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The Opinions of Veterinary Health Professionals and the General Public on Breed-Specific Legislation Regarding Dogs

Az Állategészségügyi Szakemberek és a Nagyközönség Véleménye a Kutyákra Vonatkozó Fajtaspecifikus Jogszabályokról

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Abstract

Breed-specific legislation (BSL) refers to laws that restrict or ban ownership of certain dog breeds often considered dangerous. Although widely implemented, BSL remains controversial due to its concerns regarding effectiveness, scientific basis, and welfare implications. This study compares the opinions of veterinary health professionals (VHPs) to those of the general public regarding BSL and its influence on the welfare of affected dogs. An online questionnaire was distributed internationally, yielding 79 responses from 19 countries. Of these, 52 (65.8%) respondents were VHPs and 27 (34.1%) were members of the general public. Descriptive analysis and Fisher's exact tests were used to compare groups. Respondents significantly differed in their willingness to own a pit bull, with 50.0% of VHPs and 18.5% of the general public being willing to do so. Overall support for or opposition to BSL differed between groups but follow the same trend towards limited support for such measures. Opposition was the most common position among VHPs: 14/52 (26.9%) somewhat opposed BSL and 15/52 (28.8%) strongly opposed it. The general public showed similar distributions. These results suggest that professional experience is associated with lower support for BSL, with a stronger emphasis on alternatives such as owner responsibility, training, and management rather than breed.

Absztrakt

A fajtaspecifikus jogszabályok (breed specific legislation, BSL) olyan jogszabályokat jelentenek, amelyek korlátozzák vagy tiltják bizonyos veszélyesnek ítélt kutyafajták tartását. Bár széles körben alkalmazzák ezeket a jogszabályokat, a hatékonyságuk, tudományos megalapozottságuk és állatjólléti vonatkozásaik kapcsán számos aggály felmerül. Jelen tanulmány az állategészségügyben dolgozók és a nagyközönség véleményét hasonlítja össze a BSL-lel és az érintett kutyák jóllétére gyakorolt hatásával kapcsolatban. A szerző egy online kérdőívet terjesztett, amelyre 19 országból 79 válasz érkezett. Közülük 52 (65,8%) válaszadó állategészségügyi szakember vagy egyéb módon az állatokhoz kötődő munkát végez (VHP), 27 (34,1%) pedig a nagyközönség tagja volt. A csoportok összehasonlításához leíró elemzés és Fisher-féle egzakt tesztek készültek. A válaszadók szignifikánsan eltérő hajlandóságot mutattak a pitbullok tartására, míg a VHP-k 50,0%, a nagyközönségnek csupán 18,5%-a lenne hajlandó erre. A BSL általános támogatottsága vagy elutasítása a csoportok között eltérő volt, de ugyanazt a tendenciát követte, mint az egyes intézkedésekről alkotott vélemények. A VHP-k körében a leggyakoribb álláspont az ellenzés volt: 52-ből 14 (26,9%) ellenezte a BSL-t, míg 52-ből 15 (28,8%) határozottan ellenezte azt. A nagyközönség hasonló megoszlásokat mutatott. Ezek az eredmények arra utalnak, hogy a szakmai tapasztalat a BSL alacsonyabb támogatottságával jár, az egyes fajták hangsúlyozása helyett a tulajdonos felelősségét, a megfelelő tréninget és tartásmódot tartják fontosabbnak az emberek.

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1. Introduction

Breed specific legislation (BSL) refers to laws that prohibit or restrict ownership of certain dog breeds that are deemed dangerous and considered a threat to public safety [1]. Such laws may ban ownership completely, or they may impose certain restrictions or conditions of ownership like spay/neuter requirements, muzzling in public, liability insurance, etc. [2]. The most frequently banned breed worldwide is the pit bull [3]. However, it is important to note that the pit bull is not a breed in itself, but rather "pit bull" is a blanket term to describe different breeds with similar build. The three most common breeds under this term are the American Pit Bull Terrier (APBT), American Staffordshire Terrier (AmStaff), and the Staffordshire Bull Terrier [4]. Unless otherwise specified, all references in this paper to "pit bull" or "pit bull type dog" will refer to this blanket term. Other legislated breeds include (but are not limited to) Rottweilers, Doberman Pinchers, Mastiffs, Akitas, and German Shepherd Dogs [5].

The modern wave of breed bans originated in the 1980s following a number of high-profile attacks attributed to the pit bull. Media coverage of such attacks often used provocative headlines and fear-inducing imagery, resulting in a moral panic that led legislators to pass sweeping bans [6]. Legislators would justify such measures as needed to ensure public safety, sometimes citing data that suggested certain breeds were responsible for a disproportionate number of bite incidents [4]. In the UK, for example, the Dangerous Dogs Act of 1991 banned four breeds [7]. Similar laws have been passed throughout parts of the USA, Canada, and Australia, as well as several European countries [8]. Today, over 80 countries have enacted some form of breed specific legislation [3].

Proponents of BSL believe that certain dog breeds pose a threat to public safety, and that this threat can be mitigated or reduced by implementing breed specific legislation [6]. Opponents, however, question both the ethics and effectiveness of such laws [6] and believe that they only create the illusion of enhancing public safety. They claim that dog bite statistics are "plagued by methodological problems", and that "forensic case studies (…) focus on "bizarre" attacks" [8]. Veterinary and animal behavior experts stress that aggression is a multifactorial trait, influenced not just by breed but also by other factors such as genetics, socialization, environment, and owner behavior [9]. Additionally, critics note that BSL has the potential to "divert resources" [5] away from evidence based interventions like enforcement of leash laws, and public education/responsible ownership programs [5, 10].

One of the key controversies regarding BSL is the reliability of visual breed identification, which is frequently used by law enforcement and animal control officers to enforce these laws. Studies comparing DNA test results to shelter staff assessments reveal that dogs are frequently misidentified, and that agreement between observers is low [11]. This casts doubt on whether it is ethical to enact policies that can determine a dog's fate based on appearance alone. Misidentification also has the potential to compromise data on bite frequency according to breed [4]. Additionally, the reliance of some studies upon media reports to identify breeds [12] involved in incidents also has the potential to compromise epidemiological data because these reports are often unverifiable [13]. Other factors with the potential to influence bite statistics are reporting bias, population underreporting, and behavior of the stereotypical pit bull owner [14].

Studies attempting to evaluate the effectiveness of BSL have yielded inconsistent results. For example, one study evaluating results from the Dangerous Dogs Act of 1991 determined that the number of dog bite incidents remained relatively stable despite the ban's implementation two years prior [15]. Other studies have found statistically significant declines, however as this paper will discuss, such studies often have significant limitations [16].

Much of the discussion surrounding BSL involves public safety, as such the welfare of the animals involved can be overlooked. This paper will discuss various frequently cited welfare concerns, like euthanasia, long term kenneling, less socialization, etc. Prominent veterinary associations and animal-rescue organizations like the AVMA, BSAVA, RSPCA, and ASPCA echo these welfare concerns [17, 18, 19]. Public perception of BSL is a complex topic, and scientific literature reveals that members of the public hold a variety of different views. Lastly, this paper will discuss suggested alternatives to BSL.

2. Literature Review

2.1. History and Development of Breed-Specific Legislation

2.1.1 History of the Pitbull

The origins of many breeds targeted by breed specific legislation are rooted in bullbaiting and dog fighting. The pit bull, for example, was bred from crossing terriers with Old English Bulldogs, which were traditionally used as a bull-baiting dog in Britain in the 1800s. When bullbaiting was outlawed in 1835 (in the UK), practices such as rat baiting and dog fighting became popular because they were easier to hide from the authorities. Though it is true that pit bulls were initially bred as fighting dogs, they were not bred to be aggressive towards humans. In fact, this trait was actively discouraged. During the late 1800s and early 1900s, English immigrants brought their dogs with them to the United States and used them as farm/working dogs. They were even considered by some to have been "nanny dogs", and although this statement lacks any definitive or reliable sources to support it, there are plenty of old photographs depicting pit bulls and young children together. Pitbulls were also featured on American World War I and World War II recruitment posters, depicting them as strong, courageous, and patriotic [11].

Unfortunately, in the 1960-1980s dog fighting again became popular, this time bringing with it a string of attacks that were highlighted by the media. Sports Illustrated published an article in 1987 titled "The Pit Bull Friend and Killer". On the cover of the magazine was an image of a pit bull with its teeth barred and the accompanying text "Beware of this dog" [20]. The same year, Time Magazine ran an article titled "Behavior: Time Bombs on Legs" [21]. The resulting moral panic is a phenomenon that has been well documented throughout history, considering that the pit bull is not the first breed to have come under such intense scrutiny. In 1876, an article was published in the New York Times blaming the Spitz for recent instances of rabies in New York City, claiming it had a "conspicuous addiction to rabies" [22]. After WWII, the Doberman Pinchers' reputation was tarnished by often appearing next to Nazi concentration camp guards. Other vilified breeds are the Newfoundland, bloodhound, mastiffs, collies, and Saint Bernards [23].

2.1.2. Development and Spread of BSL

In the United States, the first documented legislation targeting specific breeds was an ordinance passed in Hollywood, Florida in 1980 after a 7 year old was mauled by a pit bull (though the law was overturned 2 years later) [17]. Similar legislation was passed in

Cincinnati, Ohio in 1983 after a young child was killed by his family's pit bull [24]. A year later in 1984 the city of Tijeras, New Mexico passed a ban on pit bulls after a similar attack on a young girl [23]. Many other US cities followed suit, and by 2016 an estimated 1052 cities in 36 states had passed some form of breed specific legislation [6].

BSL spread into Canada in 1990 [15], and in 1991 the United Kingdom enacted the "Dangerous Dogs Act" which banned four breeds: the Pit Bull Terrier, Japanese Tosa, Dogo Argentino, and Fila Brasileiro [7]. Norway passed "Kamphundloven" in 1991, a temporary law established due to concerns over increasing interest in dogs that are aggressive, tenacious, and willing to fight [25]. A more permanent law was passed in 2004 (Hundeforskriften), outlawing six breeds including the pit bull [26]. Victoria, Australia passed the Domestic Animals Act in 1994, banning five dog breeds (also including the pit bull). In 1999, Spain passed the Spanish Dangerous Animals Act [23], and after a string of fatal dog attacks in 2000, 15 German states banned several "fighting breeds" (among them the pit bull, American Staffordshire Terrier, and the Staffordshire Bull Terrier) [27].

Recent trends, however, indicate a shift away from such laws. The Netherlands repealed its nationwide ban in 2008 after a government review found it to have been ineffective in reducing dog bite incidents [28]. Italy repealed its ban in 2009 and replaced it with regulations that emphasize owner responsibility over breed of dog [29, 30]. In the US, several states have introduced "preemption" laws which actively prohibit municipalities from enacting breed specific legislation [23]. However, not all efforts are to repeal and prohibit BSL. Ireland, for example, banned dogs known as "XL bullys" as recently as 2024 [31]. Despite this, it is clear that there is increasing consensus among experts and the public that breed alone is a poor indicator of aggression, and that laws targeting breed are ineffective and inefficient.

2.1.3. Types of BSL

There are many different forms of BSL, ranging from nationwide bans to local ordinances. Some ban ownership or possession of certain breeds completely, while others allow ownership but place various restrictions including requiring the dog to be muzzled and leashed in public, minimum fence height, tattoos, insurance, permits [23 Schiavone]. Some laws also included limits to how many days out of the year the dog can be away from its registered address [31].

2.2. Current Prevalence of BSL

2.2.1. Geographic Distribution

Reliable and independently verified data regarding the current distribution of breed-specific legislation are limited given that there is no centralized database. Most peer-reviewed papers do not go into detail about the distribution or frequency of BSL. Therefore, the only available source of comprehensive data comes from advocacy groups like DogsBite.org. Data from such sources should be used only to produce a rough estimate of countries with BSL, due to the lack of transparency regarding data collection methods. DogsBite.org published a report in March 2025 estimating that 84 countries worldwide had enacted some form of BSL, with 74 of those countries implementing nationwide laws [3].

The same report published by DogsBite.org estimates that 2.7 billion people live in countries with nationwide laws, and that the likelihood of living under such laws varies by region [3]. **Figure 1** depicts this distribution by region.

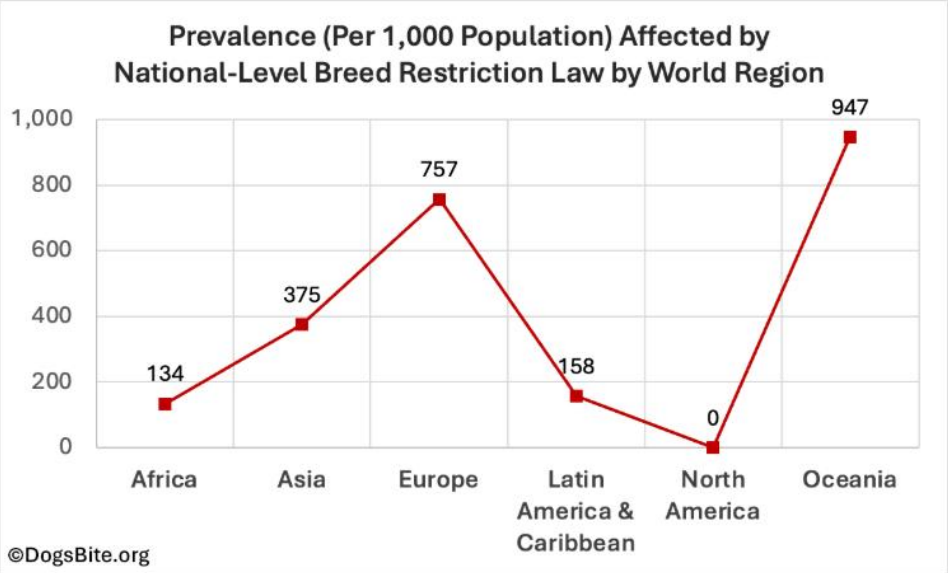


Figure 1. Prevalence of population affected by national-level breed restriction by world region [3]

2.2.2 Affected Breeds

Breeds targeted by legislation are typically medium to large sized dogs that historically have been associated with or bred for fighting or guarding purposes The most commonly affected "breed" is the pit-bull [3], though it is important to note that the term has different meanings. While some may use it to describe a single breed (the American Pit Bull Terrier), it is more

commonly used to refer to a "type" of dog and encompasses breeds with similar characteristics like large, bulky heads and muscular build. Examples of such breeds are the American Pit Bull Terrier, the American Staffordshire Terrier, and the Staffordshire Bull Terrier [32]. The lack of a consistent legal definition of a "pit bull" complicates enforcement of breed specific laws and is one of the reasons why BSL is so controversial. Some laws will mention breeds by name (Danish BSL lists American Staffordshire Terrier by name [33]), while others (such as the Dangerous Dogs Act 1991) simply state that regulated dogs are dogs "of the type known as a pit bull terrier" [7].

