Dog Behavior, 2-2022, pp. 45-56 • DOI 10.4454/db.v8i2.157

Bite monitoring in Aosta Valley from 2014 to 2020

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Abstract: the aim of this survey was to analyze the bites recorded by the Simple Structure of veterinary epidemiology of the Aosta Valley Local Health Unit, from 2014 to 2020, to identify and outline the average biting dog's features, those of the assaulted subject and those of the context in which attacks happen. Most of the reports that have been taken into consideration referred to events linked to domestic dog bites, in a region which is good for zootechnics and tourism, and for a period considered statistically significant. In particular, the study focuses on aggressive episodes, and correlates them to relevant activities carried out at the Simple Structure of veterinary epidemiology.

In order to standardize the evaluation of biting dogs and efficiently prevent biting dog attacks, a procedure with numerical data has been adopted using an assessment grid that characterizes prevention measures to be applied to biting dogs and their owners' behavior.

In order to evaluate owners' understanding (both as a citizen and animal owner) and to propose an operating protocol for aggressiveness risk assessment, situations have been examined, allowing the in-depth study of the context of accidents and the dynamics which have caused them. As far as these situations are concerned, it is important to remember that public opinion can be easily influenced by press campaigns which are sometimes considered unjustified.

In the end data collection can be useful for a better prevention of most frequent forms of aggressiveness recorded by the Veterinary Service.

Key Words: aggressiveness, bite, assessment grid, risk assessment.

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Introduction

For a long time, dog bites have been a particularly delicate problem in society and bite events have often been used by the media which have helped to create public reaction and sometimes even an excessive alarm among people. The probability that a dog might bite is not often accepted as a risk and, because of the considerable social and emotional cost of bites, the common feeling, often broadcast by the media, is the intention to remove the problem as soon and as radically as possible. However, the prevention of these events is a target that demands appropriate effort, commitment and information from people who adopt a dog, breed it and look after its health and wellbeing (Dehasse, 2006; Levi et al., 2009).

With the aim of a better and complete understanding of the situation, much research has been carried out with the purpose of analysing risk incidence, causes, contexts and factors related to attacks and then to their epidemiology (Beaver, 1983; Wright, 1985; Wright, 1990; Gershman et al., 1994; Sacks et al., 1996; Overall & Love, 2001; Penny & Reid, 2001; Guy et al., 2001; Cohen & Richardson, 2002; Reisner, 2003; Mills & Levin, 2006; De Keuster, 2008; O'Sullivan et al., 2008; Messam et al., 2008; Rosado et al., 2009; Overall, 2010; Farnworth et al., 2012; Vargo et al., 2012; Horisberger et al., 2004; Keuster et al., 2006; Cornelissen & Hopster, 2010; Messam et al., 2013).

In these terms the Simple Structure of veterinary epidemiology belonging to the Animal Health Complex facility, within the Prevention Department of Aosta Valley local health unit, has collected and worked out all bite warnings received from 2014 to 2020 and summed them up in this report.

Submitted, 10/17/2022
Accepted, 12/17/2022

Material and methods

In this study bites reported between 2014 and 2020 in Aosta Valley and recorded by the Simple Structure of veterinary epidemiology, Prevention Department of Aosta Valley local health unit, have been analysed.

In order to standardize a biting dog's evaluation as provided by law and to efficiently prevent biting dog attacks (schedule 2), since 2017 a procedure with numerical data has been adopted using an assessment grid (schedule 1) which characterizes prevention measures to be applied to the behaviors of biting dogs and their owners.

The choice of a numerical grid originates from the need to standardize the evaluation of biting dogs' behavior as much as possible, giving a practical, rapid and cheap tool to the vet of veterinary epidemiology facility, and avoiding behavioral expert's therapeutic intervention, at least in the first phase of the assessment.

The grid (Carlevaro et al., 2009) has been arranged considering different models which already exist in medical literature; in particular the schedule proposed by Professor Angelo Gazzano from Pisa University, Department of Veterinary Science, making use of advice from professional veterinarian Doctor Raimondo Colangeli.

Schedule 1. Biting dog's numerical assessment form.

