



Word cloud of the frequency of breeds identified in serious dog bite injuries in a 4-year review of 1616 consecutive dog bite injuries treated at Children's Healthcare of Atlanta (CHOA), a level I trauma center.

Opposition to Senate Bill 107

Local Government and Elections Committee

Missouri Senate

February 24, 2021

Written Testimony by DogsBite.org

Source of graphic:

Golinko MS, Arslanian B, Williams JK, Characteristics of 1616 Consecutive Dog Bite Injuries at a Single Institution, *Clinical Pediatrics (Phila)*, April 2017;56:316–325 [July 2016, Epub].

Written Testimony by DogsBite.org

DogsBite.org is 501(c)(3) nonprofit organization established in 2007 and incorporated in 2009, becoming the first national dog bite victims' organization in the United States dedicated to reducing serious dog attacks.

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O'Brien DC, Andre TB, Robinson AD, Squires LD and Tollefson TT, [Dog bites of the head and neck: an evaluation of a common pediatric trauma and associated treatment](#), *Am J Otolaryngol*, 2015 Jan-Feb; 36(1): 32–38. [2014 Sep 28, Epub].

Bini JK, Cohn SM, Acosta SM, McFarland MJ, Muir MT, Michalek JE; TRISAT Clinical Trials Group, [Mortality, Mauling, and Maiming by Vicious Dogs](#), *Ann Surg*, April 2011;253:791-797.

Chen HH, Neumeier AT, Davies BW and Durairaj VD, [Analysis of Pediatric Facial Dog Bites](#), *Craniofacial Trauma Reconstr*, Dec; 6(4): 225–232 [Sept 2013, Epub].



DogsBite.org

DogsBite.org is a national dog bite victims' group dedicated to reducing serious dog attacks. Through our work, we hope to protect both people and pets from future attacks. Our website contains a wide collection of data to help policy-makers and citizens learn about dangerous dogs. Our research focuses on pit bull type dogs. Due to selective breeding practices that emphasize aggression and tenacity, this class of dogs negatively impacts communities the most.

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Summary of Key Peer-Reviewed Medical Studies (2011-2020)

Over the last nine years, 14 peer-reviewed retrospective medical studies from Level 1 trauma centers spanning all major geographical regions in the United States—Northeast, Southeast, South, Southwest, Midwest, West Coast and Northwest—all report similar findings.¹ Pit bulls are inflicting a higher prevalence of injuries than all other breeds of dogs. The majority of these studies (12 of 14) also report that pit bulls are inflicting the most severe injuries, requiring a higher number of operative interventions—up to five times higher—than all other dog breeds.

Four additional studies from this period, all from Level 1 trauma centers in the Denver metro area, show a mixture of results, likely due to Denver and the surrounding metropolitan regions enforcing pit bull bans for the last three decades.²

For brevity we are summarizing five of these studies. The first, Dog-Bite Injuries to the Craniofacial Region: An Epidemiologic and Pattern-of-Injury Review at a Level 1 Trauma Center, is a 10-year review (2009-2018) of all facial and associated injuries from a regional Level 1 trauma center in West Virginia, Charleston Area Medical Center, the state’s largest hospital. The study included 182 patients and found that pit bulls inflicted the most complex wounds, 63%, the most mauling injuries, 71%, and the most fractures, 47%, within the top-biting breeds. Furthermore, pit bulls were 2.7 times more likely to attack off property and often attacked unprovoked.

“The data showed that compared with other dog breeds, pit bull terriers inflicted more complex wounds, were often unprovoked, and went off property to attack ... The probability of a bite resulting in a complex wound was 4.4 times higher for pit bulls compared with the other top-biting breeds ... and the odds of an off-property attack by a pit bull was 2.7 times greater than that for all other breeds.”

The second study, Characteristics of 1616 Consecutive Dog Bite Injuries at a Single Institution (2017), is a 4-year review of Children’s Healthcare of Atlanta, the only pediatric Level 1 trauma center in Georgia. The large-scale study included 1616 pediatric patients and concluded that “operative intervention was more than 3 times as likely to be associated with a pit bull injury than with any other breed” and that “pit bull breeds were more than 2.5 times as likely as other breeds to bite in multiple anatomical locations.” Their findings showed that compared to other dog breeds, pit bulls inflicted a higher frequency of injuries and pit bull injuries were more severe.

“Our data were consistent with others, in that an operative intervention was more than 3 times as likely to be associated with a pit bull injury than with any other breed. Half of the operations performed on children

in this study as well as the only mortality resulted from a pit bull injury. Our data revealed that pit bull breeds were more than 2.5 times as likely as other breeds to bite in multiple anatomical locations ... Our data confirm what detractors of the breed and child advocates suggest—that, with rare exceptions, children and pit bulls do not mix well.”