A review written by DogsBite.org found that all countries with nationwide laws restricted pit bulls, and many also restricted mastiffs or other fighting breeds. This report also found that most countries that placed restrictions on livestock guardian dog breeds were found in Eastern Europe and Southwest/Central Asia [3]. In some cases, other breeds such as Rottweilers, Dobermans, Dogo Argentinos, Mastiffs, and Akitas may also be affected [32]. Some of the most commonly banned breeds can be seen in **Figure 2**.



Figure 2. Photographs of the most frequent dangerous dog breeds restricted by governments worldwide [3]

2.3 Rationale, proponents, and opponents

2.3.1 Public Safety Rationale

Dog bites are a significant cause of injuries, particularly in young children. In the USA alone, hundreds of thousands of people visit emergency departments every year due to dog-bite injuries [34]. Lawmakers and other advocates will typically justify BSL as a public safety initiative designed to reduce any number of factors associated with dog bites: hospital admissions [18], number of severe dog bites [17], the total number of dog bites in a given community, or the population of legislated breeds [18]. This is often done in response to recent high profile attacks as a way of signaling to the public that authorities are taking action [23]. Unfortunately, as this paper will discuss, lawmakers and advocates will often cite data that relies upon unreliable breed identification [35] and unverifiable media reports [13] to justify their actions.

2.3.2 Arguments for and Against BSL

Proponents of breed-specific legislation argue that certain dog breeds have inherent physical or behavioral traits that make them more likely to cause serious injury [4]. They claim that banning or restricting ownership of these breeds will reduce the number and severity of dog bite attacks [32]. Opponents of breed specific legislation (such as many veterinary organizations and animal rescue organizations) argue that such laws are ethically and scientifically flawed. Detailed opinions both in favor of and against BSL will be reviewed in subsection 2.7 Opinions on breed-specific legislation.

2.4 Issues/challenges with BSL

2.4.1 The Media and Reinforcement of Negative Stereotypes

Breed specific legislation can be said to both stem from and reinforce breed stereotypes. Public perception of dog breeds is influenced by media narratives, cultural beliefs, and legislation. Studies have shown that stories of dog attacks involving pit bulls receive a disproportionate amount of media attention, and that media reports often use more graphic imagery and provocative language This type of reporting reinforces the belief that certain breeds are more dangerous. In turn, policymakers will respond to this heightened sense of fear by introducing breed-specific legislation. Once such laws are enacted they can reinforce the very stereotypes that led to their introduction. Designating specific breeds as dangerous under the law legitimizes the belief that such breeds are inherently aggressive and pose a

unique risk to the community. This in turn can affect how humans interact with these breeds, opening the door for further reinforcement of perceived stereotypes [36].

A study published in the Irish Veterinary Journal asked participants who had been bitten by a dog what they believed to be the trigger for the bite. The results showed that legislated breeds were more likely to be perceived as biting due to aggression, while non-legislated breeds were more likely to be perceived as being afraid. While it cannot be ruled out that such breeds were accurately perceived to be aggressive, the authors stress that in analyzing results of self-reported surveys (such as in their study) the effects of negative public perception must not be underestimated. Legislated breeds could have been perceived to be aggressive not because of their actual behavior but rather due to existing stereotypes of their breed. In other words, it can also not be ruled out that a individual of a legislated breed could have been perceived as aggressive while actually acting fearful, because the person interpreting the dog's behavior was aware of the breeds' aggressive reputation [37].

The same Irish study similarly suggests that people may decide how to interact with a dog based on their perception of that dog's breed, and that this may lead to misinterpretations of warning signs resulting in a bite. The authors present a scenario where a dog barks after being approached by a person. If the dog is a legislated breed, the person might interpret this an example of the "aggressive nature of such breeds", whereas if the dog was a non-legislated breed the person might completely ignore the warning [37].

2.4.2 Problems in using breed as an indicator of aggression/bite risk

2.4.2.1 Inconsistency of Empirical Evidence

The assumption that a dog's breed can reliably predict whether it will show aggression or not is one of the main justifications for breed specific legislation. However, there are many sources challenging this belief. According to the RSPCA, there is "no specific research" suggesting that dogs historically bred for fighting are "inherently aggressive", are "unique in their bite style" or have the ability to cause severe injury [18]. And indeed, other than information on how fighting dogs were historically bred, there is little (if any) reliable numerical evidence that suggests such dogs are genetically predisposed to aggression or inflict a disproportionate amount of damage.

Studies attempting to determine breed-specific bite rates, or to determine a specific breed's propensity for aggression, have yielded inconsistent and conflicting results. Additionally, many present with such significant limitations that one questions the reliability of the

findings. A few retrospective studies analyzing data from hospital and trauma centers have found that pit bulls were involved in a disproportionate number of severe or fatal attacks. For example, one US based study found that pit bulls were “responsible for the highest number of deaths” [38], while another determined that they were linked to “higher morbidity rates, higher hospital charges, and a higher risk of death” [39]. However, these studies were limited by unverified breed information, discrepancies in what constitutes a “pit bull”, and were largely based on media reporting. Additionally, there have been documented instances where a death was attributed to a pit bull, when in reality the cause of death was unrelated to the bite and occurred months afterwards [35].

On the other hand, multiple studies have found no clear link between breed and propensity for aggression. A 2008 study conducted behavioral assessments of legislated breeds, using Golden Retrievers as a control group. Results found that not only did 98.6% of dogs of legislated breeds pass the assessment, but no statistically significant difference was found when results were compared to the Golden Retrievers [40]. Temperament testing performed by the American Temperament Test Society (ATTS) revealed similar pass rates, pit bull type dogs consistently showed 85% or higher pass rate. This is comparable to, and in some cases better than, non-legislated breeds like Border Collies and Beagles [41]. Additionally, Duffy et al. (2008) showed that smaller breeds (like Chihuahuas, Dachshunds and Jack Russell Terriers) display higher levels of “owner-directed” or fear-based aggression than larger breeds, including those regulated under BSL. This same study also showed that there was significant variation in scores between individuals of the same breed. The authors therefore caution against using breed as an indicator of potential aggression [42]. These findings also underscore why, even in instances where bite-data can be considered reliable, such findings should not be generalized to all individuals of the given breed.

When evaluated as one, these conflicting findings suggest that the scientific evidence does not support the idea of predictable breed-based aggression. Most recent research instead points to individual temperament, upbringing, and environment as the key risk factors. Additionally, studies of canine behavior emphasize that aggression is not a single behavioral construct, and that it varies depending on the target (humans, dogs, etc.). Mixing these categories together can lead to misunderstandings about the behaviors of entire breeds. Breed-level statistics ignore individual differences, and their frequent use can lead to leading to unjust labeling and euthanasia of non-aggressive dogs [43].

2.4.2.2 Historical Context

Though it is true that some breeds (such as the American Pit Bull Terrier) were bred for animal fighting, it is important to note that they were not originally bred to be aggressive towards humans. In fact, such characteristics were actively discouraged as they made the dogs difficult to handle in the fighting pits. Despite this some authors argue that the style in which certain dogs bite (a so-called hold-shake-tear attack style) reflects their historical selection for fighting [14].

Characteristics such as low fight inhibition (require little provocation to initiate a fight), decreased pain sensitivity, and decreased communication (less likely to give warning signs) have been described as the result of human intervention rather than natural evolution [14, 44]. While these traits may increase the potential severity of dog bite injuries, they cannot be used as a sole indicator of whether or not a bite will occur [14].

Modern breeding of pit bull type dogs is increasingly trending towards selection for “pet quality” characteristics. This may have counteracted some of the effects of selection for fighting qualities, though such effects are difficult to prove or quantify. Trends toward more responsible ownership and ethical breeding practices have improved the behavior of many dogs within this group. Unfortunately, illegal or unregulated breeding for aggression still exists in some areas where dog fighting, criminal behavior, or the desire for intimidating “mean” dogs remain [14]. Therefore, it is possible that the behavioral variability seen in pit bull breeds may be a reflection of these opposing breeding goals.

There is also speculation that crossbreeding fighting breeds and guard breeds (such as German Shepherds or Rottweilers) could produce dogs that are aggressive towards both humans and animals. However, there is a lack of evidence that such crosses represent a significant portion of the population or that they show consistent behavior across lineages [14].

2.4.2.3 Misinterpretation of Injury Data

Conflicting findings are also found when analyzing the severity of injuries attributed to certain breeds. Some studies have reported that pit bulls are overrepresented among severe injuries requiring surgical repair [45] while others have found no significant difference in wound severity between breeds once factors such as dog size, victim age, and reporting bias are controlled [16]. Even when statistical differences can be seen, several authors note that

these findings may be a result of demographic or situational factors (such as victim age, supervision, or owner behavior) rather than inherent breed characteristics [46, 16].

A 1987 article published in *Anthrozoös* analyzed two sources regarding dog bites/attacks, and noted that although it appeared that pit bulls were responsible for a "disproportionate number of fatal attacks" (and that they were more likely to cause serious injury), it was inappropriate to extend this observation to ALL pit bulls. The authors emphasized that the bite risk of an individual dog is a combination of many factors, including genetic predisposition, early socialization, type of training (obedience, "mistraining for fighting", etc.), responsibility of the owner, and victim behavior. As such, in legislating dogs solely based on breed, lawmakers are effectively assuming that such breeds are "genetically uniform and predictably aggressive enough to warrant special restrictions" [14].

2.4.2.4 Behavioral Context

In a study published in 2013, Patronek et al. examined the relevance of human and animal factors related to dog bite fatalities in the United States. According to their findings, the following factors increased the risk of a dog bite fatality: adult or "able-bodied" individual NOT present at the time of the incident (87.1%), sexually intact dogs (84.4%), male dog (57.8% of incidents involved only male dogs, while 29.7% involved male and female dogs), dogs kept as "resident" (away from regular human interaction) dogs (76.2%), dogs kept on a chain (28.9%), owner NOT present (87.1). Of particular note is the fact that in 80.5% of incidents, 4 or more contributing factors were present, supporting the theory that one must consider many different factors when determining if a dog is likely to bite [46].

This study also found that in 37.5% of incidents, there was evidence that the dogs' owner had knowingly allowed the dog to "be a danger to others" such as having a bite history of letting the dog run loose. Additionally, in 21.1% of cases the dog had history of being neglected or abused by its owner [46]. This study provides evidence of the complex nature of dog bites, and supports the idea that breed alone is not a reliable indicator of aggression or bite risk.

2.4.3. Factors That Could Influence Bite Rates

While several studies have reported pit bulls bite more often and/or with greater severity than many other breeds [12, 39, 45], there are several factors that could affect the reliability of such data and create the false impression that certain breeds bite more frequently or severely. Lockwood and Rindy [14] suggest four main factors that could skew data: 1)

reporting bias (overreporting of bites caused by specific breeds), 2) breed identification problems, 3) population underreporting of specific breeds, and 4) ownership patterns (specifically the tendency of irresponsible owners to own certain breeds).

2.4.3.1 Reporting Bias

Bites linked to stigmatized breeds tend to get more media coverage [36]. Once a breed has been labeled as dangerous by society, incidents involving that breed are reported, remembered, and shared more frequently (are pit bulls different). This phenomenon is called reporting bias [47)].

Empirical data support this pattern. For example, Creedon and Ó'Sullivan found that legislated breeds were more likely to be reported following a bite incident compared to non-legislated breeds, even when the severity of the injury was similar [37]. Reporting bias therefore has the potential to skew bite statistics and reinforce a cycle in which media coverage influences public perception, perception influences law, and law in turn influences media coverage. Given that BSL is often implemented in the aftermath of high-profile incidents, this phenomenon can have direct legislative consequences. Studies that rely solely on police or hospital records may reflect these reporting patterns rather than true underlying bite frequencies.

2.4.3.2 Breed Identification Problems

Another major issue with BSL is the issue of breed identification. As mentioned earlier, the pit bull is not actually one breed but is often used to describe breeds with similar characteristics. Therefore, the ambiguity of the term "pit bull" means that which dogs are considered pit bulls varies across jurisdictions and even among individuals tasked with enforcement.

In most regions breed identification is done visually, meaning the dog's breed is determined based physical appearance rather than DNA testing [11]. Many studies have shown that this approach is unreliable, largely due to the subjective nature of such assessments. Voith et al. (2013) demonstrated that visual identification frequently fails to correspond with DNA results, even among experienced professionals [11]. Gunter et al. (2018) performed DNA testing of 919 shelter dogs, and compared the results to visual identification by shelter staff. They found that only 4.9% of dogs were purebred, and that most were a mix of three or more breeds. Shelter staff were able to accurately identify at least one of the breeds in 67.7% of cases, but accuracy dropped significantly down to just 10% when staff were asked to

identify two or more breeds a dogs genetic makeup. Additionally, about one-third of dogs were labelled as a breed that did not appear in their DNA test results [48].

