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Child Death Review Programme

Rapid review of deaths of children from dog bites or strikes

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Purpose and Summary of Document:

This rapid review of child deaths from dog bites or strikes uses readily available information to identify opportunities for prevention and to indicate further work that may be helpful.

Dogs are valued companions for many families. Early socialisation with children and others is important for family dogs. Although a rare cause of death, dog bites or strikes are an important, potentially preventable, cause of death and injury to children. Young children are particularly vulnerable.

A key conclusion is that the most important advice for members of the public is *never leave a baby or young child unsupervised with a dog, even for a moment, no matter how well you know that dog.*

Opportunities for prevention and potential further work are identified.

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1 Background

Dogs are an important part of family life and valued companions for many families throughout Wales. Deaths from dog bites or strikes are rare, however, their nature and the circumstances within which they happen leads to wide spread media attention. The harm from dog bites or strikes on children who survive may attract less media attention but represents an important preventable cause of morbidity.

The Child Death Review Programme is established in Wales with an aim to identify and describe patterns and causes of child death, including any trends, and to recommend actions to reduce the risk of avoidable factors contributing to child deaths in Wales. The programme was sponsored by Welsh Government and has now undertaken reviews on deaths of teenagers in motor vehicles (Jones, Heatman, & Humphreys, 2013) and deaths through probable suicide (John et al, 2014).

Child deaths are relatively rare. For some causes of child death there will not be sufficient numbers of death to undertake a full review process. Nonetheless, there may be important opportunities for prevention.

This work is a pilot of a rapid review process. The process is intended to provide a mechanism for understanding opportunities to prevent deaths where a full thematic review is not appropriate. This involves a rapid assessment of available information to draw conclusions or identify areas for further work. The approach is being considered for (a) responding to specific concerns raised which require a more timely response than a full review and (b) where the level of information available may be less, with few or no reported deaths in Wales.

2 Purpose of review

This review sought to consider readily available information on deaths of children due to dog bites or strikes that could inform activity to prevent future deaths or identify further work that would be of benefit.

This review is the first rapid review the programme has undertaken. The learning from this review is also being captured to inform future reviews.

3 Method and information considered

A small panel met to discuss relevant information that was obtained including:

- Information on seven deaths in the England and Wales as described in media reports of events, including those collated by the Royal Society for the Protection of Animals (2011).

- Coroners responses on any recommendations made in relation to cases in Wales
- An analysis of hospital admissions from dog bites or strikes among children (see Appendix 1)
- Evidence identified through a brief review of published literature, both peer reviewed and grey literature (see Appendix 2)
- Recommendations and advice from various expert bodies
- Legislative context, including the *Anti-social Behaviour Crime and Policing Act 2014*, Chapter 12, part 7 Dangerous Dogs.

These findings were discussed separately with an expert in canine behaviour. The policy context was discussed with the Welsh Government policy lead responsible for dog welfare.

4 Conclusions

From the information available, the panel came to the following conclusions:

General conclusions:

- Dogs have an important place in society and are valued companions for many families throughout Wales. For most such families, dogs play an important, healthy part of family life.
- Deaths due to dog bites or strikes although rare, are of such a tragic nature that they receive widespread media attention and touch people across the nation.

Serious dog bites or strikes:

- Children are at particular risk of serious dog bites or strikes; in Wales, the peak age for admission among children in Wales is 2-4 years. Injuries among hospitalised children are usually to the face and head and require care of specialists in plastic surgery or oral and maxillofacial surgeons. Research suggests that these injuries often happen with a familiar dog in a familiar setting. Non-fatal injuries in these children can be harrowing for all concerned.
- Older children are more likely to be bitten on the hand or arm, and are more likely to be out in the open than younger children. Often the dog is not a familiar dog.
- Serious dog bites or strikes, requiring hospitalisation, are more frequent among children from more deprived areas than children from less deprived areas.

Deaths due to dog bites or strikes:

- Deaths of young children tend to occur with familiar dogs, although the dog may not be owned by the parents.
- The following were noted among the small number of deaths examined:
 - The child was most commonly an infant; some were older children.
 - The child may be in the care of a relative (e.g. grandparent).
 - The dog is a familiar dog, though often not the dog of the immediate family.
 - The owner of the dog is often not present.
 - Dog has unsupervised access to child (some).