The third study, Dog Bites of the Head and Neck: An Evaluation of a Common Pediatric Trauma and Associated Treatment (2015), is a review of 334 dog bite cases from the University of California Davis Medical Center, a Level I trauma center in Sacramento. The study found that pit bulls inflicted a higher frequency of injuries and a higher severity of injuries—had 5 times the relative rate of surgical intervention—compared to other dog breeds. The study also concluded that, “pit bull terriers were significantly more likely to bite a patient without provocation” and were “more likely to bite a stranger without provocation.”

“334 unique dog bites were identified, of which 101 involved the head and neck ... Of the more than 8 different breeds identified, one-third were caused by pit bull terriers and resulted in the highest rate of consultation (94%) and had 5 times the relative rate of surgical intervention. Unlike all other breeds, pit bull terriers were relatively more likely to attack an unknown individual, and without provocation.”

The fourth study, Mortality, Mauling, and Maiming by Vicious Dogs (2011), is a retrospective review of 228 dog bite patients admitted to the Level I trauma center at University Hospital San Antonio from 1994 to 2009 and treated by the Trauma and Emergency Surgery Service. The examination of these cases showed that compared to attacks by other breeds of dogs, attacks by pit bulls were associated with a higher median Injury Severity Scale score, a higher risk of an admission Glasgow Coma Scale score of 8 or lower (≤ 8 = severe head or brain injury), higher median hospital charges and a higher risk of death.

“Conclusions: Attacks by pit bulls are associated with higher morbidity rates, higher hospital charges, and a higher risk of death than are attacks by other breeds of dogs. Strict regulation of pit bulls may substantially reduce the US mortality rates related to dog bites.”

“The attack pattern of pit bulls is different from that of other dogs. With other dogs, children are usually at highest risk of being bitten. In contrast, pit bulls seem to attack adults almost as frequently as they attack children. Pit bulls not only are notorious for their indiscriminate attack pattern but also are well known for the tenacity with which they continue with an attack.”

Breed-Specific Findings in Peer-Reviewed Literature

During this same 9-year period, there were also four peer-reviewed Level 1 trauma studies from the Denver region, including a large-scale pediatric study carried out at Colorado Children’s Hospital, published in 2013. The study involved 537 patients during the years of 2003 to 2008. Over a decade earlier, in 1989, Denver enacted a pit bull ban. No one is surprised that findings in the Denver region are different than the rest of the country. The pediatric study found a lower prevalence of pit bull injuries compared to other dog breeds. The study states in part:

“Pit bulls were banned in Denver because of several gruesome maulings and fatalities that occurred between 1984 and 1989. Our study found 11 victims of pit bull bites from 2003 to 2008, including the patient who suffered the most extensive injuries and the longest hospitalization.”

The prevalence of pit bull injuries was lower in Denver due to the ban, but the **severity of injury** when a pit bull was involved in an attack remained the same.

The primary reason why local governments choose to adopt breed-specific laws is to prevent damaging and disfiguring attacks by breeds of dogs, chiefly pit bulls, which have well identified severe injury risks, as well as fatal injury risks.

From a national perspective, Denver is the “**control factor**” in all of these 18 studies. Furthermore, in a 2017 meta-study published in the *Journal of the American Society of Plastic Surgeons*, they reviewed all peer-reviewed dog bite studies in the United States from 1958 to 2016.³ Part of their findings include:

“Since 2001, Pit Bull type breeds have accounted for the largest subset of dog bites reported in the medical literature (37.5%) ... In addition to these findings, we evaluated the effectiveness of breed specific legislation in Denver, CO, the largest jurisdiction in the United States with a pit bull ban in place. Since 2001, 5.7% of bites in Denver, CO were attributed to Pit Bull type breeds compared to 54.4% in the remainder of the United States.”

Only 5.7% in Denver versus 54.4% in the remainder of the U.S.

The authors also state: “To our knowledge, this is the first systematic review devoted to breed responsible for severe dog bites in the peer-reviewed literature, as well as the first report evaluating breed specific legislation in the United States. Our data suggest that breed specific legislation may be effective in reducing the incidence of dog bites attributed to breeds that are regulated.”

End Notes

¹ **West Virginia** - Khan K, Horswell B and Samanta D, [Dog-Bite Injuries to the Craniofacial Region: An Epidemiologic and Pattern-of-Injury Review at a Level I Trauma Center](#), *J Oral Maxillofac Surg*, March 2020 [2019 Nov 14, Epub].

Texas - Abraham JT, Czerwinski M, [Pediatric Dog Bite Injuries in Central Texas](#), *Journal of Pediatric Surgery*, July 2019 [2018 Oct 31, Epub].