This misidentification problem extends beyond shelters. Animal control officers, veterinarians, and law enforcement often disagree on breed classification, producing inconsistent enforcement of BSL. The unreliability of breed identification data was one of the reasons the CDC stopped including the breed of dog involved in their statistics on fatal dog attacks, citing "enormous difficulties in collecting dog bite data". According to the CDC, there is no single reporting system for dog bites and incidents are reported to so many different organizations that it becomes extremely difficult to accurately analyze the relevance of breed [17].

Patronek et al. (2013) further questioned the validity of using media reports as an accurate depiction of dog breed. They noted that "the source of breed descriptors in media reports is usually unknown, potentially being neighbors, first responders, or other witnesses who may or may not have any first-hand knowledge of the dog or dogs involved in an incident." [46].

The consequences of misidentification are profound. Dogs may be seized or euthanized under BSL despite lacking a genetic relationship to legislated breeds, and researchers relying on such data may produce inaccurate risk estimates that perpetuate stigma and poor policymaking.

2.4.3.3 Population Underreporting

Reliable bite rate estimation requires accurate data on both the number of bites and the population size of each breed. Underreporting of dog breed populations, particularly those of breeds often labeled as dangerous, can inflate bite rates. For example, if pit bulls are overrepresented in incident reports but undercounted in the total dog population, then their calculated bite rate will appear higher than it actually is [14].

Some US studies attempting to evaluate breed specific bite frequency have used American Kennel Club (AKC) registrations to estimate the population of a given breed. However, this approach is problematic for breeds like pit bulls, many of which are unregistered or mixed breed. As Lockwood and Rindy note, owners of stigmatized dogs may be less likely to license or register their animals, particularly in areas with breed bans or insurance requirements [14]. Additionally, informal or illegal breeding in some communities further complicates accurate population tracking. Without a comprehensive, standardized canine census, breed-based bite-rate comparisons are inherently unreliable [49].

2.4.3.4 Behavior of the stereotypical pit bull owner

Another factor that has the potential to influence dog bite statistics is behavior and demographics of dog owners. Lockwood and Rindy suggest that higher bite rates attributed to pit bulls may be more of a reflection of the owners rather than the dogs themselves. They argue that the use of pit bulls as status symbols, as well as their historical association with dog fighting and criminal activity, has led to patterns of ownership that are characterized by poor or improper training, lack of supervision, inadequate socialization, and even abuse/neglect. Though this does not necessarily apply to the majority of pit bull owners, such patterns nevertheless contribute to negative public perception of such breeds and contribute to disproportionate representation in bite statistics [14].

2.4.3.5 Misuse and Misinterpretation of Bite Data in Policy Advocacy

Equally as concerning as the methodological problems in studies attempting to determine which breeds bite more frequently or severely (or evaluating effectiveness of BSL), is the fact that such studies are cited by pro-BSL advocacy groups as clear cut evidence that pit bulls are uniquely dangerous and that BSL works. For example, DogsBite.org frequently references studies that report higher frequency and injury severity in bites attributed to pit bull type dogs [50]. As mentioned previously, many such studies have methodological problems and limitations, something that DogsBite.org is either unaware of or intentionally fails to disclose, effectively preventing the reader from making an informed decision on such matters. Additionally, they also cite the Raghavan et al. (2012) Canadian study on dog bite hospitalizations [16] as evidence that BSL works, stating that "Well enforced breed-specific pit bull laws absolutely reduce damaging attacks by pit bulls" Again, the site does not mention any limitations of this study [51], despite the authors themselves stating that their findings could not establish causation due to confounding variables and reporting bias and cautioning against using their findings as sole justifications of such bans [16]. These examples highlight how information can be taken out of context and used to make conclusions it is not qualified to make. Such inappropriate conclusions can then in turn be used as justification for breed bans, as well as fueling negative breed stereotypes.

A further limitation in many bite studies is missing or incomplete breed data. For example, a study published in the Journal of Craniofacial Surgery study collected data on dog bites involving children that presented to a US trauma center over a six year period. They found that in cases where the breed of dog could be identified, 47.9% were caused by a pit bull,

and that the pit bull was the responsible breed in 52.5% of cases that required surgery [52]. This information was cited by DogsBite.org, an advocacy group that argues in favor of breed bans [50]. What DogsBite.org did not mention was that the breed of dog could NOT be identified in over half of the reported incidents (64.1%), and that the authors noted that the "sheer volume of unreported breeds" meant that it could not be accurately determined which dogs attack more frequently. This source also noted that due to the increased media attention surrounding pit bulls (and hence that pit bulls may be easier to remember), recall bias may have affected the data [52].

2.5 Effectiveness of BSL

Evaluating the effectiveness of breed specific legislation (BSL) is difficult. Issues such as inconsistent methods, unreliable breed identification (and/or lack of breed data), and factors such as public awareness campaigns, enforcement intensity, and demographic changes can all influence data. Despite this there are a number of studies from Europe and North America that have attempted to determine if BSL reduces the number or severity of dog bites.

In 1996, researchers conducted a study of mammalian bites at an emergency department in Scotland. As part of this study, they evaluated and compared the number of dog bites presented to this emergency department before and after the implementation of the Dangerous Dogs Act of 1991. In a 3 month period before the ban, 99 dog bites (3% from pit bulls) were recorded. Two years after the implementation of the ban, another 3 month period was evaluated where it was found that the number of dog bites had remained the same, with the percentage of pit bull bites only slightly higher at 5% [15]. According to the RSPCA as of 2016, 30 people have been killed in "dog-related incidents" but only 9 of those were attributed to pit bull type dogs [18].

Comparable findings have been observed elsewhere in Europe. A similar study evaluated the Spanish Dangerous Animals Act, this time evaluating 5 year periods before and after the ban and found that it did not have a significant effect on the number of dog bites requiring medical attention. Additionally, the ban had no significant on breed distribution (regarding bites) as legislated breeds were responsible for only 4% of bites both before and after the implementation of the ban. While breed was recorded in just over half of all cases (representing an important limitation), the study concluded that the Act had not produced a demonstrable reduction in dog-bite incidents [53].

Other studies have found more nuanced results, highlighting the difficulties in accurately evaluating the effects of breed specific legislation. One such study attempted to evaluate whether or not BSL had any effect on hospitalizations caused by dog bites in the Canadian province of Manitoba. The study found that when municipalities with BSL were compared to those without BSL, a statistically significant decline was seen (rates were 18% lower in jurisdiction with BSL), though it is also relevant to note that declines were also seen in areas without BSL. However, the study also found that when municipalities were compared to their own "pre-BSL" rate (i.e. used as their own control), no notable decline was seen. The authors themselves state several significant limitations with their study. Firstly, the population change of banned breeds and the portion of bites caused by banned breeds was not evaluated. Secondly, the comparison of municipalities with and without BSL was done in a "quasi-experimental" manner meaning that while inferences can be made regarding the association between BSL and dog bite hospitalizations, no definitive cause-and-effect relationship can be established [16]. Additionally, an article in the Irish Veterinary Journal discussed the Manitoba study and pointed out that the implemented legislation also included elements targeting dangerous dogs in general, and that it would be hard to determine which part of the legislation led to the reduction in bites [37]. The Manitoba study is therefore more suited to be used as a basis for improving future BSL evaluations, rather than to be used as direct evidence of cause and effect. Another Canadian study published in 2013 found no difference in the rate of dog bites between municipalities that did and did not have BSL in place [54].

A study evaluating the effects of the Dutch breed ban also demonstrates the nuances in evaluating the effectiveness of BSL. Rather than directly comparing total bite incidents and breed specific bite rates from before and during the ban, researchers used population surveys to estimate current bite numbers. A notable strength of this study is that it also generated both breed population data as well as determined the number of bites attributable to a given breed. However, the lack of data from before the ban is a key limitation, as it prevents a definitive conclusion on the ineffectiveness of BSL. Regardless, the study estimated that approximately 136 000 bites occurred yearly during the ban, suggesting that dog bites were still a significant problem. Researchers also determined that it was not just a few breeds that were responsible for all the bites, but rather a wide range of breeds. Moreover, many of the most popular dog breeds were frequently implicated. The sheer number of dogs that would need to be removed to increase public safety makes BSL an impractical solution. The

authors therefore concluded that BSL had not succeeded in its goals to reduce dog bites and improve public safety, not because its ineffectiveness could be directly proven but because no clear benefit could be demonstrated [55].

Studies from Italy provide additional context. A study of the effects of breed specific legislation in Florence, Italy did reveal a decline in the number of bites, however the authors of the study point out that this steady downward trend in dog bites was already present years before the ban. This study also found that there was no difference in breeds involved before and during the ban [56]. Cattarosi and Martuzzi analyzed 662 dog bite incidents in Italy and found that most of the breeds listed as "dangerous" under Italian BSL (including pit bulls) had few or no recorded bite incidents, while several non-legislated breeds demonstrated higher bite rates. A limitation of the study is that it was limited to purebred dogs and relied on cases reported to veterinary behavioral consultants. Despite this the study still demonstrates that legislated breeds were not the breeds most frequently involved in bites, and hence BSL cannot be shown to significantly reduce bite incidents [57].

Lastly, some studies have even found that hospitalizations increased following implementation of breed bans. For example, Ó Súilleabháin et al. found that in the 15 years following the implementation of the 1998 breed ban in Ireland, hospitalizations due to dog bites increased by 45% (with a 21% increase in rate) [58].

2.6 Impact of BSL on Animal Welfare

With public safety dominating much of the discussion surrounding BSL, the welfare of affected animals is often overlooked. Such laws have the potential to have serious implications on the lives of such dogs. Direct consequences of BSL (which include seizure, kenneling, lack of access to veterinary care, and euthanasia) arise from the enforcement of these laws. Indirect consequences are the result of how BSL influences public perception of legislated breeds, thereby influencing their behavior in interacting with such dogs and their willingness to own one.

2.6.1 Direct Consequences

In a letter submitted to the *Veterinary Record*, veterinarians in the UK have voiced concerns over the lack of research into the welfare effects of kenneling dogs seized under the Dangerous Dogs Act, stating that most existing research targets either the legality of the laws themselves or the potential changes to dog bite rates associated with BSL. The authors call into question the effects extended stays in shelters can have on the animal's well-being,

as well as whether or not such circumstances are compatible with adequate veterinary care. They also note that the amount of exercise and socialization received likely depends on the expertise of the staff and information they received about the dog prior to entering their care, which makes it difficult to ensure a consistent standard of care for such animals [59].

An alarming case study demonstrates this concern. A pit bull was seized under the Dangerous Dogs Act (DDA). A requested behavioral assessment was not performed until the dog had been in "solitary confinement" for 8 months. The dog presented with "severe neurological deficits" that had been continuously misinterpreted by shelter staff as aggression. After lacking proper veterinary care for months, an MRI was performed and "revealed a subarachnoid cyst at C2". The cyst was determined to be inoperable, and the dog was euthanized [60].

The RSPCA's report Breed-Specific Legislation: A Dog's Dinner highlights the stress associated with extended kenneling and the lack of rehoming options for legislated types. According to the report, because the Dangerous Dogs Act does not allow for rehoming of banned types, the RSPCA has had to euthanize 366 dogs over a two year time span [18]. Additionally, some shelters may not accept surrenders of banned breeds, or allow the rehoming of such breeds [37]. Research into the long-term effects of living in shelter environments has shown that extended stays are associated with elevated cortisol levels [61] and development of stereotypies such as "increased autogrooming, paw lifting, vocalizing, repetitive behavior and coprophagy". Additionally, dogs living in small areas or with limited social experiences exhibit more aggressive and uncertain behaviors [62].

Data from US municipalities with BSL further demonstrate why such issues are of concern. An evaluation of the effects of Denver, Colorado's breed ban found that legislated dog breeds stayed in shelters 61% longer than non-legislated breeds. The evaluation also found that from 1989 to 2017, 4,588 pit bulls (58.9% of all pit bulls impounded) were euthanized under the city's BSL law [63].

2.6.2 Indirect Consequences

While it is clear that BSL contributes to increased euthanasia rates and longer shelter stays, such outcomes are multi-factorial and it is not always clear whether it is a direct or indirect consequence of legislation. For example, owners may be forced to surrender their dogs to shelters [18], or they may surrender them because of housing restrictions [64]. Furthermore,

the stigma around such breeds may contribute to lower adoption rates and consequently increased euthanasia rates [18].

Recent studies have demonstrated such complexities in evaluating the effects of BSL. In 2024, Walker and Powell compared the outcome and "length of stay" for legislated and non-legislated breeds. Their initial results showed that legislated breeds spent significantly longer time in shelters and had higher euthanasia rates. However, because a dog's body weight can influence outcomes (larger dogs may be considered less adoptable), the authors adjusted the results to account for body weight. After this adjustment, there was no statistically significant difference in outcome and "length of stay" between groups, suggesting the possibility that some of the outcomes were the result of body weight not of being a legislated breed. Complicating this analysis is the fact that legislated breeds were on average heavier than non-legislated breeds, making it hard to separate the effects of legal issues from the effects of weight. Regardless, among dogs that were not euthanized, legislated breeds still spent more time in the shelter and were less likely than non-legislated breeds to be adopted [65].

A study of animal shelters in the United States found that pit bull type dogs were twice as likely as other breeds to be euthanized (13% vs. 5%), and were also less likely to be adopted than other breeds (67% vs. 73%) [64]. Additional evidence from a study of three New York animal shelters perfectly demonstrates how public perception can influence the lives of stigmatized breeds. The study found that when breed labels were removed from a dog's kennel card, the adoption rate of pit bulls rose from 52% to 64%. This corresponded with a 12% reduction in the euthanasia rate [66].

BSL also affects the welfare of legislated breeds in ways other than euthanasia and extended shelter stays. According to the American Veterinary Society of Animal Behavior, owners of banned breeds may be more likely to avoid taking their dog to the veterinarian (especially for routine vaccinations such as rabies) to avoid the dog being seized by law enforcement. They may also avoid properly training or socializing their dogs, which is linked to a higher risk of behavioral problems (like aggression and fear) as an adult [2].