Preventing bites and strikes

- Many agencies have developed advice about dog safety with families and children; however, currently there is no routine provision of information either to parents or dog owners in Wales about how to avoid risk to children (Appendix 3).
- Breed is not a good predictor of risk; other factors including the history of the dog, socialisation and context of the event are important.
- Given the nature of the relationship of families with dogs, and that the animals involved in these cases were all familiar animals, the options for interventions to prevent dog bites or strikes are limited. Evidence that provision of information had a lasting impact on knowledge or any impact on behaviour in relation to child-dog interaction was lacking.
- The panel could not form any judgement about regulatory or other changes that might have impacted on these deaths; we did not have access to reliable information relating to the history of the animals or other factors that might suggest intervention relating to those dogs would have had any impact on these cases. We did not examine issues of responsible ownership or the relationship between dog welfare and child welfare.
- Almost all leaflets identified emphasised the importance of ensuring babies and young children are not left alone with a dog.
- Dog owners should be aware of the risk to children, including when they (the dog owner) are not present.
- Dog owners should also be aware of the importance of socialisation, particularly with children, for the dog. Each dog will also have particular exercise or training needs.

5 Opportunities for prevention

- We conclude the single most important advice for members of the public is:

never leave a baby or young child unsupervised with a dog, even for a moment, no matter how well you know that dog.

- This, and other messages, could be highlighted to all new parents in a balanced way, emphasising that it is relevant to any contact with dogs, including when the child is in the care of others. Opportunities to highlight these messages include midwife contact antenatally, through health visitors in their capacity as advocates for child safety within communities and working with individual families, inclusion in updates of *Bump, baby and beyond*, the parent held personal child health record and other routes relating to public information on home and family safety such as Families First.
- There are opportunities to ensure that dog owners are aware of the risks to children, and aware of the need to share that advice with others who may be caring for the dog when the owner is not present. Such messages could be reinforced through breeders, veterinarians and others.

Other work that could be considered

- Further epidemiological examination of available data relating to dog bite admission and deaths may be valuable. Consideration of the reasons for higher rates in particular geographical areas would be beneficial.
- Any interventions put in place following this review could incorporate planned evaluation, for example in relation to parental understanding of risk or admissions of children to hospital.
- Further research into the effectiveness of interventions to reduce the risk of serious injury to infants, toddlers and older children, from dog bites/strikes would be beneficial.

References

Anti-social Behaviour Crime and Policing Act 2014. Chapter 12. [Online]. Available at: <http://www.legislation.gov.uk/ukpga/2014/12/enacted> [Accessed: 18 Aug 2014]

Jones SJ, Heatman B, Humphreys C. (2013). *Thematic Review of Deaths of Teenagers aged 13-17 years in motor vehicles between 2006-2010*. Swansea: Public Health Wales NHS Trust.

John A et al. (2014). *Thematic Review of Deaths of Children and Young People Through Probable Suicide, 2006-2012*. Swansea: Public Health Wales NHS Trust.

Royal Society for the Prevention of Cruelty to Animals. (2011). *Fatal dog attacks to children*. [Online]. RSPCA. Available at: <http://content.www.rspca.org.uk/cmsprd/Satellite?blobcol=urldata&blobheader=application%2Fpdf&blobkey=id&blobnocache=false&blobtable=MungoBlobs&blobwhere=1233002968994&ssbinary=true> [Accessed: 18 Aug 2014]