CODE	RACE/BREED	
COAT SEX	AGE	SIZE
	Score to be assigned	Assigned score
Dog's weight		
Under 5 kilos	1	
Between 6 and 20 kilos	3	
Between 21 and 36 kilos	5	
Over 36 kilos	7	
Bites number		
First bite or bite attempt	1	
Second bite or bite attempt	5	
Third bite or more bites or bite attempts	7	
Place in which the attack has occurred and person who has been attacked		
Within the usual residence, person unknown	1	
Outside the usual residence	2	
Within the usual residence, person known	3	
Type of assault		
Due to pain	1	
Other cause	3	
Dog's condition during the attack		
Tethered dog unable to avoid contact	1	
Free dog	3	
Predictability of attack		
Presence of evident menacing attitude (growl, bark)	1	
Attack's circumstances unknown	3	
Direct attack	5	

Wound location	
Arms, hands, legs, feet	1
Thorax, abdomen	3
Head, neck	5
	Total score

Comments
The above-mentioned dog is included in the profile BITER N°

_____
Local Health Unit Veterinarian

Schedule 2. Legend to state the biter profile.

SCORE	PROFILE	PRESCRIPTIONS
Total score up to 19	BITER 1	The owner will have to adopt suitable and necessary precautions in order to guarantee third party protection from attacks and damages.
Total score between 20 and 24	BITER 2	The owner will have to adopt suitable and necessary precautions in order to guarantee third party protection from attacks and damages. It is obligatory: 1) for the owner to attend the training course in order to obtain the licence; 2) to take out a civil liability insurance policy for third party damages caused by the dog. 3) to restrain the dog with leash and muzzle in urban areas and public places. A behavioral assessment is recommended.
Total score 25 or over	BITER 3	The owner will have to adopt suitable and necessary precautions in order to guarantee third party protection from attacks and damages. It is obligatory: 1) for the owner to attend the training course in order to obtain the licence. 2) to take out a civil liability insurance policy for third party damages caused by the dog. 3) to restrain the dog with leash and muzzle in urban areas and public places; 4) to check dog's behavior.

Information on both the victim and aggressor has been collected and bites have been subdivided according to risk level, period of the year and town in which the event happened.

Results

In the period 2014-2020, 1017 attacks have been analysed, with an average of 114 per year, 93% inflicted by a dog (Figure 1).

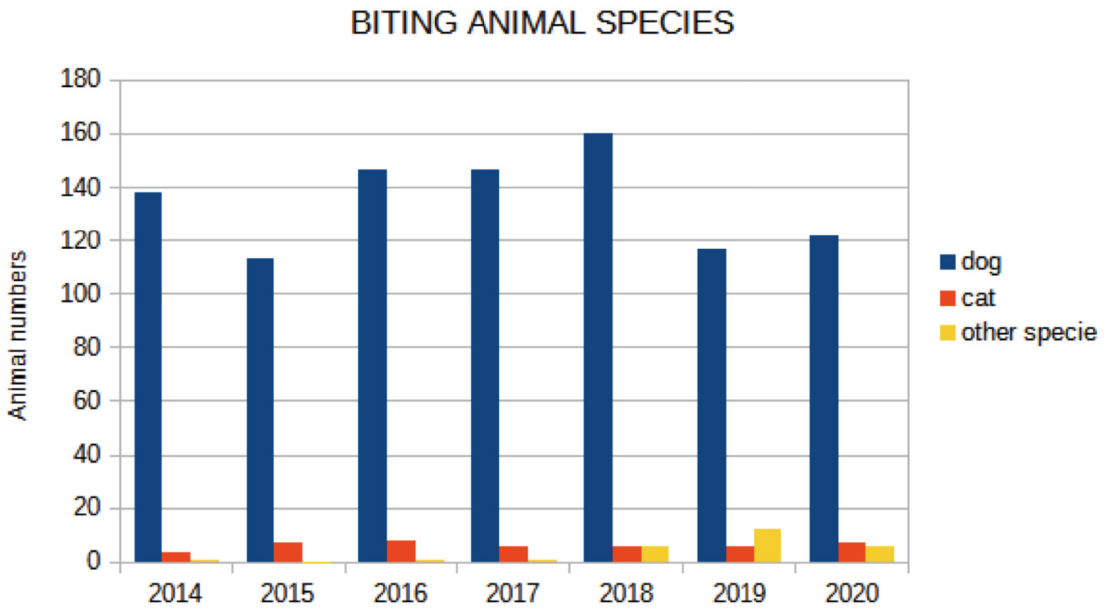

Fig. 1. Number of biting animals during the observed period.