2.7 Opinions on Breed Specific Legislation

2.7.1 Veterinary Health Professionals

Multiple veterinary associations do not support breed specific legislation including: the American Veterinary Medical Association (AVMA) [67], the American Veterinary Society

of Animal Behavior (AVSAB) [2], the British Veterinary Association (BVA), the British Small Animal Veterinary Association (BSAVA) [19], and the Federation of Veterinarians of Europe (FVE) [68].

The BVA and the BSAVA published a position statement in which they lament the "lack of scientific evidence" to support BSL, and that it "distracts from the real issues behind dog control and dog related injuries" [19]. The AVMA similarly claims that breed bans are a "simplistic answer to a far more complex social problem". They believe that there are multiple problems with breed specific legislation, including the difficulties in accurately identifying a dog's breed and the fact that, due to unreliable or absent data, it is often impossible to calculate a breed specific bite rate. They also note that breed bans do not address "irresponsible pet ownership", and that banning certain breeds deemed dangerous can give the public a false sense of security [67], a sentiment echoed by the AVSAB [2]. While breed is one factor, the "impact" of other factors (such as training, sex, spay/neuter status, socialization, target (owner, stranger, etc.), and situational context) means that breed has no "significant predictive value" on its own when determining a dog's likelihood of aggression/biting [69].

Despite many veterinary organizations disapproving of BSL, there are only a few studies that analyze the individual veterinarian's opinion. A study done in the United States in 2019 found that the majority of veterinarians did not agree with the statement "banning specific breeds of dogs improves public safety", and agreed that doing so "creates an animal welfare issue". The study also looked at to what degree veterinarians would endorse various public safety measures. Among the top three were "public education about animal behavior" (90%), "stricter leash laws" (79.9%), and "public education about animal welfare" (78.4%). Veterinarians were less likely to endorse alternatives such as mandatory spay/neuter (19.6%), registration requirements (13.5%), and muzzling in public (6.1%) of certain breeds [70].

A similar survey conducted in Turkey in 2023 found that 29.23% of veterinarians approved a breed ban, while 45.64% approved of restrictions in place of a breed ban. 25.13% did not approve of restrictions or a breed ban [71].

2.7.2 Other animal-related organizations

Animal welfare organizations such as the RSPCA, ASPCA, and Humane World for Animals (previously the Humane Society of the United States), oppose BSL due to ethical and

welfare concerns. They argue that BSL punishes well-behaved dogs and responsible owners without addressing the root causes of aggression (such as neglect, poor supervision and lack of training). The RSPCA also addresses the negative impact on the welfare of legislated breeds, such as higher euthanasia rates, increased time spent in shelters, lack of access to proper care. They also shed light on the distress caused by confiscation and euthanasia of dogs that have never shown aggressive behavior [18, 72, 73].

Survey of animal control officers in Ireland found that over half of the officers felt that BSL is effective (59%) and that legislated breeds were capable of inflicting greater harm (56%). However, only 19% felt that such breeds were more aggressive [37].

2.7.3 General public

Studies of public perception of breed-specific legislation have revealed that the public hold a variety of different opinions. Many people believe that some breeds (such as pit bulls) pose a higher risk to public safety than others and therefore that laws regulating these breeds are warranted [23]. Public concern is often heightened in the aftermath of high profile attacks attributed to such breeds in large part as a result of the increased media attention such attacks receive. From a politician's perspective, BSL may be a way of validating the concerns of potential voters, regardless of whether or not those concerns are backed by conclusive scientific evidence [74].

Research also reveals that the general public, much like the "experts" discussed in previous sections, frequently misidentifies a dog's breed. For example, Gunter at al. 2016 found that inaccurate breed recognition is common among the general public [66]. It is therefore likely that many members of the public do not adequately understand which types of dogs are actually regulated under BSL.

Multiple studies of public opinion in the United States and Europe have shown that those with limited personal experience with pit bull type dogs are more likely to support breed bans, often citing safety concerns and negative media portrayals [75, 76]. Kogan survey of US adults found that those who had previously interacted with pit bull type dogs reported more positive impressions of such dogs and were less supportive of breed bans. In contrast, those with limited experience with pit bulls were more likely to endorse breed bans or restrictions. Proponents will also argue that enforcing BSL laws is easier than evaluating dog on a case by case basis [55, 74].

2.8 Alternatives to Breed-Specific Legislation

Given the limitations and welfare concerns related to breed-specific legislation, many authors and organizations have argued that more effective and ethical approaches should focus on the main risk factors for dog bites: human behavior, dog management, and education.

One important area is education on dog behavior and safe interactions between humans and dogs, especially for children. Studies show that many children find it hard to interpret canine body language, including fear or aggression. This difficulty can increase risk of bites during everyday interaction. For example, one study found that only about 61% of children aged 7-12 were able to recognize aggressive behavior in dogs. This suggests there is significant room for improvement in basic safety education [77]. These findings support the idea that structured programs for schools, parents, and dog owners could help reduce conflicts between dogs and children and prevent bites.

Epidemiological studies of serious and fatal dog bites highlight the importance of ownership, supervision, and control, rather than breed, as key factors in risk. In their well-known review of fatal dog attacks in the United States from 1979 to 1998, Sacks et al. found that a large number of incidents involved inappropriate human or dog behaviors just before the attack. They pointed out that better supervision and management could have prevented many of these cases. About 24% of fatalities involved owned dogs that were roaming unsupervised off their owner's property. This suggests that strong leash laws, fencing requirements, and enforcement of "no free roaming" rules could significantly help prevent bites. In contrast, fewer than 1% of fatal incidents in that study involved leashed dogs on their owner's property. This shows the protective effect of basic restraint and responsible handling [12]. Based on these findings, several authors have argued that legal frameworks should focus on owner responsibility and control. This includes secure confinement, proper supervision of interactions with children, and penalties for repeat violations, rather than blanket bans on certain breeds.

Lockwood and Rindy suggest moving away from breed-based measures to focus on behavior and owner responsibility. In their analysis of the pit bull controversy, they recommend strengthening and enforcing laws against dog fighting to lessen the "macho" image linked to fighting breeds. They also propose expanding animal control laws to identify problem dogs and careless owners before serious incidents happen. Additionally,

they call for public education campaigns on responsible ownership and preventing bites [14].

A similar view appears in the report from the AVMA Task Force on Canine Aggression and Human-Canine Interactions. It clearly discourages relying on breed bans and instead supports a community-based approach to preventing dog bites. The task force outlines several strategies: 1) clear leash and confinement laws to prevent bites from loose dogs, 2) licensing systems that help with identification, ensure rabies vaccination, and provide population data, 3) vaccination requirements, and 4) early intervention and monitoring of dogs that have aggressive histories. The document states that BSL laws are inappropriate and ineffective. These laws assume that all dogs of a certain breed are dangerous, ignore that most dogs are not a problem, and do not hold owners appropriately accountable. The task force also points to examples where proactive focus on bite prevention measures led to significant reductions in bite incidents at the community level [9].

Ledger et al. argue that a more realistic way to reduce dog bites is through targeted breeding, early socialization, and responsible ownership, instead of imposing breed bans. In their review of BSL laws and alternatives, they highlight that aggressive individuals within a breed are often related. Several studies indicate a hereditary aspect of aggression, suggesting that dogs with a known history of aggression should not be bred. At the same time, they stress the need for structured socialization of puppies, proper training, and management practices that reduce fear and frustration. All these factors can affect the development and expression of aggressive behavior [27].

3. Objectives

The main objective of this study was to compare the opinions of individuals involved in the field of veterinary medicine (veterinary health professionals, VHPs) to those of the general public regarding breed-specific legislation and its influence on affected breeds. Collecting and evaluating these opinions is relevant because both veterinary health professionals and the general public can influence policy changes. VHPs can provide expert/science-based opinions, while the general public can provide insights regarding perception and societal factors that influence policy decisions. The ability to influence policy can have a direct impact on public safety and the welfare of animals. Directly comparing opinions from various stakeholders allows for visualization of any differences and can further the discussion surrounding BSL by identifying gaps in communication.

This study aims to determine whether individuals with veterinary education/experience have more positive or negative views of BSL compared to the general public, especially as it pertains to effectiveness and impact on the welfare of affected breeds. This study will evaluate which factors (such as personal experience with pit bulls, breed ownership and preferences, perceived reliability of media sources, fear of specific breeds, association with key words, and beliefs regarding the relative importance of breed compared to environmental and human factors) have an influence on respondents' opinions of BSL. To address these aims, this study will attempt to answer to main questions: 1) Do veterinary health professionals and the general public differ in their opinions regarding the effectiveness and welfare implications of breed-specific legislation? And 2) If differences are seen, which variables are responsible for this difference?

4. Materials and Methods

4.1 Questionnaire Composition and Distribution

It was determined that the best method of investigating these questions was to send out a questionnaire via Google Forms. The survey contained a brief introduction, where the purpose of the survey was described. A thesaurus was also included to avoid confusion regarding which breeds were to be considered pit bulls, thereby enhancing the reliability of the results. In the thesaurus was a photo and distinguishing characteristics (**Figure 3**) of three breeds commonly considered a pit bull: the American Pit Bull Terrier, the American Staffordshire Terrier, and the Staffordshire Bull Terrier. Participants were also given a brief description of what BSL is and what breeds are affected, to ensure a basic understanding of the term.

American Pit Bull Terrier (APBT)	**American Staffordshire Terrier (AmStaff)**	**Staffordshire Bull Terrier**
		
Height: 43-53 cm (17-21 in) Weight: 14-27 kg (30-60 lb) Distinguishing characteristics: Slender build Can be taller than the AmStaff Nose can be any color	Height: 43-48 cm (17-19 in) Weight: 18-32 kg (40-70 lb) Distinguishing characteristics: Stocky build Black nose	Height: 36-41 cm (14-16 in) Weight: 11-17 kg (24-38 lb) Distinguishing characteristics: Stocky build Smaller than the APBT + AmStaff Broad head with pronounced cheek muscles

Figure 3. Thesaurus with pictures and brief descriptions of breeds often considered pit bulls [78, 79, 80, 81]

The questionnaire was distributed through various online platforms to reach both veterinary health professionals and members of the general public. A link (alongside a brief explanation) was shared in Facebook groups related to dogs, on the researcher's personal Facebook and Instagram pages, within University Facebook and WhatsApp groups, and through personal contacts. Additionally, emails were sent to several veterinary clinics, veterinary associations, and animal rescue organizations. Although efforts were made to

obtain a broad and diverse sample, response rates varied. Veterinary associations did not respond to email requests, and only one rescue organization agreed to share the survey with their staff. As a result, many of the veterinary respondents were reached through university networks, which may have led to a higher proportion of students and new graduates in the veterinary health professional category. Similarly, despite being posted in multiple Facebook groups and shared widely on social media, the general public response rate remained low. These factors are acknowledged as potential limitations of this study. Descriptive statistics were generated using Microsoft Excel, while statistical analysis was conducted using Fisher's exact test and the Fisher-Freeman-Halton exact test. The significance value was set at $p < 0.05$.

4.2 Questionnaire Contents

The survey began with demographic/background related questions. The rest of the survey was divided into three sections based on occupation: veterinary health professionals, animal-related work, and "other" (representing the general public). Google Forms allowed for each respondent to be directed to the correct sections according to their chosen occupation category, ensuring that everyone only filled out one section. Questions were both closed-ended (multiple-choice and Likert scale [82]) and open-ended, this was done to allow for both quantitative and qualitative analysis. Many of the questions were identical between groups to allow for comparison of results.

4.2.1 Demographics and Background Questions

1. What is your gender?
    - Male
    - Female
    - Prefer not to say/other
2. What is your age group?
    - Under 18
    - 18-29
    - 30-44
    - 45-59
    - 60+
3. Do you have any children?
    - Yes

- No

4. What is your country of origin/residence? If the two are different, please choose the location you have spent the most time in. *(Please write the country only)*
   - Open-ended question
5. Which of these categories does your occupation belong to?
   - Veterinary Health Professional (Veterinarian, technician/nurse, assistant, student)
   - Animal related work (dog trainer, shelter worker, animal control officer, etc.)
   - Other

4.2.2 Occupation-based Questions

4.2.2.1 Veterinary Health Professional Questions

1. Please select the option that best describes your specific occupation.
   - Veterinarian
   - Veterinary Technician/Nurse
   - Veterinary Assistant
   - Veterinary Student
2. Are you currently practicing/working in this field?
   - Yes
   - No
   - I'm a student
3. What is your area of practice? If multiple, please choice the option you spent the most time with.
   - Small Animal
   - Equine
   - Farm Animal
   - Exotic Animal
   - I'm a student
4. Main country of practice *(Please write country only).*
   - Open-ended question
5. How often do you work with pit bulls?
   - Very often (daily)
   - Often (few times a week)
   - Occasionally (few times a month)

- Rarely (few times a year)
- Never

6. Have you ever owned a pit bull type dog?
   - Yes
   - No
7. Do you currently own a dog?
   - Yes
   - No
8. If yes, what breed or breeds do you own currently?
   - Open-ended question
9. If you do not currently own a dog, but have previously owned one, what breed was it?
   - Open-ended question
10. Would you consider owning a pit bull type dog?
    - Yes
    - No
11. What is the first thing that comes to mind when you hear "breed specific legislation"? *(Please mention a few words or a short sentence regarding what you associate with BSL or the emotion it evokes.)*
    - Open-ended question
12. What is the first thing that comes to mind when you hear "pit bull type dog"? *(Please mention a few words or a short sentence regarding what you associate with pit bull type dogs or the emotion they evoke.)*
    - Open-ended question
13. Do you believe BSL is effective in reducing the number of dog bite related injuries and deaths?
    - Yes
    - No
14. Can you think of any alternatives to BSL that would be more effective in reducing the number of dog bites?
    - Yes
    - No
15. If yes, please briefly list some alternatives.
    - Open-ended question

16. Do you believe a dog's breed is an important factor when evaluating bite-risk?
    - Yes
    - No
17. In your opinion, is a dog's breed more, less, or equally important compared to other factors such as responsible ownership, training, and socialization?
    - More
    - Less
    - Equally
18. In your opinion, does BSL impact the welfare of affected breeds?
    - Yes
    - No
19. If yes, how?
    - Open-ended question
20. Which of the following factors do you believe has most significantly impacted your opinion on BSL?
    - Veterinary related education
    - Social media/news articles
    - Personal experiences with affected dog breeds
21. Which of the following factors do you believe is the most influential factor in the passing of BSL?
    - Dog bite statistics
    - Public perception/demand
    - Media coverage
    - Political pressure
22. Do you believe that media/news articles are reliable sources when determining the breed or type of dog involved in an attack?
    - Yes
    - No
23. Are there any dog breeds you are afraid of/keep a distance from?
    - Yes
    - No
24. If yes, please list the breeds and explain why.
    - Open-ended question
25. Overall, do you support or oppose BSL?