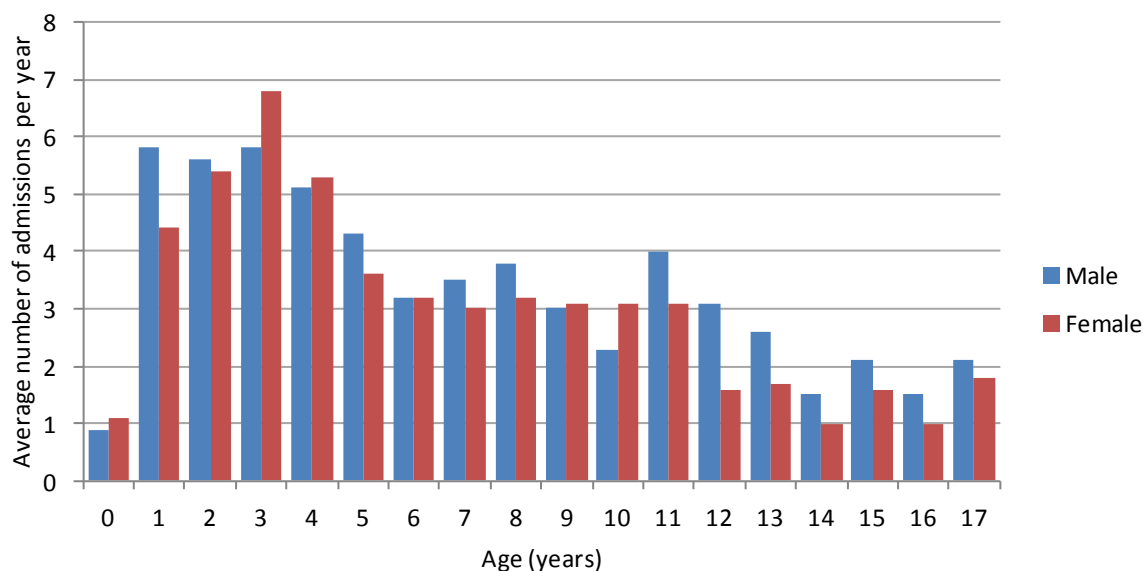
Appendix 1 Admissions for dog bites or strikes in Wales

This analysis describes numbers of admissions to hospital due to a dog bite or strike (hospital spell with any mention of ICD 10 W54), where either the child was admitted within Wales or is normally resident in Wales.

There were an average of 114 admissions of children (<18 years) with dog bites or strikes per year in Wales between 2003/4 and 2012/13. Just over half of these (52%) were among boys and the peak age for an admission with a dog bites strikes was between one and four years of age.

There is a suggestion of a difference in gender pattern across the age groups, including that boys appear more likely to be admitted with a dog bite or strike than girls in early teenage years (Figure 1). This pattern is different to that seen for the relatively small number of deaths due to dog bites or strikes which were predominantly in infancy.

Figure 1. Average number of admissions among children due to dog bites or strikes, Wales, 2003/4-2012/13

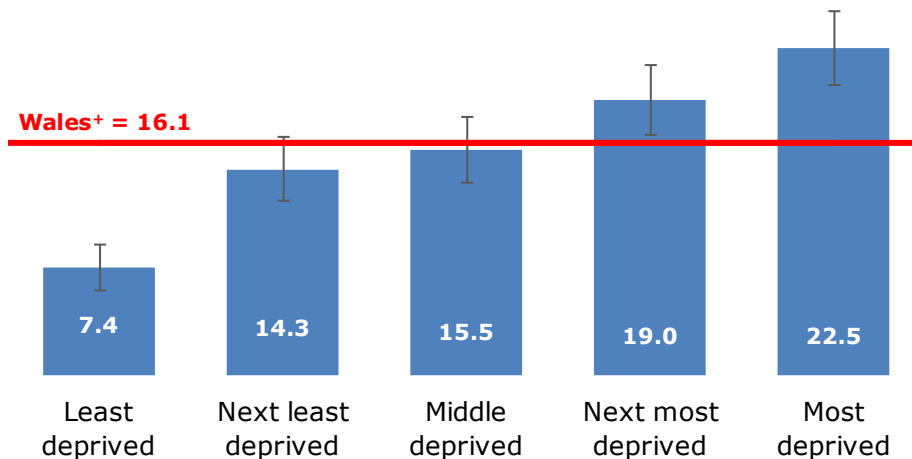


Data from Public Health Wales Observatory, using PEDW (NWIS)

There is a steep gradient in the rate of admission of children according to deprivation, based on area of residence. Rates of admission for dog bites/strikes are over three times higher among children from the most deprived areas as from the least deprived areas (Figure 2).

