studies, University of New England, Armidale, NSW 2351, Australia.
E-mail: scollier@une.edu.au

1558-7878/$ -see front matter © 2006 Elsevier Inc. All rights reserved.
doi:10.1016/j.jveb.2006.04.011

Breed-specific approaches to dog control

Many jurisdictions in Australia and elsewhere have introduced breed-specific laws aimed at the restriction or ownership ban of breeds deemed to be dangerous to people. Such an approach may be based upon either of two beliefs: (1) that the breed in question has a record of bite frequency that supports the view that the breed shows a high level of aggression toward people; and (2) that the breed has a potential to be dangerous because of its physical characteristics and its functional history.

In Australia, only one breed for which a numerically significant population exists has been subjected to breed-specific controls: the American pit bull terrier (APBT). Restrictions on this breed were imposed by the Commonwealth in 1991 largely on the basis of the second belief, relating to its dangerous potential (Griffiths, 1991). Concurrently, the Dangerous Dogs Act [1991] had just been passed in the United Kingdom after a couple of very serious dog attacks attributed to APBTs. In both Australia and in Britain, the breed was introduced to the pubic by the media with

lurid and sensational accounts of its background, capabilities, and character (The Economist, 1987, 1991; Fielding, 1991). This character, once given, has set solidly in the minds of the public, the media themselves, and authorities at various levels of government. Cohen and Richardson (2002) have analysed the media's shortcomings in professionalism in their creation of the pit bull's reputation, and their analysis is as valid for Australia as it is for America. It is noteworthy that in 1991, when the Commonwealth import ban was announced, there had been no recorded attacks upon people by APBTs in Australia, whereas dog attacks in general were, as now, a considerable menace to public safety.

This trend has continued. In 1998, the New South Wales (NSW) state government introduced breed-specific restrictions of a minor kind on the APBT, and on the other three breeds banned from import by the Commonwealth (Companion Animals Act 1998). Laws were enacted in 2006 requiring the desexing or neutering of all APBTs, their strict confinement at home, and the muzzling and leashing of them when outside the home. In 2001 the governments of both Victoria and Queensland introduced harsh restrictions, and in 2005 Victoria further toughened its laws and, for the first time, Western Australia introduced restrictive laws against the APBT, which included compulsory desexing or neutering. The aim of these laws is to eventually eliminate the breed. In all Australian states, these measures were announced during periods of intense news media focus upon the "dangerous dog" issue occasioned by a number of serious attacks, especially upon children. Although public submissions were called for before the early legislation was drafted, no attempt was made by the relevant ministers or premiers to justify the measures using data on frequency and severity of dog bites by breed. This omission was corrected in NSW in 2005, when the Minister for Local Government used his department's dog attack data to justify measures against the APBT. As will be shown in the following paragraphs, the statistic used had little validity.

The dog attack data

Breed-specific legislation (BSL) in Australia has been enacted on the basis of the APBT's reputation and beliefs that it is a dangerous breed. As discussed previously, that belief can come from assumptions about the breed's attack record or about its aggressive potential. For any data on attacks to be used in BSL, it is necessary to calculate the population attributable fraction percentage (PAF%), which is a measure of the breed's impact on the overall population (Overall and Love, 2001). Often, PAF% is estimated from licensing records; however, these numbers may not reflect true breed distributions. Few examples of legislation exist that use PAF% in any form; however, the PAF% is the only valid measure of breed impact that would allow accurate construction of odds ratios for different breeds. Especially in this light, it would be reasonable for Australian parliaments to legislate on the basis of the situation in Australia, but the breed import ban was justified by the alleged record of the dogs in the United States and the United Kingdom (Griffiths, 1991). At first glance, data from the United States indicate that the "pit bull" is the country's most dangerous dog breed, and Sacks (2000) presents data showing that the "pit bull" and its crossbreeds accounted for approximately 32% of human dog attack fatalities between 1979 and 1998, for which the breed of the dog was known (238 deaths). This study updates an earlier one (Sacks et al., 1996) that, for the years 1989 through 1994, had "pit bulls" accounting for 22% of fatalities. A more thorough study by Delise (2002) revealed that "pit bulls" were responsible for 6.7% of human fatalities between 1965 and 2001. This percentage of fatal attacks, although seemingly high, may be proportionate to the breed's numbers relative to the US dog population, which by some estimates could be as high as 9.6% (ACF, 2002). Data obtained from a number of dog bite studies and sources in the United States over this time period were analyzed for breed effects, with 2 conclusions that are germane here: (1) common breeds are reported to bite more often; and (2) the data are almost never collected in a way that would allow accurate calculation of PAF% (Overall and Love, 2001). In the United States, approximately 380,000 APBTs are registered by the two major breed registries; the American Kennel Club has a total annual registration for its 150 breeds of approximately 960,000 (ACF, 2002).