- Strongly support
- Somewhat support
- Neutral
- Somewhat oppose
- Strongly oppose

4.2.2.2 Animal-related Work Questions

1. Please select the option that best describes your specific occupation.
   - Dog trainer
   - (Animal) shelter worker
   - Animal control officer
   - Other
2. If you chose “other”, please specify.
   - Open-ended question
3. Which country have you worked in most often? *(Please write country only).*
   - Open-ended question
4. How often do you work with pit bulls?
   - Very often (daily)
   - Often (few times a week)
   - Occasionally (few times a month)
   - Rarely (few times a year)
   - Never
5. Have you ever owned a pit bull type dog?
   - Yes
   - No
6. Do you currently own a dog?
   - Yes
   - No
7. If yes, what breed or breeds do you own currently?
   - Open-ended question
8. If you do not currently own a dog, but have previously owned one, what breed was it?
   - Open-ended question
9. Would you consider owning a pit bull type dog?

- Yes
- No

10. What is the first thing that comes to mind when you hear “breed specific legislation”? *(Please mention a few words or a short sentence regarding what you associate with BSL or the emotion it evokes.)*
    - Open-ended question
11. What is the first thing that comes to mind when you hear “pit bull type dog”? *(Please mention a few words or a short sentence regarding what you associate with pit bull type dogs or the emotion they evoke.)*
    - Open-ended question
12. Do you believe BSL is effective in reducing the number of dog bite related injuries and deaths?
    - Yes
    - No
13. Can you think of any alternatives to BSL that would be more effective in reducing the number of dog bites?
    - Yes
    - No
14. If yes, please briefly list some alternatives.
    - Open-ended question
15. Do you believe a dog’s breed is an important factor when evaluating bite-risk?
    - Yes
    - No
16. In your opinion, is a dog’s breed more, less, or equally important compared to other factors such as responsible ownership, training, and socialization?
    - More
    - Less
    - Equally
17. In your opinion, does BSL impact the welfare of affected breeds?
    - Yes
    - No
18. If yes, how?
    - Open-ended question

19. Which of the following factors do you believe has most significantly impacted your opinion on BSL?
    - Education/training
    - Social media/news articles
    - Personal experiences with affected dog breeds
20. Which of the following factors do you believe is the most influential factor in the passing of BSL?
    - Dog bite statistics
    - Public perception/demand
    - Media coverage
    - Political pressure
21. Do you believe that media/news articles are reliable sources when determining the breed or type of dog involved in an attack?
    - Yes
    - No
22. Are there any dog breeds you are afraid of/keep a distance from?
    - Yes
    - No
23. If yes, please list the breeds and explain why.
    - Open-ended question
24. Overall, do you support or oppose BSL?
    - Strongly support
    - Somewhat support
    - Neutral
    - Somewhat oppose
    - Strongly oppose

4.2.2.3 "Other" Questions

1. What is your current occupation? (Please specify job title only)
    - Open-ended question
2. Have you received any formal or non-formal education on dogs?
    - Yes
    - No
3. If yes, please specify.

- Open-ended question

4. Have you had any experience working with pit bulls? (e.g. shelter volunteer)
   - Yes
   - No
5. Have you ever owned a pit bull type dog?
   - Yes
   - No
6. Do you currently own a dog?
   - Yes
   - No
7. If yes, what breed or breeds do you own currently?
   - Open-ended question
8. If you do not currently own a dog, but have previously owned one, what breed was it?
   - Open-ended question
9. Would you consider owning a pit bull type dog?
   - Yes
   - No
10. What is the first thing that comes to mind when you hear "breed specific legislation"? *(Please mention a few words or a short sentence regarding what you associate with BSL or the emotion it evokes.)*
    - Open-ended question
11. What is the first thing that comes to mind when you hear "pit bull type dog"? *(Please mention a few words or a short sentence regarding what you associate with pit bull type dogs or the emotion they evoke.)*
    - Open-ended question
12. Do you believe BSL is effective in reducing the number of dog bite related injuries and deaths?
    - Yes
    - No
13. Can you think of any alternatives to BSL that would be more effective in reducing the number of dog bites?
    - Yes
    - No

14. If yes, please briefly list some alternatives.
    - Open-ended question
15. Do you believe a dog's breed is an important factor when evaluating bite-risk?
    - Yes
    - No
16. In your opinion, is a dog's breed more, less, or equally important compared to other factors such as responsible ownership, training, and socialization?
    - More
    - Less
    - Equally
17. In your opinion, does BSL impact the welfare of affected breeds?
    - Yes
    - No
18. If yes, how?
    - Open-ended question
19. Which of the following factors do you believe has most significantly impacted your opinion on BSL?
    - Social media/news articles
    - Personal experiences with affected dog breeds
    - Information from veterinarian or dog trainer
20. Which of the following factors do you believe is the most influential factor in the passing of BSL?
    - Dog bite statistics
    - Public perception/demand
    - Media coverage
    - Political pressure
21. Do you believe that media/news articles are reliable sources when determining the breed or type of dog involved in an attack?
    - Yes
    - No
22. Are there any dog breeds you are afraid of/keep a distance from?
    - Yes
    - No
23. If yes, please list the breeds and explain why.

- Open-ended question

24. Overall, do you support or oppose BSL?
    - Strongly support
    - Somewhat support
    - Neutral
    - Somewhat oppose
    - Strongly oppose

5. Results

5.1 Demographics

A total of 79 responses were received. Respondents were asked which category their occupation fell into: 45 (57%) answered veterinary health professional (VHP), 27 (34.2%) answered other, and 7 (8.9%) animal-related work. Within the VHP category, 17 (37.8%) are veterinary students, 15 (33.3%) are veterinarians, 12 (26.7%) are veterinary technicians/nurses, and one (2.2%) is a veterinary assistant. Due to the small sample size for animal-related work, results were combined with the VHP category for comparative analysis to the general public. Animal-related work respondents were added to the VHP category instead of the "other" category because their experience with animals distinguishes them from the general public and is more aligned with the VHP category.

5.1.1 Gender

Respondents were overwhelmingly female (87.3% female vs. 12.7% male). Distribution was similar between and within groups: 90.4% of VHPs and 81.5% of the general public was female, while 9.6% of VHPs and 18.5% of the general public was male. No respondents chose the "prefer not to say/other" answer choice. The five males within the VHP category were three students, one veterinarian, and one assistant.

5.1.2 Age

The highest proportion of respondents (43%) were between 18-29 years, then 30-44 years (35.4%), followed by 60+ years (11.4%) and 45-59 years (10.1%). VHPs tended to be younger than the general public. 55.8% of respondents were aged 18-29, 36.5% were aged 30-44, 7.7% were aged 45-59, and none were aged 60+. In comparison, the age distribution of the general public was more evenly distributed. 18.5% were aged 18-29, 33.3% were aged 30-44, 14.8% were aged 45-59, and 33.3% were aged 60+.

Within the VHP category, the majority (94.1%) of veterinary students were aged 18-29. Veterinarians and technicians/nurses showed a wider age distribution, however most (86.7% and 91.7%, respectively) were aged 18-29 or 30-44. The single assistant was aged 18-29. The age distribution of animal-related workers was similar to veterinarians and technicians/nurses, with 85.7% in the 30-44 age group and one respondent in the 45-59 age group.

5.1.3 Children

Most respondents 31.6% did not have children, though more respondents in the general public had children compared to VHPs. In the VHP category, 76.9% of respondents had no children while 23.1% said they did. Among the general public, 51.9% had no children, while 48.1% did. Within the VHP category, veterinarians and technicians/nurses were more likely to report having children. 33.3% of veterinarians and 50% of technicians/nurses had children. Only one animal-related worker (14.3%) reported having children, while no assistants or students had children.

5.1.4 Country of Origin/Residence

Participants were from a total of 19 different countries (for the purposes of this analysis, all respondents who answered UK, or England; Scotland, and Wales were combined into one category; the UK) the top three being the UK (25.3%), USA (16.5%), and Norway (19.0%). Other countries were Australia, Austria, Denmark, France, Germany, Hungary, Ireland, Israel, Korea, Lebanon, Malta, Morocco, Qatar, Slovakia, South Africa, and Switzerland.

5.2 Questions Specific to Veterinary Health Professionals

5.2.1 Veterinarians, Veterinary Technicians/Nurses, Veterinary Assistants, Veterinary Students

This subsection applies to questions that were only asked to veterinary health professionals. Though all respondents were initially asked what category their occupation best fits into (in order to determine the suitable occupation based section), VHPs were asked to clarify which subcategory of their occupation best fits into. The highest proportion of respondents were students (37.8%), followed by veterinarians (33.3%), veterinary technician/nurse (26.7%). Only one respondent answered veterinary assistant.

In response to the question asking if respondents were currently working in the veterinary field, the majority (57.8%) said *yes*. One person said *no*, while 40% of respondents were students. Most respondents were either small animal practitioners (57.8%) or students (33.3%). Two were farm animal veterinarians, one worked with exotics, and another worked was an equine veterinarian. When asked which country was their main country of practice, the top three countries were Hungary (24.4%), the UK (22.2%), and Norway (13.3%).

VHPs were also asked how often they worked with pit bulls. Most respondents answered that they worked with pit bulls occasionally (40%) or rarely (37.8%), while only two

respondents (4.4%) worked with pit bulls very often (daily). 8.9% worked with pit bulls often, and 8.9% never.

When asked which factor most significantly impacted their opinion on BSL, VHPs selected "personal experiences with affected dog breeds", "social media/news articles", and "veterinary related education" in relatively similar proportions (37.8%, 31.1%, and 31.1%, respectively).

5.2.2 Animal-related Work

Respondents were asked to clarify their occupation. All respondents chose the "other" option and were consequently asked to specify their occupation. Respondents answered with "Clinical animal behaviorist" (x2), "Scuba instructor/aquarium caretaker", "Scientific advisory", "Zoo animal behavior and enrichment specialist", "Dog behaviorist for animal shelter", and "Animal welfare scientist".

Similarly to VHPs, Animal related workers were asked which factors they believe has most significantly impacted their opinion on BSL, but instead of "veterinary education" as an answer choice, they were given "education/training". 85.7% respondents chose "education/training", while only one respondent chose "personal experience with affected breeds". No respondents in the animal related work category chose "social media/news articles".

5.3 Questions Specific to the General Public (Category "Other")

Respondents in the "other" category were also asked to clarify their occupation, and answered with: "accountant", "Sports business department head", "Environmental advisor", "Housewife/cleaner" (x2), "Insurance special investigations", "Journalist", "Licensing officer for animal center standards", "Management consultant", "Marketing", "Mechanic", "Nurse", "Order packer", "Policy and science officer at RSPCA", "property manager", "Registered nurse", retired (x6), student, "treasury specialist", "truck driver", and "self-employed".

Respondents were asked if they had received any formal or non-formal education on dogs, with the intent of gaging their level of experience with dogs. Most respondents (70.4%) answered *no*. 29.6% answered *yes* and were asked to clarify the type of education they had received. Responses were as follows: "I volunteer at a local shelter where they provide some training regarding handling of dogs.", "Personal research, both scientific and non-scientific.

Also, educational videos from professional dog behaviorists.", "Undergraduate degree in Bioveterinary Sciences & Masters in Applied Animal Behavior and Welfare", "Animal Management diploma, Zoology degree, Animal Behavior diploma, in house behavior training with the RSPCA including BSL, previously a dog warden", "Some non-formal education because of my own dog", "I've been training dogs for over 30 years", "Non-formal reading", and "Studied level 3 and 5 canine behavior currently studying for level 6 in applied animal behavior".

Participants were asked if they had any experience working with pit bulls, for example as a shelter volunteer. Most said *no* (81.5%). Respondents in this category were also asked which factors they believe have most significantly impacted their opinion on BSL. 51.9% of respondents answered "social media/news articles", 40.7% answered "personal experiences with affected dog breeds", and 7.4% answered "information from veterinarian or dog trainer".

The general public was also asked which factors had most significantly impacted their opinion of BSL. Just over half of the respondents (51.9%) responded "social media/news articles". 40.7% answered "personal experiences with affected dog breeds", and only 7.4% respondents answered "information from veterinarian or dog trainer".

5.4 Comparisons Between Groups

5.4.1 Current and Past Dog Ownership

Only a small proportion of VHPs (5/52 or 9.6%) reported ever having owned a pit bull, while none of the general public did the same. Within the VHP category, one technician/nurse, one assistant, and three animal-related workers owned a pit bull. Though only five VHPs reported having owned a pit bull, when asked which breeds they owned currently or had previously owned, six VHP respondents answered with breeds that are considered pit bulls. It is likely that one respondent did not consider their dog to be a pit bull.

Rates of current dog ownership were relatively high and similar across groups. VHPs and the general public showed similar rates of owning at least one dog (63.5% and 63%, respectively). Respondents who currently owned dogs listed a wide range of breeds. Rates of pit bull ownership were low across all groups, with only 5.8% of VHPs and none of the general public reporting currently owning a pit bull. VHPs reported owning mostly working,

herding, or mixed breeds. In comparison, the general public reported a more diverse range including small companion breeds. Regarding breeds owned previously, both groups reported a similarly wide range including small companion breeds, working breeds, and mixed breeds.