Figure 2 Rate of hospital admission for dog bite/strike per 100,000 children aged <18 by deprivation fifth, Wales, 2003/4-2012/13*

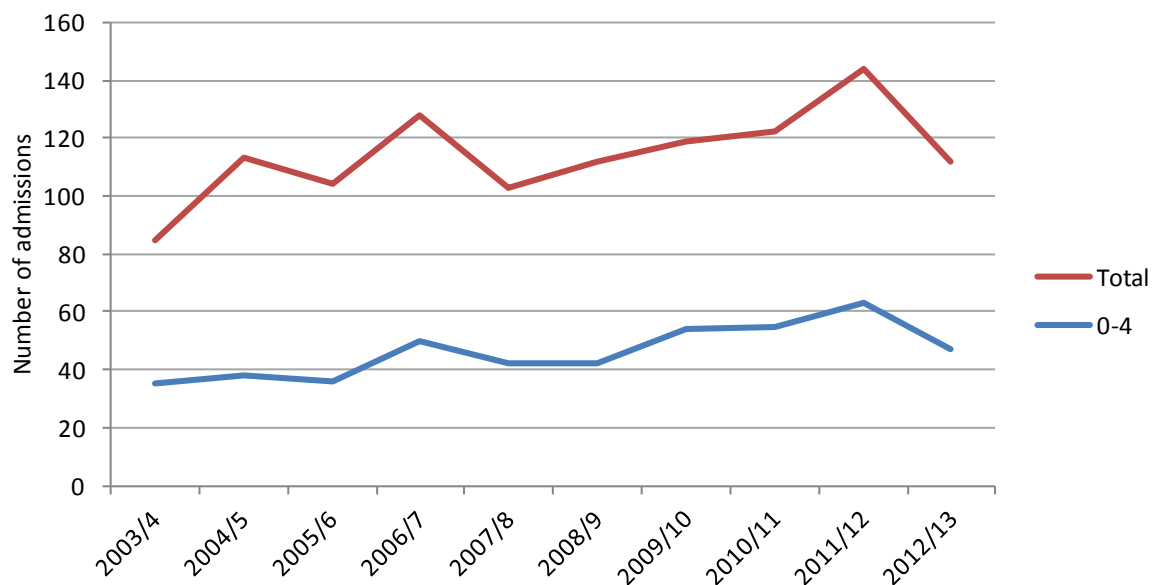
Produced by Public Health Wales Observatory using PEDW (NWIS) and MYE (ONS)



* Financial year of admission; + where LSOA of residence is known

There has been a suggestion of an upward trend in the numbers of children admitted for dog bites or strikes over the last decade, with a peak in 2012/13 (Figure 3). There have been some changes in the underlying sizes of these populations. Population based rates and a statistical test for trend would be helpful to further understand these rates.

Figure 3 Numbers of admissions for dog bites or strikes, children aged <18, Wales, 2003/4-2012/13