Attack data are often seriously flawed with respect to collection, reporting, and analysis. In the United States, the term "pit bull" does not mean APBT: it is a generic term that includes all the bull and terrier breeds, and sometimes the other bull breeds such as boxers, bull mastiffs, American bulldogs (Rowan, 1987). Breed identification is seldom verified or consistent (Beck et al., 1975), and even experts cannot always tell whether a dog is a pit bull (Rowan, 1987). More seriously, breed identification often is based upon newspaper accounts.

Australia, like much of the rest of the world, lacks data on frequency of dog attacks by breed. Indeed, we do not have good data on the frequency of dog attacks, as is evidenced by the methodologies employed to estimate their numbers in the various published studies (Thompson, 1991, 1997; Van de Kuyt, 1999). "Dog bite" is not a notifiable injury, and although some hospitals and local councils record dog bites and sometimes assessment of the breed involved, others do not. In addition, an unknown, but probably high, proportion of attacks is treated by general practitioners or at home and never reported to a central authority. Reports may be biased toward attended bites or catastrophic bites, neither of which reflects any true pattern of dog bites, injury, and breed. Since 1997 the NSW Department of Local Government has required councils to report all dog attacks to the head office, which has resulted in only partial compliance. Nevertheless, these are the best

Table The leading breeds by numbers of attacks, numbers registered, and percentage of attacks by registered numbers

Breed	Number Involved in Attacks	Number of Breed Registered in NSW	% of Breed Reported as Having Attacked
German shepherd dog	63	35711	0.2
Rottweiler	58	23735	0.2
Australian cattle dog	59	28850	0.2
Staffordshire bull terrier	41	40776	0.1
American pit bull terrier	33	3244	1.0

NB: These data indicate that 200+ bites are attributable to other breeds.

data available in Australia, so their examination may prove enlightening.

The data from 1997 to 2000, inclusive, indicate that there were 829 injuries to people caused by dogs and reported to councils in NSW. The breeds identified as being responsible for the majority of attacks were crossbreeds, unknown breeds, cattle dog types, german shepherd types, and collie types. These records note that breed was not validated and, in most cases, breed identification was made by one of the people involved. Categories used to identify breeds cluster by type, rather than by specific breed, because breed identification is imprecise. In these reports, bull terrier "types" were most likely to attack other animals (NSW government, 2003). More recent data for the years 2001 through 2003 list 547 reported dog attacks on people in NSW, with APBTs responsible for 33 (4%) attacks, behind crossbreeds (182, or 32.7%), German shepherds (63, or 10.4%), cattle dogs (59, or 8.4%), and rottweilers (58, or 6.6%). When average severity of bites is considered, APBTs were sixth of the 6 breeds for which there were sufficient data for analysis (NSW government, 2003).

The latest and most comprehensive set of data has recently been reported for 2004 and 2005 by the Companion Animal Unit of the NSW Department of Local Government (NSW government, 2006). In the year July 2004 to June 2005, 873 dog attacks were reported to the department by 74 councils, or 49% of councils in NSW. These data include focus of attack (people or other animals); 54.9% of attacks were directed toward people, whereas 45.1% of the attacks were directed toward animals. In 95% of the attacks reported for people, there is no record of whether an injury occurred, but in 38 cases (4.4%), hospitalization was required.