Most of the victims (83%) of dog attacks are people usually not belonging to the dog's family (64%); 72% are young-adult people between 10 and 65 while 8% are children under 10. (Figure 2)

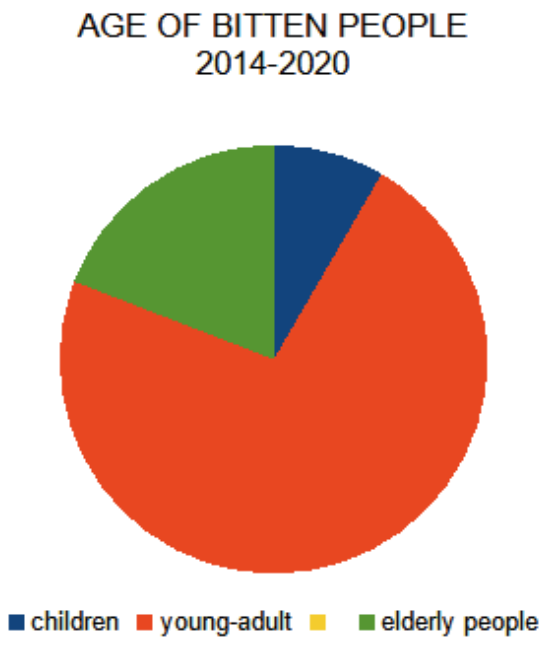

Fig. 2. Age of bitten people

There is no significant difference between assaulted males and females (49% vs 51%) and between superficial bites and deep bites (48% vs 52%). Most body parts affected by dog aggressions are limbs (76%), followed by head/neck (10%), other parts of the body (9%) and thorax/abdomen (5%). (Figure 3)

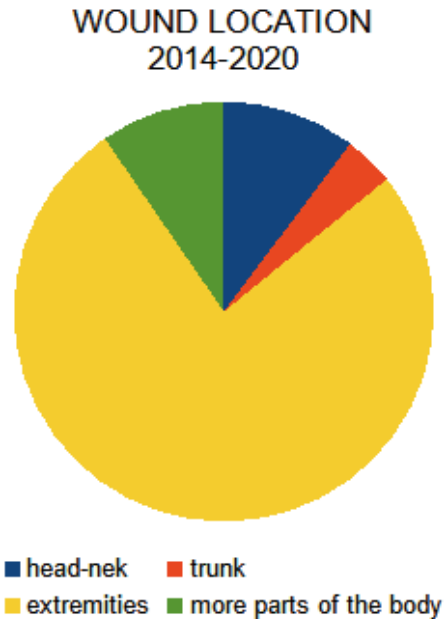

Fig. 3. Location of wounds

The analysis of single bites has enabled the profiling of a biting dog which, in 70% of the cases, is a male, adult (74%), big size (50%), free (81%). Dog attacks may be caused by fighting dogs (23%), dog's pain (10%) or other reasons (55%) because of lack of information. (Figure 4)

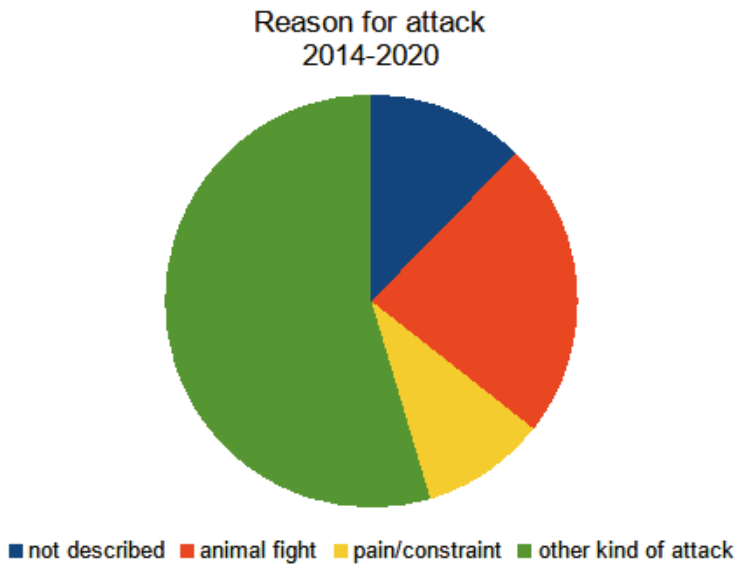

Fig. 4. Reason for attack

In 62% of the cases the predictability was unknown, 20% of the dogs showed signs of threat such as a growl or bark while in 18% of the cases it was a direct attack. (Figure 5)