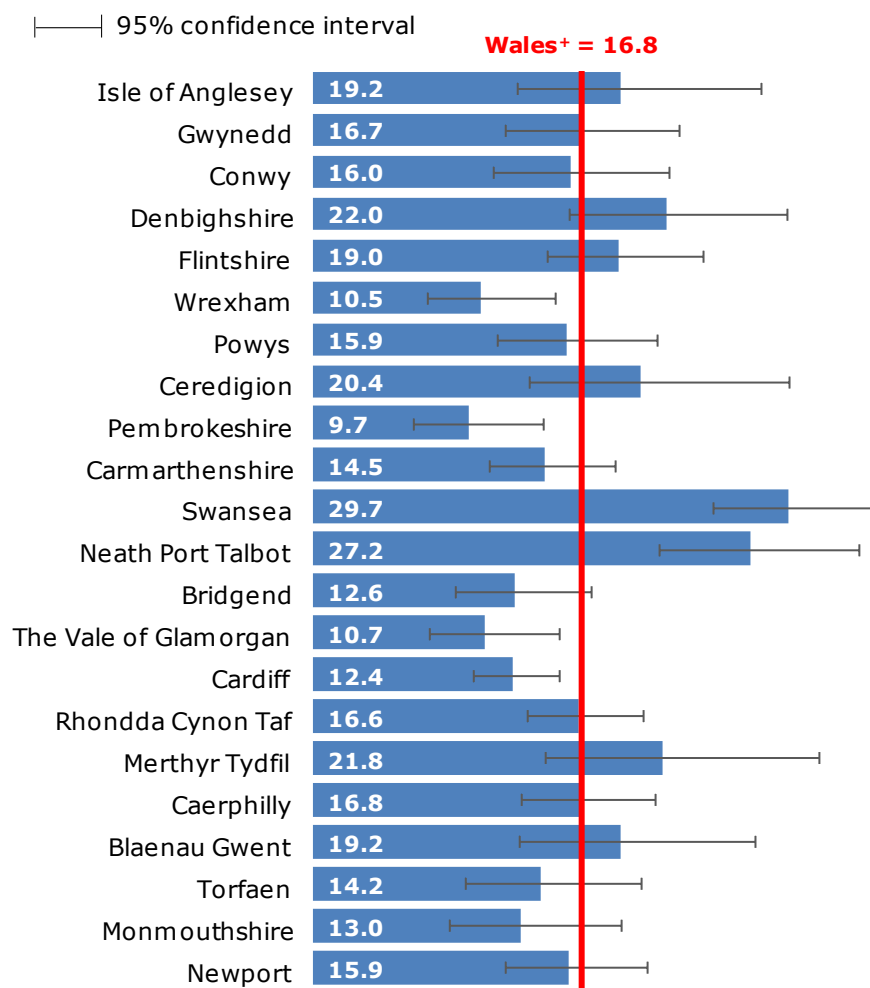


Data from Public Health Wales Observatory, using PEDW (NWIS)

There is substantial geographical variation in the rate of admission of children for dog bites/strikes across local authorities in Wales (Figure 4). Both Swansea and Neath Port Talbot areas having statistically significantly higher rates of admission than the Welsh average.

Figure 4 Rate of hospital admission for dog bite/strike per 100,000 children aged <18 by local authority of residence, Wales, 2003/4-2012/13*

Produced by Public Health Wales Observatory using PEDW (NWIS) and MYE (ONS)



* Financial year of admission; + where local authority of residence is known

Material published in England (HSCIC, 2014) has also described higher admission rates in the younger age group, substantial regional variation and association with deprivation, with injuries to the age patterns for admissions with dog bites or strikes. In addition this highlighted that most admissions among the youngest group analysed (0-9) were for open wound of head; with the next age group (10-29) being more likely to be wounds to an extremity. Plastic surgery and oral or maxillofacial surgery were the most common specialities for these episodes.

Reference

Health and Social Care Information Centre. (2014). *Provisional monthly HES for admitted patient care, outpatient and accident and emergency*

data - April 2013-January 2014: Topic of interest animal bites. [Online]. HSCIC. Available at: <http://www.hscic.gov.uk/catalogue/PUB11550/prov-mont-hes-admi-outp-ae-apr-may-13-14-toi-rep.pdf> [Accessed: 19 Aug 2014]

Appendix 2. Evidence from published literature

Literature search

A literature search was undertaken by the Public Health Wales Evidence Service on the question: What measures or advice have been recommended for the prevention of injury or death from dog bites or strikes in children, especially in a household setting, using the following framework:

	Population/ Problem/ Patient	Intervention or Exposure	Comparison/ Control	Outcomes/ Effects
From the research question	Dog bites Child 0-18	Educational interventions Dog breed control Government legislation		Reduction in number of dog bite related injuries & deaths
Synonyms	Dog bit* Dog attack\$			
MeSH/Thesaurus terms	Dogs Child Adolescent	Bites and stings/pc Wounds & injuries/pc		

Literature from 2008 to May 2014 was included where it was English language and related to developed countries.