The data on attacks on people indicate that 29 breeds of dog were involved in the attacks. Additionally, for each breed, the number of attacks, number of the breed registered in NSW, and percentage of the registered number as attacking are also reported. The data pertaining to the leading 5 breeds reported to be involved in attacks are presented in the Table.

These data have recently been used by the state minister in parliamentary debate to show that the APBT is 6 times more likely to attack than the Australian cattle dog, and to justify the legislation aimed to eventually eliminate the breed. The data do not warrant such interpretation, as a number of serious uncertainties and inaccuracies are involved. A brief discussion of relevant methodological problems follows.

The greatest flaw in this odds calculation is that not all dogs in the state, whether they bite or not, are registered. In short, the PAF% is unknown. The report reveals that 32.7% of attacking dogs are registered, with another 27.6% having unknown registration status. If attacking dogs are representative of dogs in general as to registration, at least 1/2 to 2/3 of the state's dogs are unregistered. Using the registered breed populations as the overall breed populations for the denominator to calculate breeds' attack rates lacks validity. Such a calculation assumes that each breed has the same proportion of registered and unregistered individuals, which almost certainly is not the case.

The aforementioned assumption also implies that that the owner population of each breed is demographically identical in relation to responsibility, attitude to dogs, level of care, compliance with regulations, and so on. One also has to assume that owners of all breeds are confident of receiving equal treatment from governments, which clearly is not the case in a climate of breed-specific laws. Although there are no Australian data, it may be a reasonable assumption, given the current legislative climate, that APBT owners are significantly less likely to register their dogs, or to register them as APBTs, than are dog owners in general. The author's contact with many APBT owners over 16 years substantiates this belief.

The reported data suggest that a small proportion of the state's APBTs are registered, as only 3244 are listed. The registry has 5137 American Staffordshire terriers (AST), yet it is widely believed, contrary to the published and avowedly incomplete data, that APBTs are far more common than ASTs. The report's data suggest that 1 in 100 APBTs attacked during the one year recorded. This is almost certainly an overestimate, but in the absence of accurate data, no appropriate figure can be suggested.

Although data are recorded for focus of attack (people or other animals), the target species is not recorded by breed. Less comprehensive Department of Local Government data for earlier years, reported previously, indicate that the bull terrier breeds are more likely to attack other animals than people, which further confounds attempts to assess the relative danger to people of the various dog breeds.

These injury figures may represent only a proportion of people bitten by dogs. Other studies of mixed methodology indicate much higher numbers of dog bites. In the 4 years between 1998 and 2001, 2232 people were treated for injuries sustained from dog bites in 5 Brisbane hospitals, more than double the whole NSW total for a similar period (Queensland government, 2002). Thompson (1991, 1997) estimated on the basis of injury data from Adelaide that as many as 30 000 people could be injured each year by dogs in Australia. This estimate highlights the lack of knowledge surrounding the whole issue of dog attacks in Australia. Thompson's Adelaide data record the following percentages of injuries caused by specific breeds: German shepherd 25.3%, bull terrier 13.6%, cattle dog 13.6%, Doberman 11.7%, and rottweiler 9.1%. Curiously, crossbreeds are not listed. Assessment of these figures requires data on numbers of attacks relative to breed population, and although Thompson has attempted to estimate these numbers, he uses Australian National Kennel Control (ANKC) breed registration figures as his denominator. Although this method produces unreliable data, it is likely that all the above breeds are overrepresented relative to their numbers in the community, if individual identifications were correct. Breeds again were identified by people involved in the attacks, so they are not verified or reliable.