5.4.2 Attitudes Towards Pit Bull Type Dogs

VHPs were more willing than the general public to consider owning a pit bull type dog, with 50% of VHPs answering *yes* compared to 18.5% of the general public ($p = 0.0078$). Within the VHP category, willingness varied considerably. Students were most willing to own a pit bull, with 76.5% responding *yes*. Animal-related workers showed a similar willingness, with 71.4% responding *yes*. The one assistant indicated a willingness to own a pit bull. Technicians/nurses were less likely, with 33.3% responding *yes*. Veterinarians were the least likely to own a pit bull, with only 20% responding *yes*. Statistical analysis revealed this variation in willingness between VHP subgroups was also statistically significant ($p < 0.01$).

Participants were asked to give a short description or provide key words that represented what they most associated with the term *pit bull type dog*. The answers were then placed into five categories based on theme: positive, negative, stereotype/stigma, policy, and strength/protection. To preserve the often nuanced nature of such open-ended questions (i.e. containing multiple themes), some responses were counted in multiple categories. Therefore, percentages represent the proportion of respondents whose answer fell into the given theme category and do not represent mutually exclusive categories.

Positive associations referred to words/phrases such as “loving”, “friendly”, “family pet”, and “always happy”. Negative associations included terms such “aggressive”, “dangerous”, “behavioral problems”, “attacking”, “kill”, and “can’t be trusted”. The stereotype/stigma category included any reference to pit bull stereotypes, regardless of whether the person believed the stereotype (i.e. “owned by criminals”) or simply acknowledged the existence of stigma associated with pit bulls (i.e. “misunderstood and misjudged”). Though this category could have been split into subcategories, the decision was made to use one main category because both statement types reflect an overlap between describing stereotypes and commenting on their existence making it difficult to categorize the respondents intent. References to bans/legal restrictions were placed in the policy-themed category. Lastly, words and phrases such as “pure muscle”, “strong”, or “protector” were placed in the strength/protection category.

Table 1 shows how the different themes were distributed between the two main respondent groups. Among the VHP group, 46.2% had positive associations to pit bulls, 19.2% had negative associations, 40.4% referenced stereotypes or stigma, 9.6% mentioned policy, and 25% associated pit bulls with strength or protection. In comparison, among the general public 29.6% had positive associations, 63% had negative associations, 29.6% referenced a stigma or stereotype, only 3.7% mentioned a legislative element, and 14.8% mentioned strength or protection. Statistical analysis showed that the only theme with a significant difference between groups was negative associations ($p < 0.001$), suggesting that the general public was more likely to have negative associations to pit bulls. A few people believed that one should use caution around pit bulls, but stressed that this was due to lack of trust in the owners not the breed of dog. Some said dangerous but specified that they did not mean the SBT.

Table 1. Associations with the term "pit bull type dog" according to main group (Statistical analysis: Fisher's Exact Test)

Theme	Veterinary Health Professionals (n = 52)	General Public (n = 27)	Fisher's Exact Test (p-value)
Positive	24 (46.2%)	8 (29.6%)	0.227
Negative	10 (19.2%)	17 (63%)	*0.00016*
Stereotype/Stigma	21 (40.4%)	8 (29.6%)	0.462
Policy	5 (9.6%)	1 (3.7%)	0.658
Strength/Protection	13 (25.0%)	4 (14.8%)	0.392

Variations were also seen within VHP subgroups (**Table 2**), though none of the differences were statistically significant. Veterinarians were the most likely to have positive associations with pit bulls (53.3%), followed closely by students (47.1%) and animal related workers (42.9%). Negative associations were relatively low across subgroups, the highest being 23.5% of veterinary students. Notably, no animal-related workers used words with negative connotations to describe pit bulls. The highest proportion of stereotype/stigma associations was found in the animal-related worker subgroup (57.1%), followed by technicians/nurses (41.7%) and students (41.2%). Overall associations with policy were very low, with the highest being 16.7% of technicians/nurses. About a third of both veterinarians and veterinary students associated pit bulls with strength and protection. The single assistant used words associated with positivity and strength.

Table 2. Associations with the term "pit bull type dog" according to VHP subgroup (Statistical analysis: Fisher's Exact Test)

Theme	Vet (n = 15)	Vet technicians/ nurses (n = 12)	Vet assistants (n = 1)	Vet students (n = 17)	Animal-related worker (n = 7)
Positive	8 (53.3%)	4 (33.3%)	1 (100%)	8 (47.1%)	3 (42.9%)
Negative	3 (20%)	3 (25%)	0 (0%)	4 (23.5%)	0 (0%)
Stereotype/ stigma	5 (33.3%)	5 (41.7%)	0 (0%)	7 (41.2%)	4 (57.1%)
Policy	1 (6.7%)	2 (16.7%)	0 (0%)	1 (5.9%)	1 (14.3%)
Strength/Protection	5 (33.3%)	2 (16.7%)	1 (100%)	5 (29.4%)	0 (0%)

5.4.3 Attitudes Towards Breed-specific Legislation

Participants were also asked to give a short description or write down key words/emotions they associated with the term "breed-specific legislation". Similarly to the previous question, responses were categorized according to theme. The categories are "restriction/ban", "unfair/injustice", "ineffective/waste of time", "result of stereotypes/media influence", "public safety/dangerous dogs". The "restriction/ban" category encompassed any reference to legislation or typically legislated breeds, such as "pit bulls", "ban on pit bulls" or "banned breeds". The "unfair/injustice" category included responses expressing sadness or that BSL is discriminatory, such as "sad" or "biased rule", or referencing welfare effects (i.e. "euthanasia"). The "ineffective/waste of time" category included responses commenting on the effectiveness of BSL, such as "doesn't work" or "outdated law". The "results of stereotypes/media influence" category included references to the media or stereotypes, such as "afraid of what they don't understand" and "law that has come into place because people react badly to the news". Lastly, responses referencing BSL as necessary for public safety (ex. "safety reasons") or referring to the need to solve the dangerous dog problem (ex. "dangerous" or "many pit bulls kill"), were placed in the "public safety/dangerous dogs" category.

As with the question on pit bull associations, responses were allowed to fit into multiple categories. Participants who responded with "don't know" were removed and excluded from analysis due to the lack of interpretable association. Two responses from the general public category were consequently removed, and the total number of general public respondents adjusted to 25. One respondent within the general public group mentioned volunteering at a shelter that had stopped labeling dogs by specific breeds, choosing instead to list them as

mixed breed. A few students mentioned associating BSL more with breeding restrictions on dog breeds' whose welfare has been compromised due to their structure (i.e. brachycephalic).

Table 3 shows associations with the term "breed-specific legislation" according to theme and main respondent group. Distribution of themes was relatively similar between groups. *Restriction/ban* was the most common category for both groups, with 23 (44.2%) VHPs and 12 (48%) members of the general public choosing this theme. As such, the difference was not statistically significant (p = 0.810). A similar distribution pattern was seen in the *unfair/injustice* category, which was chosen by 19 (36.5%) of VHPs and 9 (36%) members of the general public, indicating no difference between groups (p = 1.000). Upon descriptive observation, it appeared that VHPs were more than two times as likely to consider BSL as *ineffective/waste of time*, at 11 (21.2%) compared to only 2 (8%) members of the general public. However, statistical analysis revealed that this difference did not reach statistical significance (p = 0.202). References to BSL as a *result of stereotypes/media influence* were low and did not differ much between groups, at 7 (13.5%) for VHPs and 3 (12%) for the general public. Again, this difference was not statistically significant (p = 1.000). Lastly, the *public safety/dangerous dogs* theme showed some differences and was reported by 11 (21.2%) of VHPs and 9 (36%) members of the general public. However, this difference was not statistically significant (p = 0.178).

Table 3. Associations with the term "breed-specific legislation" according to main group

Theme	Veterinary Health Professionals (n = 52)	General Public (n = 25)
Restriction/Ban	23 (44.2%)	12 (48.0%)
Unfair/Injustice	19 (36.5%)	9 (36.0%)
Ineffective/Waste of Time	11 (21.2%)	2 (8.0%)
Result of Stereotypes/Media Influence	7 (13.5%)	3 (12.0%)
Public Safety/Dangerous Dogs	11 (21.2%)	9 (36.0%)

Table 4 shows associations with the term "breed-specific legislation" according to theme and VHP subgroup. Descriptively, some differences were observed between subgroups for each theme category, but statistical analysis revealed that these differences were not significant. For the *restriction/ban* category, students showed the highest proportion of responses at 11 (64.7%) respondents, followed by animal-related workers at 3 (42.9%),

veterinarians at 6 (40.0%). Technicians/nurses reported this category in 3 (25.0%) cases, while no assistants selected this category. For the *unfair/injustice* category, technicians/nurses represented the highest proportion at 6 (50.0%), followed by animal-related workers at 4 (57.1%), veterinarians at 4 (26.7%), and students at 4 (23.5%). A similar pattern was seen for the *ineffective/waste of time* category, with animal-related workers again showing the highest proportion at 3 (42.9%), followed by veterinarians at 3 (20.0%), technicians/nurses at 3 (25.0%) and students at 1 (5.9%). The single assistant chose *unfair/injustice* and *ineffective/waste of time*. The result of stereotypes/media influence category was selected infrequently across subgroups, the highest proportion being students 3 (17.6%). Lastly, for the *public safety/dangerous dogs* category, both veterinarians and students reported 4 (26.7% and 23.5%, respectively), while technicians/nurses selected this theme at 3 (25.0%). No assistants or animal-related workers chose this category. None of the differences observed were statistically significant.

Table 4. Associations with the term "breed-specific legislation" according to VHP subgroup

Theme	Veterinarian (n = 15)	Technician/Nurse (n = 12)	Assistant (n = 1)	Student (n = 17)	Animal-related worker (n = 7)
Restriction/Ban	6 (40.0%)	3 (25.0%)	0 (0.0%)	11 (64.7%)	3 (42.9%)
Unfair/Injustice	4 (26.7%)	6 (50.0%)	1 (100.0%)	4 (23.5%)	4 (57.1%)
Ineffective/Waste of Time	3 (20.0%)	3 (25.0%)	1 (100.0%)	1 (5.9%)	3 (42.9%)
Result of Stereotypes/Media Influence	2 (13.3%)	1 (8.3%)	0 (0.0%)	3 (17.6%)	1 (14.3%)
Public Safety/Dangerous Dogs	4 (26.7%)	3 (25.0%)	0 (0.0%)	4 (23.5%)	0 (0.0%)

5.4.4 Perceived Effectiveness and Alternatives to BSL

When asked whether they believe BSL is effective in reducing the number of dog bite related injuries and deaths, VHPs and the general public responded *no* at similar rates (69.2% and 55.6%, respectively) ($p = 0.321$). Within the VHP group, all seven animal-related workers believed that BSL does not reduce the number of dog bite related injuries and deaths. The veterinary assistant, as well as most veterinarians (9/15 or 60%) and veterinary

technicians/nurses (11/12 or 91.7%), also believed BSL to be ineffective. Veterinary students were more evenly split, with 8/17 (47.1%) answering *no* and 9/17 (52.9%) answering *yes.* Though descriptive analysis showed some differences between VHP subgroups, statistical analysis revealed this difference was not significant ($p = 0.183$).

Respondents were then asked if they thought there were any alternatives to BSL that would be more effective in reducing the number of dog bites. Veterinary health professionals were most likely to respond *yes* (82.7%), though the general public was not far behind (77.8%). Statistical analysis confirmed there was no significant difference between groups ($p = 0.763$). Within the VHP group, technicians/nurses overwhelmingly responded *yes* (91.7%). The second most likely group to say *"yes"* was students (88.2%), followed by animal-related workers (85.7%). The one assistant responded *yes.* Veterinarians were the least likely of the VHP group to consider alternatives as more effective than BSL, despite over half of them (66.7%) agreeing. The one animal-related worker who answered *no* to the alternatives question also answered *no* when asked if BSL was effective. Statistical analysis showed no differences were significant ($p = 0.687$).

Respondents who answered yes were then asked to list some alternatives. One respondent answered yes to the question of alternatives but then left the specify question blank. 43 out of 52 VHPs and 20 out of 27 members of the general public suggested alternatives. Responses were classified into three categories: *owner education*, *dangerous-dog assessments (breed neutral),* and *legal interventions*. Example responses are shown in **Table 5**. The *owner education* category contained all elements relating to the human-factor, including dog training because it is the humans who must train the dogs. The *dangerous-dog assessment* category contained any reference to behavioral assessments or evaluation of individual dangerous dogs. Lastly, the *legal interventions* category contained any reference to legal mandates, whether it be mandatory assessments for owners wanting to own a dog, mandatory training classes, leash laws, harsher punishments for owners whose dogs are aggressive/have bitten. If a response contained multiple intervention types, the response was counted in both categories.

Table 5. Example responses according to intervention type

Type of Intervention	**Example Responses**
Owner Education	"reputable breeders who care for temperament testing", "education around responsible ownership", "proper training and desensitizing", "public awareness", "teaching programs for kids", "training owners to train their dog"
Dangerous-dog Assessments (breed neutral)	"behavioral assessments (…) all dogs that have shown worrying behaviors", "deed not breed", "more comprehensive bite characteristics from all types of dogs so that we know which dogs actually do bite"
Legal Interventions	"leash laws", "passing an educational class before ownership", "competency assessment", "dog licenses", "harsher punishments for those keeping aggressive/out of control dogs", "legislation over owning and rehoming dogs", "more traceability (…) microchips"", "stricter rules around breeding", "mandatory vaccination", "check the dog's vaccination and living conditions", "tax on dogs", "muzzle in high risk areas (…) for all dogs"

Results comparing suggested alternatives to BSL according to intervention type for VHPs and the general public are seen in table 6. 43 out of 52 VHP respondents and 20 out of 27 members of the general public gave suggestions. The top two categories for both VHPs and the general public were *owner education* and *legal interventions*. VHPs and the general public were equally likely to reference *owner education* based interventions, at 28 (65.1%) and 13 (65%), respectively. Statistical analysis confirms this ($p = 1.000$ for both categories). VHPs initially appeared almost 2x as likely to suggest *legal interventions* (58.1%) compared to the general public (30%), but statistical analysis determined this difference did not quite reach statistical significance ($p = 0.0577$). VHPs were also more likely (9.3%) to suggest *breed neutral assessments for dangerous dogs* compared to the general public (5%). One respondent in the VHP group reported that BSL was effective but that there was alternatives that could be more effective. This respondent specified legislation was important from some breeds as they are right now, but that with better focus on breeding for temperament this could make them "more realistic to own as the layperson". Another respondent answered no when asked if alternatives to BSL could be more effective, but then suggested "owner education" as an alternative.