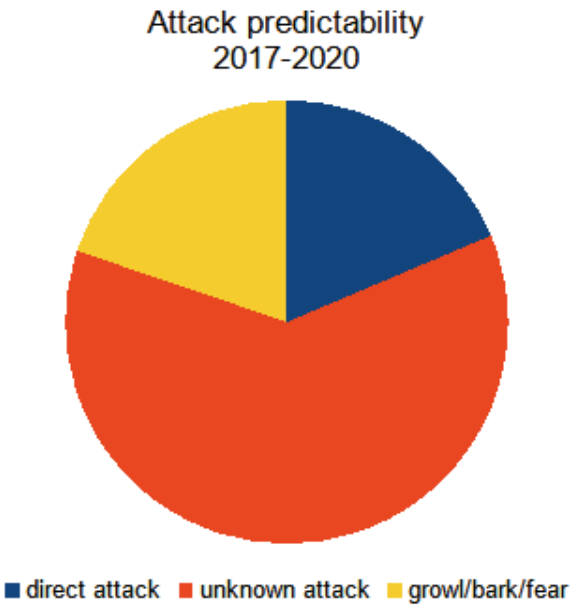

Fig. 5. Attack predictability.

In 52% of the cases biting dog phenotype is represented by cross-breed dogs, followed by Pit Bulls (5%), German Shepherds (4%) and Border Collies (3.6%). (Figure 6)

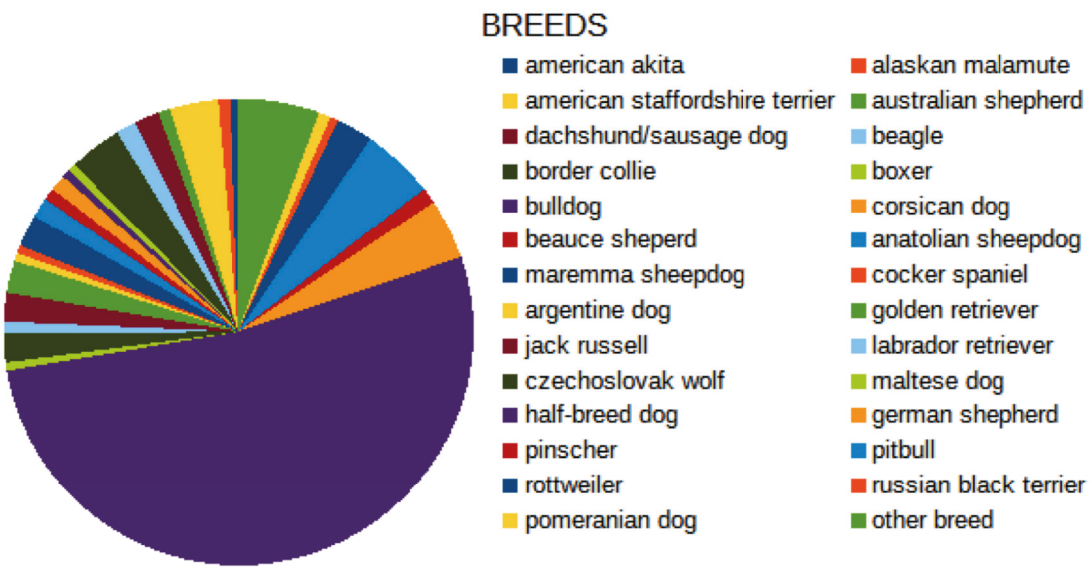

Fig. 6. Biting dogs breeds.