The Victorian Bureau of Animal Welfare conducted a study of dog bites in public places between 1997 and 1999, inclusive (Van de Kuyt, 1999). The study included 6 municipalities and gathered data from reports of dog attacks in public places. A total of 413 injuries to people was recorded, and 20 (4.8%) were serious enough to require two or more sutures. There were 46 breeds (including crosses) cited as being responsible for the attacks: German shepherd 127 (30.8%), cattle dog 90 (21.8%), rottweiler 71 (17.2%), kelpie 40 (9.7%), Staffordshire bull terrier 40 (9.7%), bull terrier 37 (9.0%), crossbreed 35 (8.5%), Labrador 33 (8.0%), Doberman pinscher 26 (6.3%), boxer 26 /6.3%, Jack Russell 22 (5.3%), Rhodesian ridgeback 22 (5.3%), border collie 21 (5.1%), American pit bull terrier 21 / 5.1%. Another study of Victoria hospital presentations reported 1112 cases of dog bites in a two-year period, from January 1996 to December 1997 (Ashby et al., 1998). Breeds most commonly recorded in these attacks were kelpies, crossbreeds, border collie, fox terriers, cattle dogs, German shepherds, and Jack Russell terriers. These breeds may reflect the largely rural nature of the sample, with 71% of municipalities returning data. Such demographic data are essential if we are to understand societal implications of dog bites. As has been true with other studies, reliable data on breed populations are not available for this sample, so it is not possible to estimate which, if any, of these breeds are disproportionately represented in attacks.

An informal survey of dog bites by breed among Queensland councils was done by the Endangered Dog Breeds Association (EDBA) in 2001. Replies to enquiries were received from 19 councils, excluding Brisbane City and the Gold Coast. A total of 750 dog attacks was recorded for a 12-month period, and of those attacks, 3 were attributed to APBTs.

Separate data from the Gold Coast City Council area recorded 162 dog attacks, 3 (1.9%) of which were by APBTs. These data are supplemented by the register of dogs declared dangerous for an attack or other aggressive behaviour by the Brisbane City Council as of 1995. There were 751 dogs on the register with the following breeds predominant: cattle dogs 200 (26.6%), German shepherds 185 (24.6%), bull terriers 76 (10.1%), rottweilers 69 (9.2%), and kelpies 43 (5.7%), with 9 other breeds rounding out the list. Two of the dogs (0.3%) reported by breed were APBTs. It is inexplicable that no crossbreed dogs were on the register.

These various data indicate two things: a relatively small number of dog breeds contributes a large proportion of all attacks, and the APBT is not one of the breeds with the worst record for absolute numbers of attacks. The latest NSW data indicate that the APBT has a significantly worse attack record relative to its population than other breeds, but that calculation is questionable, as discussed previously. It may be claimed that APBTs do not cause a great number of injuries to people, but that the injuries they do inflict are very severe ones. It is true that a small number of serious injuries has been caused in Australia by APBTs. Although the news media give heavy coverage to some serious dog attacks, which they often attribute to APBTs, it often is not realized that an estimated 6 people are admitted to hospital every day in Queensland alone suffering from dog bites (Queensland government, 2002). Impressions of which dogs are most dangerous implanted by episodic news media stories are not very reliable or valid. In the last two decades or so there have been 19 human deaths caused by dog attacks in Australia; these data come from memory, newspaper clippings, and consultations with people in the pet and animal welfare institutions. A variety of breeds and crossbreeds was involved, but not one fatality was caused by an APBT.

Potential to be dangerous

It is a truism that all dogs can bite and that dogs of any breed can be dangerous. Indeed, American records (Lockwood, personal communication, 2006) indicate that several toy breeds have killed infants, and a recent unpublished Australian study recorded very serious injuries to children inflicted by toy breeds (Ryan, 2002). However, it often has been claimed that the APBT and other "fighting" breeds are especially dangerous because of human breeding selection for physical and "temperamental" traits functional in pit fighting (Budiansky, 2001). Although some APBT have been under selection for dog fighting traits, it has also been under complementary selection for stability and tractability with people. As is true for any medium-sized and powerful dog, the APBT has the potential to be dangerous, but there

is no specific research to demonstrate that breeds with a fighting past are more aggressive toward people than other dogs.