Table 6. Suggestions for alternatives to BSL according to intervention type and main group

Type of Intervention	Veterinary Health Professionals (n = 43)	General Public (n = 20)
Owner Education	28 (65.1%)	13 (65%)
Dangerous-dog Assessments (Breed Neutral)	4 (9.3%)	1 (5%)
Legal Interventions	25 (58.1%)	6 (30%)

Results comparing suggested alternatives to BSL according to intervention type for VHP subgroups are shown in table 7. 11 veterinarians, 11 technicians/nurses, 1 assistant, 14 students, and 6 animal-related workers answered this question. VHPs were overall more likely to select *owner education* and *legal interventions*, the distribution of responses varied between respondent types. Animal-related workers were the most likely to select *owner education* at 100%, followed by technicians/nurses (72.7%), students (64.3%), and veterinarians (45.5%). Though differences appeared descriptively, they were determined to not be statistically significant ($p = 0.372$). Regarding *legal interventions*, the animal related workers were again the group with the highest proportion of responses (83.3%). Though they appeared more likely to suggest this category compared to veterinarians (63.6%), technicians/nurses (45.5%), and students (50%), this difference was also determined to be statistically insignificant ($p = 0.7288$). Only one person of each subgroup (with the exception of the veterinary assistant) selected *dangerous-dog assessment*. The single assistant selected *legal interventions*.

Table 7. Suggestions for alternatives to BSL according to intervention type and VHP subgroup

Type of Intervention or Regulation	Veterinarian (n = 11)	Vet Technician/Nurse (n = 11)	Vet Assistant (n = 1)	Vet Student (n = 14)	Animal-related Worker (n = 6)
Owner Education	5 (45.5%)	8 (72.7%)	0 (0%)	9 (64.3%)	6 (100%)
Dangerous-dog Assessment (Breed Neutral)	1 (9.1%)	1 (9.1%)	0 (0%)	1 (7.1%)	1 (16.7%)
Legal Interventions	7 (63.6%)	5 (45.5%)	1 (100%)	7 (50%)	5 (83.3%)

5.4.5 Perception of Factors Influencing Bite-risk

Views regarding the importance of breed in evaluating bite-risk were mixed and revealed some descriptive differences between groups. Among veterinary health professionals, 31/52 (59.6%) believed that a dog's breed is an important factor while 21/52 (40.4%) did not. Among the general public, 13/27 (48.1%) believed breed was important and 14/27 (51.9%) disagreed. The differences between groups were not statistically significant ($p = 0.351$). Within the VHP group, animal-related workers were the most likely to consider breed important (71.4%), followed by veterinarians (60.0%), technicians/nurses (66.7%), and students (52.9%). The single assistant did not believe breed was an important factor. Though there appeared to be some differences initially, this difference was again not statistically significant ($p = 0.874$).

However, when asked to compare breed to other factors such as responsible ownership, training, and socialization, the majority of respondents in both categories believed breed to be less important. In the VHP category, 30/52 (57.7%) considered breed to be less important, 18/52 (34.6%) equally important, and only 4/52 (7.7%) believed it to be more important. Within the general public category, 14/27 (51.9%) respondents believed that breed is less important, 11/27 (40.7%) equally important, and only 2/27 (7.4%) believed it to be more important. Statistical analysis revealed no statistically significant differences between groups ($p = 0.962$). Within the VHP group, animal-related workers were the most likely to consider breed as less important (71.4%), followed by students (70.6%), technicians/nurses (58.3%), and veterinarians (33.3%). The single assistant also believed breed was less important. Veterinarians were the most likely to consider breed equally important (60%), followed by technicians/nurses (33.3%), students (23.5%), and animal-related workers (14.3%). Proportions of VHPs considering breed as more important were low, with the highest proportion being animal-related workers (14.3%), then technicians/nurses (8.3%), veterinarians (6.7%), and students (5.9%). Statistical analysis revealed that no differences between subgroups were statistically significant ($p = 0.794$).

5.4.6 Welfare Impacts of BSL

Respondents were asked if they believe BSL impacts the welfare of affected breeds. 39/52 (75.0%) VHPs answered *yes*, 13/52 (25.0%) answered *no*. Proportions were relatively similar for the general public group, with 18/27 (66.7%) answering *yes* and 9/27 (33.3%) answering *no*. This lack of difference was confirmed by statistical analysis ($p = 0.441$).

Between VHP subgroups, students were the most likely to believe BSL impacts the welfare of affected breeds, with 94.1% answering *yes* (5.9% *no*). Animal-related workers were the second highest category at 85.7% *yes* (14.3% *no*), followed by technicians/nurses at 83.3% *yes* (16.7% *no*). Veterinarians were the least likely to answer *yes* (40.0%), with most (60.0%) answering *no*. The single assistant answered *yes*.

Respondents who answered yes were then asked to list some examples. One of the respondents of the general public answered yes when asked if BSL impacts the welfare of affected breeds, but did not clarify how. One respondent in the VHP category did the same. 38 out of 52 VHPs and 17 out of 27 members of the general public listed some examples. Responses were classified into six categories: *inability to express normal behaviors*, *stigma-related effects*, *shelters/euthanasia*, *improved welfare*, *abuse/neglect/lack of access to veterinary care/underground breeding*, and *human welfare/public safety*. Example responses are shown in **Table 8**. The *inability to express normal* behaviors category included affects such as limited socialization and/or exercise, forced spay/neuter impacting behaviors like anxiety, incorrectly fitted muzzles preventing the ability to pant or drink water, etc. The *shelters/euthanasia* category contained references to euthanasia, low adoption rates, owner surrender, etc. The *improved welfare* category contained any terms suggesting the welfare of affected dogs was not decreased but instead improved, such as only being owned by "responsible" individuals. The *abuse/neglect/lack of access to veterinary care/underground breeding* category contains any reference to abuse, neglect, no veterinary care, illegal breeding, dog fighting, etc. Lastly, the *human welfare/public safety* category refers to any words/phrases implying a BSL will have a negative effect on human welfare and public safety. If a response contained elements of multiple categories, the response was counted in both categories.

Table 8. Example responses of welfare effects according to effect type

Effect Category	**Example Responses**
Inability to Express Normal Behaviors	"less likely to socialize their pit bulls", "restricted lives e.g. wearing muzzles, restricted exercise", "not allowed the freedom to run", "not getting the stimulation it requires", "forced to be neutered which can impact certain behaviors such as anxiety"
Stigma-Related Effects	"less likely to own them", "animal racism", "fear of the breed", "creates mores stigma seeing a blocky headed dog in a muzzle", "no one can/wants to adopt them anymore", "if a dog moves quickly towards a person (…) more prone to hit the dog if it's a BSL breed", "people view them as inherently evil or dangerous so they mistreat/abuse them", "demand for these dogs for fighting or protection only increases after legislation"
Shelters/Euthanasia	"fewer adoptions and more euthanizing of those breeds", "suffer in kennels", "relinquishment", "euthanizing healthy animals is terrible welfare"
Improved Welfare	"breeding requirements(…)secure the health of the breed", "only responsible and breed fanatic person will own them"
Abuse/Neglect/Lack of Access to Veterinary Care/Underground Breeding	"cannot get proper vet care", "abandonment", "improper care", "illegal breeding that leads to bad living conditions or increasing black market activities such as dog fighting",
Human Welfare/Public Safety	"diverts need for education", "negatively impact owners/veterinary professional that then have to seize/destroy these dogs"

Results for perceived effects of BSL are shown in **Table 9**. Overall, VHPs and members of the general public displayed similar patterns across all effect categories, and none of the observed differences were statistically significant. The most frequently selected themes among VHPs were *inability to express normal behaviors* and *shelters/euthanasia* (both 36.8%), with nearly identical proportions reported by the general public for inability to express normal behaviors (35.3%) ($p = 1.000$). *Stigma-related effects* were more commonly reported by the general public (52.9%) than by VHPs (31.6%), although this difference did not reach statistical significance ($p = 0.148$). Themes related to improved welfare were rare in both groups ($p = 0.580$). It should be noted that three out of four of those who chose improved welfare were usually referring to breeding restrictions on breeds known for health problems ("like only breeding frenchies without breathing problems"), rather than suggesting improved welfare for stigmatized breeds. Responses involving *abuse/neglect/lack of access to veterinary care/underground breeding* or *human*

welfare/public safety were similarly comparable across groups (p = 0.536 and p = 0.527, respectively). Overall, these findings indicate that while descriptive differences exist between VHPs and the general public, none of the effect categories differed significantly between groups.

Table 9. Perceived effects of BSL of welfare of affected dogs according to main group

Effect Category	Veterinary Health Professionals (n = 38)	General Public (n = 17)
Inability to Express Normal Behaviors	14 (36.8%)	6 (35.3%)
Stigma-Related Effects	12 (31.6%)	9 (52.9%)
Shelters/Euthanasia	14 (36.8%)	4 (23.5%)
Improved welfare	2 (5.3%)	2 (11.8%)
Abuse/Neglect/Lack of Access to Veterinary Care/Underground Breeding	13 (34.2%)	4 (23.5%)
Human Welfare/Public Safety	1 (2.6%)	1 (5.9%)

Results for perceived effects of BSL among VHP subgroups are presented in **Table 10**. Overall, descriptive differences were observed across groups but none reached statistical significance. For example, *inability to express normal behaviors* was most frequently mentioned by students (40.0%) and animal-related workers (50.0%), with lower proportions among veterinarians (33.3%) and technicians/nurses (30.0%), although statistical analysis revealed no significant difference (p = 0.971). *Stigma-related effects* were reported most often by veterinary students (46.7%), yet this variation also failed to reach statistical significance (p = 0.419).

Mentions of *shelters/euthanasia* ranged from 26.7% to 50.0% across groups, but showed no statistically significant variation (p = 0.804). *Improved welfare* was rarely cited (only veterinarians mentioned this effect) and the subgroup differences were not significant (p = 0.259). Reports of *abuse/neglect/lack of access to veterinary care/underground breeding* varied descriptively, with technicians/nurses and students selecting this category most frequently, but again did not differ significantly between subgroups (p = 0.363). Finally, references to *human welfare/public safety* were extremely uncommon overall and showed no meaningful subgroup differences (p = 0.780). Collectively, these findings indicate that while some subgroup variation existed descriptively, none of the effect categories differed significantly between VHP subgroups.

Table 10. Perceived effects of BSL of welfare of affected dogs according to VHP subgroup

Effect Category	Veterinarians (n = 6)	Vet Technicians/Nurses (n = 10)	Vet Assistants (n = 1)	Vet Students (n = 15)	Animal-Related Workers (n = 6)
Inability to Express Normal Behaviors	2 (33.3%)	3 (30.03%)	0 (0.0%)	6 (40.0%)	3 (50.0%)
Stigma-Related Effects	1 (16.7%)	1 (10.0%)	1 (100.0%)	7 (46.7%)	2 (33.3%)
Shelters/Euthanasia	2 (33.3%)	4 (40.0%)	1 (100.0%)	4 (26.7%)	3 (50.0%)
Improved welfare	2 (33.3%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Abuse/Neglect/Lack of Access to Veterinary Care/Underground Breeding	0 (0.0%)	5 (50.0%)	1 (100.0%)	6 /40.0%)	1 (16.7%)
Human Welfare/Public Safety	0 (0.0%)	1 (10.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)

5.4.7 Influencing Factors for BSL Implementation

Respondents were asked which factors they believed were most influential in the passing of BSL. VHPs most commonly selected public perception/demand (44.2%), followed by media coverage (23.1%) and political pressure (19.2%). Only 13.5% believed dog bite statistics were the most influential factor. The general public showed a slightly different distribution, with the top factors being dog bite statistics (29.6%) and public perception/demand (29.6%). Next was media coverage (25.9%) and political pressure (14.8%). Despite descriptive differences, statistical analysis revealed no statistically significant differences ($p = 0.747$).

Within the VHP group, some differences were seen. Veterinarians most commonly selected media coverage (40.0%), followed by public perception/demand (26.7%), dog bite statistics (20.0%), and political pressure (13.3%). The top factor for technicians/nurses was public perception/demand (50.0%), political pressure (25.0%), media coverage (26.7%), and dog bite statistics (8.3%). The single assistant selected political pressure. Students most commonly selected public perception/demand (58.8%), media coverage (17.6%), dog bite statistics (11.8%), and political pressure (5.9%). Lastly, animal-related workers most commonly suggested public perception/demand (42.9%) and political pressure (42.9%)

14.3% chose media coverage, and none chose dog bite statistics. Though some differences were seen descriptively, these differences were not statistically significant (p = 0.759).

5.4.8 Media Reliability

Respondents were asked if they believe media or news articles were a reliable source of information when determining the breed of dog involved in an attack. The majority of both groups responded no: 45/52 (80.8%) of VHPs and 20/27 (74.1%) members of the general public. Therefore, no statistically significant difference was found (p = 0.568). A similar trend was seen between VHP subgroups, though the proportions varied. 66.7% of veterinarians responded no, along with 91.7% of technicians/nurses, 82.4% of students, and 85.7% of animal-related workers. The single assistant responded no. Though descriptive analysis revealed some differences, these differences were not statistically significant (p = 0.758).