Among 472 dogs assessed using the grid, 72% was at low level of potential biting risk, 22% at medium level while 6% at high level. (Figure 7)

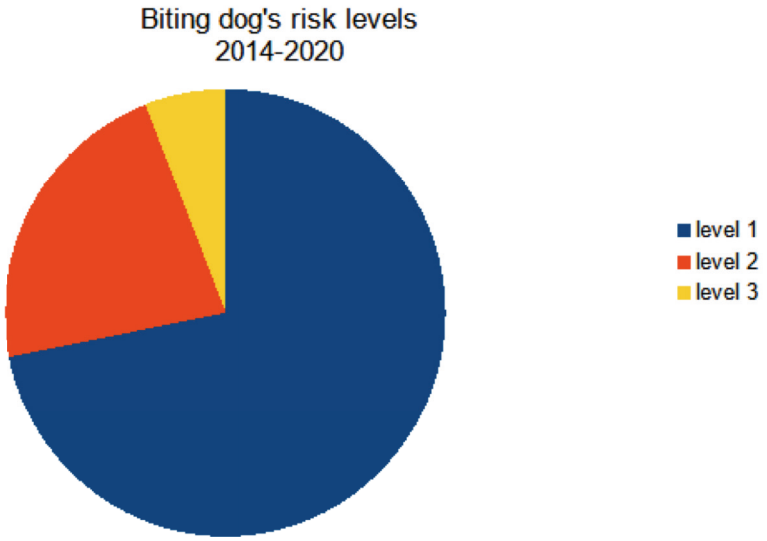

Fig. 7. Biting dog's risk levels.

Bites have been divided according to the months of the year in which they have occurred (Figure 8). Their increase happens especially in the summer, probably because of people's outdoor activities and tourists who cross mountain pastures where sheepdogs are herding flocks.

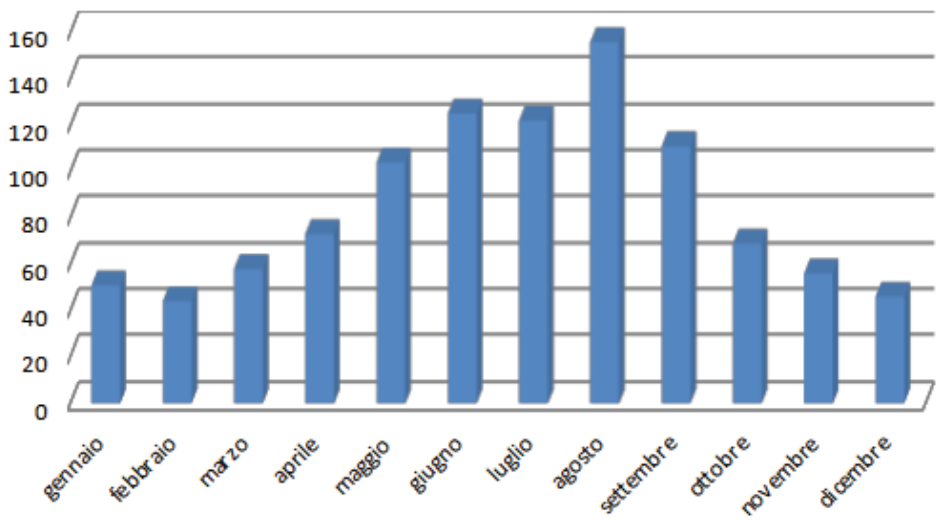

Fig. 8. bites/month of the year.

Bites have been subdivided depending on the municipality in which they have occurred. Aosta Valley Region has got 74 municipalities and in 2020 had 125 thousand inhabitants and nearly 25 thousand dogs recorded in the pets' data bank, with the ratio of 1 dog to 5 inhabitants. Obviously Aosta municipality, which is densely populated, has seen the highest number of bites.