California - Lee, Christine J, Santos, Pauline Joy F, Vyas, Raj M, [Epidemiology, Socioeconomic Analysis, and Specialist Involvement in Dog Bite Wounds in Adults](#), *J Craniofac Surg*, May 2019;30(3):753-757.

Ohio - Essig G, Sheehan C, Rikhi S, Elmaraghy C and Christophel J, [Dog Bite Injuries to the Face: Is There Risk with Breed Ownership? A Systematic Review with Meta-Analysis](#), *International Journal of Pediatric Otorhinolaryngology*, Volume 117, February 2019.

California - Brice J, Lindvall E, Hoekzema N, Husak L, [Dogs and Orthopaedic Injuries: Is There a Correlation to Breed?](#), *J Orthop Trauma*, 2018 Sep;32(9):e372-e375.

Arkansas - Smith AM, Carlson J, Bartels AB, McLeod CB and Golinko MS, [Characteristics of Dog Bites in Arkansas](#), *South Med J*, 2018 Aug;111(8):494-500.

New York - Alizadeh, K, Shayesteh, A, Xu, ML, [An Algorithmic Approach to Operative Management of Complex Pediatric Dog Bites: 3-Year Review of a Level I Regional Referral Pediatric Trauma Hospital](#), *Plast Reconstr Surg Glob Open*, October 2017.

Georgia - Golinko MS, Arslanian B, Williams JK, [Characteristics of 1616 Consecutive Dog Bite Injuries at a Single Institution](#), *Clinical Pediatrics (Phila)*, April 2017;56:316-325 [July 2016, Epub].

Washington - Prendes MA, Jian-Amadi A, Chang SH and Shaftel SS, [Ocular Trauma From Dog Bites: Characterization, Associations, and Treatment Patterns at a Regional Level I Trauma Center Over 11 Years](#), *Ophthalmic Plast Reconstr Surg*, 2016 Jul-Aug;32(4):279-83 [June 2015, Epub].

Tennessee - Foster MD and Hudson JW, [Contemporary Update on the Treatment of Dog Bite: Injuries to the Oral and Maxillofacial Region](#), *J Oral Maxillofac Surg*, May 2015 Volume 73, Issue 5, Pages 935-942.

Arizona - Garvey EM, Twitchell DK, Ragar R, Egan JC and Jamshidi R, [Morbidity of pediatric dog bites: A case series at a level one pediatric trauma center](#), *J Pediatr Surg*, February 2015;50:343-6.

California - O'Brien DC, Andre TB, Robinson AD, Squires LD and Tollefson TT, [Dog bites of the head and neck: an evaluation of a common pediatric trauma and associated treatment](#), *Am J Otolaryngol*, 2015 Jan-Feb; 36(1): 32-38. [2014 Sep 28, Epub].

West Virginia - Horswell BB and Chahine CJ, [Dog Bites of the Face, Head and Neck in Children](#), *WV Med J*, Nov-Dec 2011.

Texas - Bini JK, Cohn SM, Acosta SM, McFarland MJ, Muir MT, Michalek JE; TRISAT Clinical Trials Group, [Mortality, Mauling, and Maiming by Vicious Dogs](#), *Ann Surg*, April 2011;253:791-797.

² **Denver** - Kumar R, Deleyiannis FW, Wilkinson C and, O'Neill BR, [Neurosurgical sequelae of domestic dog attacks in children](#), *J Neurosurg Pediatr*, January 2017:24-31 [Epub 2016 Oct 21].

Denver - Gurunluoglu R, Glasgow M, Arton J and Bronsert M, [Retrospective analysis of facial dog bite injuries at a Level I trauma center in the Denver metro area](#), *J Trauma Acute Care Surg*, 2014 May;76(5):1294-300.

Denver - Chen HH, Neumeier AT, Davies BW and Durairaj VD, [Analysis of Pediatric Facial Dog Bites](#), *Craniofacial Trauma Reconstr*, Dec; 6(4): 225-232 [Sept 2013, Epub].

Denver - Wei LA, Chen HH, Hink EM, Durairaj VD. [Pediatric facial fractures from dog bites](#). *Ophthalmic Plast Reconstr Surg*. 2013 May-Jun;29(3):179-182.

³ Bailey C, Hinchcliff K and Pu L, [Abstract: A Review of Dog Bites in the United States from 1958 to 2016: Systematic Review of the Peer-Reviewed Literature](#), *Plastic and Reconstructive Surgery - Global Open*, 2017 Abstract Supplement, Presentations at the American Society of Plastic Surgeons' Annual Meeting: Plastic Surgery The Meeting 2017, 2017 Sep; 5(9 Suppl): 172-173.