The following sources were searched:

- Databases: CINAHL, Cochrane Library, EMBASE, HMIC, Library catalogue & knowledge base, Medline, NHS Evidence, NICE, PsycINFO, Public Health Wales Document database, PubMed (recently published articles), Bibliomap (Database of Health Promotion Research), DoPHER (Database of Promoting Health Effectiveness Reviews), Health Evidence Canada.
- Websites: Campbell, CAPIC, CDC, EPPI, NICE pathways, NICE public health topics, SafetyLit.
- Topic specific websites: American Veterinary Medical Association, British Veterinary Association, Blue Dog, Doggoneseafe, National Canine Research Council.

This was supported by Google searching and following up specific references of articles.

Literature identified fell into three broad categories: risk factors for serious dog bites; effectiveness of interventions; advice and statements from specific agencies.

Risk factors for serious dog bites

The following have been described as risk factors associated with dog bites, particularly those requiring emergency department attendance or hospital admission (Matthias et al, 2014; Reisner et al, 2011; Shuler et al, 2008) much of this information comes from America (but see information from England in Appendix 2):

Child factors:

- Age 5-9
- Younger children more likely to be injured in the face or head, more likely to be a familiar dog
- Older children more likely to be injured in an extremity, often not a familiar dog
- No adult who would be capable of intervening present during the event
- Association with income lower than mean reported

Dog factors:

- Male, sex intact (not consistent)
- Pure bred & specific breeds highlighted

An interview based case series of 203 children attending an emergency department in America distinguished features among younger children (<7) from older children (Reisner et al 2011), Table 1.

Table 1 Features associated with dog bite in a child presenting to an emergency department in America, as described by Reisner et al, 2011.

	Age <7	Age 7-17
Familiar dog	81%	63%
Face/head wound	70%	33%
Parent present	84%	29%
Benign interaction (e.g. hugging)	45%	24%
Dog in motion	31%	50%

A review of all child deaths across America (Patronek, 2014) over a ten year period (2000-2009) found multiple factors coming together associated with deaths. Although 62% of the 256 deaths were among

children (<15 years), there was no specific analysis of these factors for children. These factors included:

- Victim has no familiar relationship with the dog.
- No able bodied person present.
- Victim compromised in ability (e.g. due to age).
- Resident (isolated) dog.
- Dog not spayed/castrated.
- Evidence of mismanagement of dog.
- Evidence of abuse/neglect by owner.

Effectiveness of interventions to reduce dog bites

A number of studies were identified that examined attempts to improve knowledge of school age children for the prevention of dog bite injuries. This includes a Cochrane review (Duperrex et al, 2009) of two studies, one among children age 4-6 and one among children age 7-8. Both demonstrated a short term (7 days/2 weeks) improvement in knowledge and/or behaviour. The review concluded:

“Short educational programmes to prevent dog bites can be provided in school settings with a probable positive effect in the short term on knowledge, attitude and behaviour of children. The duration of this effect is unknown. No conclusion can be drawn on how best to conduct such programmes. The effectiveness of educating adolescents to prevent dog bites is not known. Public health policies should not rely only on educating children and adolescents as a primary measure to reduce the burden of dog bites in this population.”

Other studies have similarly demonstrated a short term improvement in knowledge (Dixon, 2013; Shields, 2012; Coleman, 2008). One of these (Coleman, 2008) assessed knowledge beyond 2 weeks, in this study ‘there was little evidence of retention of this information 2 and 4 months after instruction’.

The Blue dog programme has been assessed in a UK population (Meints and Keuster, 2009) and then through a randomised design (Schwebel et al, 2012), including assessing affects on parental behaviour (Morrongiello et al, 2013). Although initial change in knowledge was promising (Meints and Keuster, 2009), this did not translate into altered behaviour in a simulated or real setting (Schwebel et al, 2012), or to altered parental behaviour (Morrongiello et al, 2013).

Two studies were identified which sought to examine the effect of regulatory changes on dog bites (Raghavan et al, 2013; Vilalbi et al, 2010). Although both reported some positive findings; they were not considered to be strong or consistent.