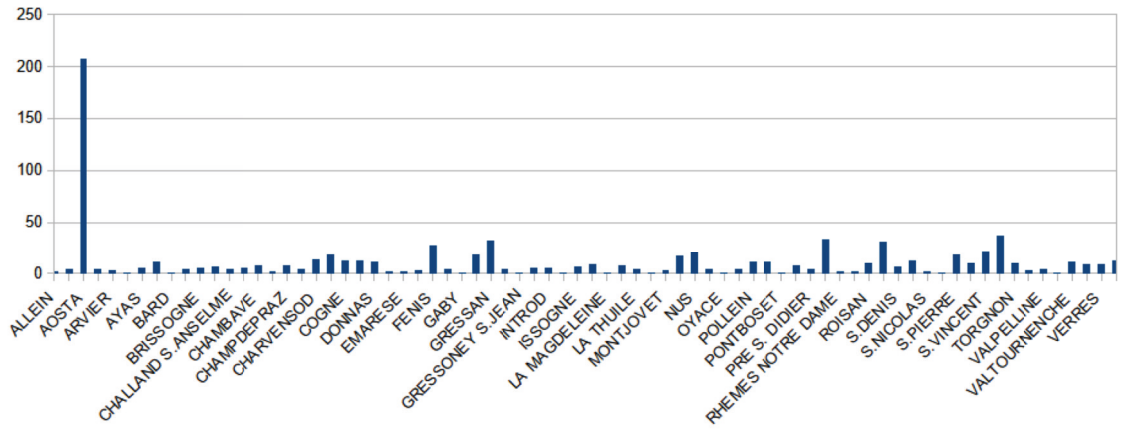

Fig. 9. attacks/municipalities of Aosta Valley.

Discussion

The analysis of the results collected at regional level between 2014 and 2020 reflects the data of the bibliography, both at national and international level, with regard to the epidemiology of bites.

During the 7 years considered there was a total of 1017 animal attacks, 93% of which had been caused by a dog. Fortunately, of the 472 dogs assessed, 72% were included in a low bite potential risk as it concerns accidental bites which are predictable and not particularly worrying.

As far as the predictability of the attack is concerned, many authors affirm that most of the bites would have been predictable as they were preceded by clear threat signs (Mathews & Lattal, 1994) and quite often the dog had been provoked and reacted accordingly (Borchelt, 1986; Chomel & Trotignon, 1992; Daniels 1986).

Unpredictable attacks, without warning signs, are most rare and in particular severe forms (Mathews & Lattal, 1994).

Many authors report that the most frequent victims of dog attacks are mainly children under 10 years old (Weiss et al., 1998). According to Dehasse (2011), 33% of the children are bitten by a dog between birth and 15 while from 15 to 80 about 40% of the adults are bitten. Luckily at regional level children under 10 years old are only 8% of victims.

Most of the times bites occur while the dog is doing some of its main daily activities such as eating and playing or when it is petted or brushed. According to Beaver (2009), 26% of the attacks directed to children are due to competition for resources such as food or toys. This confirms that domestic dogs usually bite family members.

For this reason, aggressiveness concerns the relationship between man and dog (Chomel & Trotignon, 1992; Horwitz et al., 2002; Reisner, 2003).

Fully-grown, big size male dogs (70% at regional level) known by the victim (often the family dog) are usually the most frequently reported for bites (Sacks et al., 1996; Gershman et al., 1994; Overall, 2001; Horwitz et al., 2002).

The incidence of different dog breeds in the statistics of bites has always been the subject of many studies (Serpell & Podberscek, 1997; Perez-Guisado et al., 2006; Böttjer, 2003; Dowd, 2006; Shalke et al., 2008, 2010; Dowd, 2006; Ott et al., 2009). Some dog breeds (Pitt Bull, German Shepherd, Alaskan Malamute, Rottweiler, etc.) and relative cross-breeds are often associated with numerous aggressive episodes (Calkins et al., 2001; Sacks et al., 1996) and in particular to those which have tragic outcomes, because of their size, strength of jaw and weight (Palacio et al., 2005).

Other authors report that in the United States the breeds most frequently involved in such episodes are half-breeds, German shepherds and their cross-breeds or Pitt Bulls and similar dogs (Pinckney & Kennedy, 1982; Sacks et al., 1989; Wright, 1991).

According to the study carried out in 2009 by Ciceroni & Gostinicchi, the breed most responsible for biting people was the German shepherd, followed by male half-breeds of medium-large size. Despite various Ministerial ordinances concerning the so-called "dangerous" breeds, most bites at regional level have been inflicted by a half-breed dog (52%) in the period observed.

Conclusion

To transform the sanitary observation of biting dogs from an activity exclusively aimed at hydrophobia prevention (DPR 320/54, Veterinary Police Regulation) to bite prevention activities, it is necessary to apply a procedure that provides the following set of forms:

- surveys concerning even ethological-behavioral characteristics of every subject;
- detention management modalities;
- a specific bites data bank;
- a greater and more effective application of dog data;
- a greater health education action towards dogs' owners (pets' correct socialization, dog's ethogram knowledge, appropriate management);
- citizens' education and information;
- more specific training for public veterinarians;
- the possibility, if it is necessary, to prescribe ethological-behavioral consulting;
- the adoption, when it is necessary, of specific prescriptive ordinances (duty to subject the animal to observation – liability to custody with particular caution, etc.);
- breeders' responsibleness in subjects' selection;
- a greater supervision in dog-breedings (pets should never leave the breeding home before they are 2 months and before their registration and identification is done).