Discussion

APBTs, like all dogs, given their behavioural plasticity, can be made aggressive by human agency, either unwittingly or deliberately. It is this process of selection that has created all breeds. Some dogs may be aggressive for genetic or developmental reasons. The question to be considered by policy makers is whether APBTs and other breeds exhibit sufficient frequency of aggression to justify breed-specific laws against them. If a half dozen dog breeds are responsible for 60% to 70% of attacks on people, it may seem a reasonable public safety measure to place restrictions upon those breeds. However, if only a small minority of individuals within the breeds ever attacks, is it reasonable to penalize the whole breed? Does doing so make us safer? This is a matter for judgement, and many jurisdictions have concluded that it is reasonable, given the primacy of public safety. However, Australian jurisdictions that have introduced BSL have singled out the APBT, which is not one of the most commonly biting dogs, and have not acted against the breeds that are. This is a questionable strategy if the objective is to reduce the number of dog attacks.

BSL rightly should proceed from a clear assessment of the threat posed by breeds, and not from the actions of a few individual dogs, horrific as they may be. Little consideration has been given to what is meant when a dog is said to be dangerous, though Kelly (2001, 2003) addressed this complex issue. Even in the absence of PAF% data, a case can be made from the above attack data that some breeds are relatively more frequently involved in attacks than are others. However, the data show that those breeds contain a minority of aggressive individuals, or individuals that react with aggression in certain circumstances. It currently is not possible to quantify accurately proportions of aggressive individuals within breeds, but the data in the Table indicate a figure ranging from 1 in 100 to 1 in 1000 for the 5 worst breeds. It is a matter of judgement as to what proportion would condemn a breed as dangerous.

In view of this fact, a more defensible and promising approach may be to declare dangerous individual dogs that have caused problems, a facility that exists in most states' legislation. BSL may be justified and acceptable policy if it works to reduce significantly the number of dog attacks. There is no evidence from Australia or elsewhere that it does so. Indeed, the rate of dog attacks has not declined since the introduction of BSL. Hospital admissions for dog bites in the UK have increased by 25% over the last 5 years (BBC, 2002), and there was no decline in attacks in the 2 years following the introduction of the DDA in 1991 (Klaassen et al., 1996). South Australia has had BSL restrictions on the APBT since 1995, but it has never had a serious attack by the breed, before or since that date (Kelly, 2003).

Conclusions

Dog attacks are a significant public safety issue in Australia, as elsewhere. However, a tiny minority of the 4 million dogs in our communities bite people in any given year (NSW government, 2003, 2006). The available data show clearly that some crossbreeds and a small number of breeds are responsible for a large proportion of attacks, but the inclusion of individual breeds varies as they wax and wane in popularity, and crossbreeds lead the list of attacks, certainly in NSW. The APBT is well down the lists of absolute numbers of attacks by breed, and the case that it is an especially dangerous dog is not established. At worst, if the recent NSW data are taken at face value, the APBT is twice to 10 times more likely to attack than other listed breeds, but even then only 1% of individuals attack in any way a person or other animal in a given year. It is questionable whether laws to extirpate a breed can be justified when, by the worst case data, 90% of its individuals are not recorded to attack a person or animal over their life span. Breed-specific laws singling out this dog cannot produce significant reductions of dog attacks, as it is responsible for only 3.8% of reported cases in NSW and similar percentages in other states. BSL directed against the group of breeds with the worst bite records would be unlikely to affect bite frequencies for long, as even with rigorous and effective enforcement, there are many other breeds' individuals of which irresponsible owners could render dangerous (Jessup, 1995, Beer, 2002).

Acknowledgments

I would like to thank the Director General and the Companion Animal Unit of the NSW Department of Local Government for use of their dog attack data for the years from 1997 to 2005.

References

American Canine Foundation, 2002. Available at: http://legislation2002.tripod.com/washingtonanimalfoundationinc/ based upon annual APBT registration data from the United Kennel Club (http://www.ukc-dogs.com/) and the American Dog Breeders Association (http://www.adba.cc/), the two largest registries for the APBT.