Statements from specific agencies

The following statements from specific agencies were identified and considered:

American Veterinary Medical Association Task Force on Canine Aggression and Human-Canine Interactions. (2001). A community approach to dog bite prevention. *J Am Vet Med Assoc* 218(1): 1732-1749. Available at: <https://www.avma.org/public/health/documents/dogbite.pdf> [Accessed: 19 Aug 2014]

Australian Veterinary Association Ltd. (2012). *Dangerous dogs – a sensible solution. Policy and model legislative framework*. St Leonard's: The Australian Veterinary Association Ltd. Available at: http://www.ava.com.au/sites/default/files/AVA_website/pdfs/Dangerous%20dogs%20-%20a%20sensible%20solution%20FINAL.pdf [Accessed: 19 Aug 2014]

British Veterinary Association. (2014). *Policy statement on dangerous dogs*. British Veterinary Association. Available at: http://www.bva.co.uk/uploadedFiles/Content/News_campaigns_and_policies/Polices/Companion animals/ps dangerous dogs.pdf [Accessed: 19 Aug 2014]

References

Coleman GJ et al. (2008). An evaluation of a pet ownership education program for school children. *Anthrozoos* 21 (3): 271-84

Dixon CA et al. (2013). An evaluation of a dog bite prevention intervention in the pediatric emergency department. *J Trauma and Acute Care Surg* 75 (4:Suppl 3): 308-12

Duperrex O et al. (2009). Education of children and adolescents for the prevention of dog bite injuries. *Cochrane Database Syst Rev* (2): CD004726. Available at: <http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD004726.pub2/abstract;jsessionid=BD1DC5C2CB592E39A7DE0D278DA09466.f02t02> [Accessed: 19 Aug 2014]

Matthias J et al. (2014). Cause, setting and ownership analysis of dog bites in Bay County, Florida from 2009 to 2010. *Zoonoses Public Health*; Apr 9. doi: 10.1111/zph.12115.

Meints K and Keuster T. (2009). Brief report: Don't kiss a sleeping dog: the first assessment of "the blue dog" bite prevention program. *J Pediatr Psychol* 34 1084-90

Morrongiello BA et al. (2013). Examining parents' behaviors and supervision of their children in the presence of an unfamiliar dog: does The Blue Dog intervention improve parent practices? *Accid Anal Prev* 54: 108-13

Patronek GJ et al. (2013) Co-occurrence of potentially preventable factors in 256 dog bite-related fatalities in the United States (2000-2009). *Am Vet Med Assoc* 243(12): 1726-36.

Raghavan M et al. (2013). Effectiveness of breed-specific legislation in decreasing the incidence of dog-bite injury hospitalisations in people in the Canadian province of Manitoba. *Inj Prev* 19(3): 177-83.

Reisner IR et al. (2011). Behavioural characteristics associated with dog bites to children presenting to an urban trauma centre. *Inj Prev* 17 (5): 348-53

Schwebel DC et al. (2012). The Blue Dog: evaluation of an interactive software program to teach young children how to interact safely with dogs. *J Pediatr Psychol* 37(3): 272-81

Shields WC et al. (2012). Dog bites: an opportunity for parent education in the pediatric emergency department. *Pediatr Emerg Care* 28(10): 966-70

Shuler CM et al. (2008). Canine and human factors related to dog bite injuries. *J Am Vet Med Assoc* 232(4): 542-6

Villalbi JR et al. (2010). Decline in hospitalisations due to dog bite injuries in Catalonia, 1997-2008. An effect of government regulation? *Inj Prev* 16 (6): 408-10

Appendix 3 Examples of information for the public in relation to safety of dogs and children

The Association of Pet Behaviour Counsellors, UK, have an extensive list of approved links to dog safety Resources for Children at different ages, parents teachers and veterinary nurses. It includes resources from the Dog Trust, the Kennel Club, Blue Dog and others and is available at: http://www.apbc.org.uk/info/dog_safety_information

Blue Cross has specific leaflets relating to dog safety and babies, toddlers and families available at: <http://www.bluecross.org.uk/1958/looking-after-your-dog.html>

Caerphilly Safeguarding Children Board has produced a leaflet Children and Dogs – Safety Advice for Parents Carers and Babysitters available at: <http://www.caerphilly.gov.uk/cscb/pdfs/Safety%20With%20Dogs%20Leaflet.pdf>

All accessed 18 June 2014