5.4.9 Fear or Avoidance of Specific Dog Breeds

Participants were asked if there are any dog breeds they are afraid of or would keep their distance from. Among VHPs, 18/52 (34.6%) reported that there were dog breeds they were afraid of or would keep their distance from. 34/52 (65.4%) stated they were not afraid of any breed. In comparison, the general public showed a slightly higher level of concern, with 14/27 (51.9%) reporting being afraid of some breeds. This difference was not statistically significant (p = 0.155). Among the VHPs, veterinarians and technicians/nurses showed identical levels of fear, with 10/15 (66.7%) and 8/12 (66.7%) respectively, stating that there were dog breeds they were afraid of or would keep their distance from. The single assistant did not report being afraid of any breeds, and only 1/7 (14.3%) of animal-related workers reported being so.

5.4.10 Overall Support or Opposition to BSL

Lastly, respondents were asked whether they support or oppose BSL. Overall support or opposition to BSL was comparatively similar between VHPs and the general public (**Figure 4**). Among VHPs, 3/52 (5.8%) strongly supported BSL and 9/52 (17.3%) somewhat supported it. 11/52 (21.2%) were neutral. Opposition was the most common position among VHPs: 14/52 (26.9%) somewhat opposed BSL and 15/52 (28.8%) strongly opposed it. The general public showed a relatively similar distribution. 3/27 (11.1%) strongly supported BSL, 7/27 (25.9%) somewhat supported it, and 5/27 (18.5%) were neutral. 7/27 (25.9%)

somewhat opposed it, and 5/27 (18.5%) strongly opposed it. Statistical analysis revealed no significant difference in support between groups (p = 0.951).

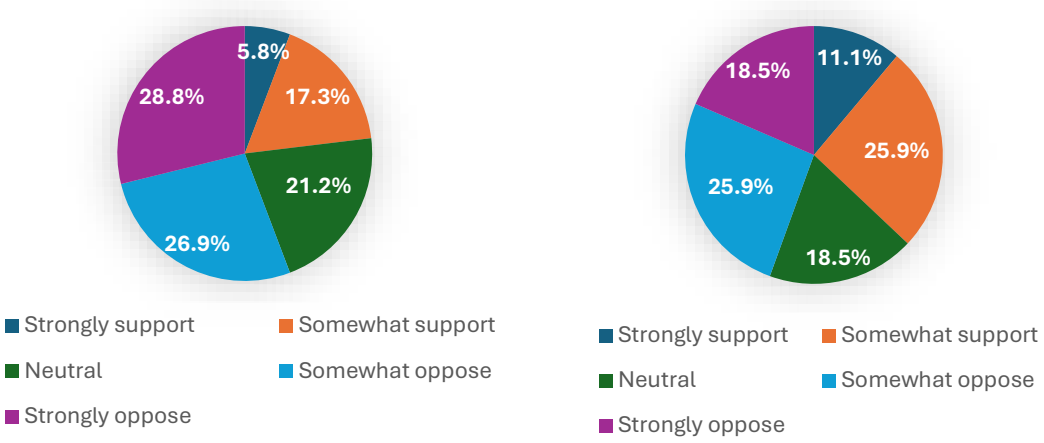


Figure 4. Left: Distribution of level of support for breed-specific legislation among veterinary health professionals. Right: Distribution of level of support for BSL among the general public

Overall support for and against BSL appeared to vary between subgroups, however no statistically significant differences were seen (p = 0.753). **Figure 5** shows the distribution of support/opposition to BSL among VHP subgroups. Among veterinarians, responses were distributed across all five categories, with the largest proportion being somewhat opposed to BSL (33.3%). Technicians/nurses showed a similar distribution, though a larger portion were strongly opposes (41.7%). The top two categories for students were "somewhat opposed" (35.3%) and "neutral" (29.4%). Animal-related workers were the most strongly opposed to BSL (57.1%). The single assistant also selected "strongly opposed".

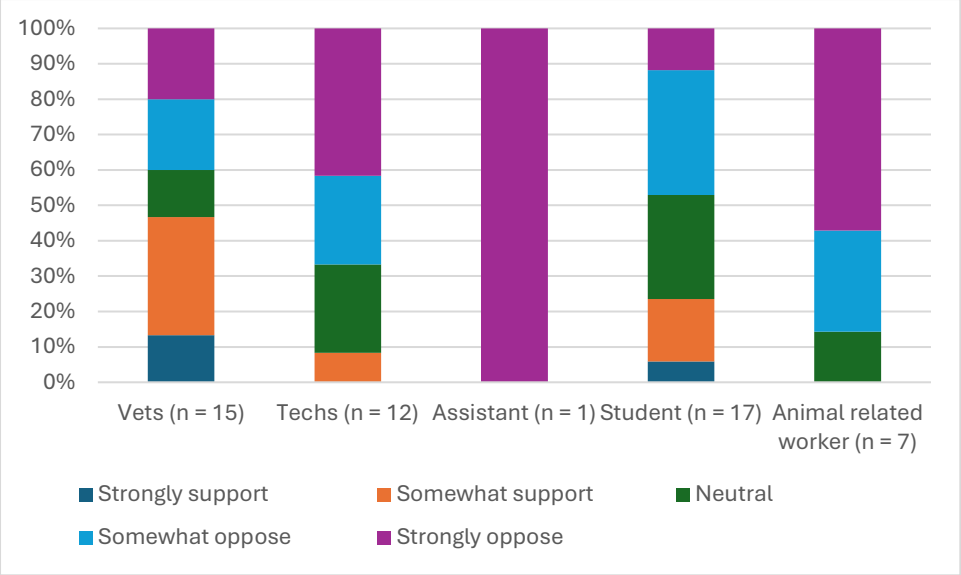


Figure 5. Distribution of support/opposition to BSL among VHP subgroups

6. Discussion

6.1 Evaluation of Results

The results of this study reveal several patterns that align with trends previously described in the literature. Many of the results are also best analyzed through the demographic characteristics of the survey respondents. The overwhelming majority of respondents were female (87.3%). This trend was seen across both main groups, with 90.4% of VHPs and 81.5% of the general public being female. These finding aligns with those seen in literature regarding companion animals, animal welfare, and veterinary medicine in that women tend to be more represented and are often more likely to participate in surveys of animal-related topics [70]. A related demographic feature was the younger age distribution of the VHP group and the relatively low number of participants without children. More than half of VHPs (55.8%) were aged 18-29. This is likely a result of how the survey was distributed. Veterinary associations did not respond to email requests and only one rescue organization agreed to share the survey, resulting in many respondents being reached through university contacts. This has likely shifted the distribution of respondents towards students and new graduates, which tend to be in the younger age range and hence less likely to have children.

Patterns relating to pit bull ownership also reflected broader external factors. Few respondents overall reported owning a pit bull type dog, with only 5/52 VHPs (9.6%) and none of the general public reporting ever having owned one. This could be a reflection of the geographic distribution of respondents. While participants were from a wide range of countries, the top countries were the UK (25.3%), Norway (19.0%), and the USA (16.5%). The UK and Norway have nationwide bans on pit bulls [7], and around 36 US states have some form of breed-specific legislation [6]. Since a large portion of participants were from countries with restrictions or bans on pit bulls, it is not surprising that overall ownership of pit bulls was low. Issues surrounding stigma and adoptability could also have contributed to this rate. One general public reported having volunteered at a US shelter that had stopped using breed labels instead referring to dogs as mixed breed. This reflects research indicating that removing breed labels from kennel cards can improve adoption outcomes for pit bull type dogs [66].

Willingness to own a pit bull varied significantly across groups, with 50.0% of VHPs and 18.5% of the general public indicating a willingness. This difference was statistically significant ($P < 0.001$). While this finding suggests that the education and clinical experience

VHPs receive could have contributed to their increased willingness to own a pit bull, direct causation cannot be determined by the present study. Another interesting finding is that despite the overall higher willingness among VHP, findings varied quite significantly between subgroups. Students and animal-related workers were relatively equally willing to own a pit bull, at rates of 76.5% and 71.4%, respectively. In contrast, only 33% of technicians/nurses and 20% of veterinarians showed willingness. This difference was also statistically significant ($p < 0.05$). Though no current research could explain these findings directly, there are some contextual factors that could be relevant. For example, veterinarians and technicians receive plenty of exposure to dogs through their jobs. However, this frequently occurs in contexts where the animal is scared or in pain, and hence more likely to show aggressive or defensive behaviors.

Open-ended questions allow for additional insight into the more nuanced nature of many opinions and perceptions relating to pit bulls and BSL. VHPs frequently referred to issues such as misidentification, stereotypes, and irresponsible ownership. These issues are often highlighted in literature discussing breed misidentification and the problems that can arise from attributing dangerous behavior to breed alone [11, 59]. Members of the general public were more likely to have fear-related or negative associations with pit bull type dogs. This finding aligns with existing literature that suggests a connection between media coverage of dog bite incidents and public perception of risk associated pit bulls [23]. Although these patterns did not reach statistical relevance in the present study, descriptive analysis remained consistent with existing research.

Regarding opinions of the effectiveness of BSL, neither group expressed strong confidence in such laws. A majority of VHPs (69.2%) and over half of the general public (55.6%) believed BSL is not effective. Respondents were even more likely to state that alternatives to BSL would be more effective, at rates of 82.7% and 77.8% for VHPs and the general public, respectively. These findings align with statements made by veterinary and animal-rescue/welfare organizations that emphasize behavior-based assessments, owner responsibility, and education programs over restrictions based on breed [2, 19, 69].

Alternatives suggested by respondents were also consistent with suggestions made by such groups. Owner education was the most common suggestion in both groups (65.1% of VHPs and 65.0% of the general public). However, VHPs were more likely than the general public (58.1% vs 30.0%, respectively) to suggest interventions such as licensing, compulsory training, and leash law enforcement. This difference may be explained by existing literature

that found that veterinary professionals often emphasized structured or preventative management strategies as part of public safety efforts [70].

Concerns regarding welfare impacts were also common. 75.0% of VHPs and 66.7% of the general public believed that BSL negatively impacts the welfare of dogs affected by legislation. Respondents referenced issues such as lack of exercise, limited socialization, extended shelter stays, reduced adoptability, stigma, and owner reluctance to seek veterinary care. Such concerns are well documented in existing literature on the stress and behavioral effects of long term confinement [18]. One animal-related worker emphasized the suffering of seized dogs awaiting behavioral assessment, a concern also seen in studies of animal welfare. Such studies often describe anxiety, fearfulness, and development of behavioral issues in shelter environments [65].

A majority of respondents believed that media reports were not reliable sources of breed information (80.8% of VHPs and 74.1% of the general public). This reflects evidence in current research that shows high rates of breed misidentification in media coverage and professional assessments [11, 12].

Overall support for or opposition to BSL differed between groups but follow the same trend towards limited support for such measures. Opposition was the most common position among VHPs: 14/52 (26.9%) somewhat opposed BSL and 15/52 (28.8%) strongly opposed it. The general public showed similar distributions. For veterinary health professionals, these findings matched those of veterinary organizations [2, 9, 19]. However, results in the present survey for the general public were more evenly distributed than in existing literature. Kogan et al. (2022) found that 71% of participants were opposed to breed bans [75], while this survey found that only 44.4% of the general public was either strongly or somewhat opposed to BSL. Overall, descriptive trends aligned with published findings despite only two comparisons reaching statistical significance: willingness to own a pit bull between groups and within VHP subgroups.

6.2 Study Limitations

This study has several limitations that should be considered when interpreting the findings. The most significant is the small sample size (n = 79). Small numbers within several categories (especially VHP subgroups) meant that most comparisons were not statistically significant. Due to this small sample size Fisher's exact test was used, however this could have limited the likelihood of identifying statistically significant differences.

Distribution challenges also impacted the sample composition. As mentioned previously, veterinary associations did not respond to requests and only one rescue organization agreed to distribute the survey. It is unknown why this occurred, but one potential factor could have been the high workload of such organizations. As a result, many VHP participants were reached through university networks, leading to a higher proportions of students. This likely influenced results related to age, parental status, and possibly willingness to own a pit bull. General public participation also remained lower than expected despite posting in a variety of online groups, which could have limited demographic diversity in this category.

The international sample was beneficial to obtain opinions from participants worldwide but introduces complexities that may not have been fully explored in this study. Factors such as level of exposure to breed-specific laws, cultural norms, and local dog ownership practices could have influenced the results.

6.3 Recommended Further Research

Future research should focus on increasing sample size and improving representation both within VHP subgroups and the general public. Collaboration with veterinary associations, rescue organizations, and various shelters could improve distribution and aid in obtaining more representative samples. Survey design could be improved by incorporating more follow-up questions asking respondents to clarify their reasoning. For example, asking respondents why they would or wouldn't be willing to own a pit bull could help clarify and reduce speculation when interpreting results.

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Thesis progress report for veterinary students

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Thesis title: The opinion of Veterinary Health Professional and General Public on Breed-Specific Legislation Regarding Dogs

Consultation – 1st semester

	Timing			Topic / Remarks of the supervisor	Signature of the supervisor
	year	month	day		
1.	2025	03	12	Topic	dr KG
2.	2025	03	26	First Draft	dr KG
3.	2025	04	16	Progress	dr KG
4.	2025	05	13	Progress	dr KG
5.	2025	06	18	Summer Duties	dr KG

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Consultation – 2nd semester

	Timing			Topic / Remarks of the supervisor	Signature of the supervisor
	year	month	day		
1.	2025	8	12	State after Summer	dr KG
2.	2025	10	15	Progress	dr KG
3.	2025	10	29	Draft	dr KG
4.	2025	11	21	Draft final	dr KG

5.	2025	11	27	Final version	dUB

Grade achieved at the end of the second semester: 5

The thesis meets the requirements of the Study and Examination Rules of the University and the Guide to Thesis Writing.

I accept the thesis and found suitable to defence,

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Date of handing the thesis in 03/12/25

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