In the remarks expressed in this work, the activities and the job started by the Veterinary Epidemiology Structure, aimed at improving the comprehension and management of dog bite risk, have been highlighted. In order to realize the situation, it is necessary to understand the elements and the powers that determine it, identify the points on which it is possible to act in order to control it and obtain useful elements to reduce its negative impact.

Dog attacks aren't free of these common rules, so this work has concerned different aspects always keeping in mind the general principles and objectives that it wanted to achieve.

Knowing that it is impossible to avoid bite injuries, the challenge of the Veterinary Epidemiology Structure is to increase the knowledge of the dynamics and the techniques of dogs' risk assessment, with an integrated approach between medical and veterinary structures. This allows both analysis of events' dynamics and risk, to make the estimation criteria more objective and concrete, thus increasing people's awareness with particular attention to dogs' owners and risk categories.

Coherently with what is set out above, much is being invested particularly in training and updating public vet employees and animalist associations' volunteers, as well as in health education initiatives addressed to dogs' owners and citizenship (schools, dog's homes, pet shops, public meetings, etc.) with ad hoc courses and informative material.

Owner's identification of dog's threat behaviors is fundamental to:

- identify dog's emotional state;
- owner's modality and ability to face problematic situations;
- prevent and then avoid dog's excessively stressful conditions or operational problems.

Dog owners who underestimate many aggressive behaviors and provoke severe episodes aren't rare. For this reason it is essential to pay attention to dog's behavior and to be able to communicate with it early and effectively.

Warning signs, if identified early and correctly interpreted by the potential victim, should result in a reduction of the threat avoiding the following steps which generally lead to a real attack (Horwitz et al., 2002; Mege et al., 2006). Dogs often bite when people don't understand their needs (Capra & Robotti, 2008).

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Monitoraggio delle morsicature in Valle d'Aosta dal 2014 al 2020

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Sintesi

Lo scopo di questa indagine è stato quello di analizzare le morsicature registrate dalla Struttura Semplice di epidemiologia veterinaria dell'Azienda Sanitaria Locale Valle d'Aosta, dal 2014 al 2020, per identificare e delineare le caratteristiche del cane mordace medio, quelle del soggetto aggredito e quelle del contesto in cui avvengono gli attacchi. Sono state prese in considerazione, in una regione vocata alla zootecnia e al turismo, segnalazioni riferite ad eventi prevalentemente legati a morsi di cani domestici, per un periodo ritenuto statisticamente significativo, con particolare riferimento agli episodi aggressivi, correlandoli ad attività rilevanti svolte presso la Struttura Semplice di Epidemiologia Veterinaria. La maggior parte delle segnalazioni prese in considerazione si riferivano ad eventi legati a morsicature di cani domestici, in una regione vocata alla zootecnia e al turismo e per un periodo ritenuto statisticamente significativo. In particolare, lo studio si è concentrato sugli episodi aggressivi, e li ha correlati alle attività rilevanti svolte presso la struttura Semplice di epidemiologia veterinaria.

Al fine di uniformare la valutazione del cane che morde e renderla il più possibile omogenea oltre che per prevenire efficacemente gli attacchi del cane che morde, è stata adottata una procedura con dati numerici utilizzando una griglia di valutazione che consente di caratterizzare le misure di prevenzione da applicare ai cani che mordono e i comportamenti del loro proprietario.

Per valutare la sensibilità dell'uomo (in quanto cittadino e proprietario di animali) e proporre un protocollo operativo per la valutazione del rischio di aggressività, sono stati esaminati i fenomeni per approfondire il contesto degli incidenti e le dinamiche che li hanno provocati. Per quanto riguarda questo fenomeno, è importante ricordare che la sensibilità dell'opinione pubblica può essere facilmente influenzata da campagne di stampa a volte ritenute ingiustificate

Infine la raccolta dati può essere utile per una migliore prevenzione delle più frequenti forme di aggressività registrate dal Servizio Veterinario.