Ashby, K., Routley, V., Stathakis, V., 1998. Enforcing legislative and regulatory injury prevention strategies. Hazard. Edition 34, Victorian Injury Surveillance System, Monash University Accident Research Centre.

Australian Companion Animal Council, 2003. Contribution of the pet care industry to the Australian economy (5th Ed.).

Beck, A.M., Loring, H., Lockwood, R., 1975. The ecology of dog bite injury in St. Louis, Missouri. Public Health Reports 90, 262-266.

Beer, A., 2002. Man's best friend or dangerous dog? [Radio] BBC. 1 July. Available at: http://news.bbc.co.uk/1/hi/programmes/4x4_reports/2077040.stm.

Budiansky, S., 2001. The Truth about Dogs. Phoenix, London.

Cohen, J., Richardson, J., 2002. Pit bull panic. Journal of Popular Culture 36(2), 285-302.

Delise, K., 2002. Fatal Dog Attacks: the Stories Behind the Statistics. Anubis Press, Manorville, NY.

Economist Staff Writer. 1987 Cave canem. The Economist, 29 August. London.

Economist Staff Writer, 1991. Killer genes ate my dog. The Economist. 1 June, 83.

EDBA / Endangered Dog Breeds Association. Available at: http://www.edba.org.au/.

Fielding, N., 1991. Barker's bark. New Statesman and Society. 4, 18-19, 31 May.

Griffiths, A., 1991. Commonwealth Minister for Resources. Media Releases 13 June and 25 November.

Jessup, D., 1995. The Working Pit Bull. TFH Publications, Neptune City, NJ.

Kelly, D., 2001. The need for a national policy direction for aggressive dogs. Urban Animal Management: Proceedings of the 11th National Urban Animal Management Conference, Australian Veterinary Association.

Kelly, D., 2003. Statement in discussion to the 13th National Urban Animal Management Conference, Coloundra, Queensland, 20-22 August 2003.

Klaassen, B., Buckley, J., Esmail, A., 1996. Does the Dangerous Dogs Act protect against animal attacks: a prospective study of mammalian bites in the accident and emergency department. Injury 27, 89-91.

Lockwood, R., 2003. Humane Society of the United States, raw data records of dog bite fatalities supplied by Dr Randall Lockwood to Stephen Collier. NSW Department of Local Government. Available at: www.dlg.nsw.gov.au/.

NSW Department of Local Government. Reported Dog Attacks in NSW July 2004–June 2005. Companion Animal Unit, NSW, 2006.

Overall, K.L., Love, M., 2001. Dog bites to humans—demography, epidemiology, injury, and risk. J. Am. Vet. Med. Assoc. 218, 1923-1934.

Ozanne-Smith, J., Ashby, K., Stathakis, V.Z., 2001. Dog bite and injury prevention analysis, critical review, and research agenda. Injury Prevention. 7, 321-326.

Queensland Injury Surveillance Unit. Dog bites, June 2002. Available at: www.qisu.qld.gov.au.

Rowan, A.N. (ed.), 1987. Dog Aggression and the Pit Bull Terrier. Tufts University School of Veterinary Medicine, North Grafton, MA.

Ryan, S., 2002. Dangerous dog attacks near home. Courier Mail. 3 August. Brisbane.

Sacks, J.J., Lockwood, R., Hornreich, J., 1996. Fatal dog attacks. Pediatrics. 97, 891-895.

Sacks, J.J., Sinclair, L., Gilchrist, J., Golab, G., Lockwood, R., 2000. Breeds of dogs involved in fatal human attacks in the United States between 1979 and 1998. J. Am. Vet. Med. Assoc. 217, 836-840.

Thompson, P.G., 1991. Dog attacks. Injury Surveillance Monthly Bulletin, South Australian Health Commission. pp. 291-292.

Thompson, P.G., 1997. The public health impact of dog attacks in a major Australian city. Med. J. Aust. 167, 129-132.

Van de Kuyt, N., 1999. Dog attacks in public places. Bureau of Animal Welfare, Attwood, Victoria.