Socioeconomic Influences on Reports of Canine Welfare Concerns to the Royal Society for the Prevention of Cruelty to Animals (RSPCA) in Queensland, Australia

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Simple Summary: The role of the socioeconomic status of dog owners in canine welfare concerns is not fully understood. We conducted a retrospective study of 107,597 canine welfare complaints attended by the Royal Society for the Prevention of Cruelty to Animals (RSPCA) Queensland from 2008 to 2018. We explored the relationship between the owner’s socioeconomic status and reported (rather than confirmed) complaints about welfare of dogs. The socioeconomic status of the owner was estimated from the postcode of where the alleged welfare issue occurred, using government statistics for Socio-Economic Indexes of different regions of Australia. Reported complaints were correlated with socioeconomic scores. There was a lower median socioeconomic score in our study group compared to the entire Queensland state, indicating that alleged canine welfare concerns were more likely to be reported in areas with inhabitants of low socioeconomic status. The status was also low if the complaint was about a crossbred rather than a purebred dog. Among the purebred dogs, complaints involving working dogs, terriers, and utility breeds were associated with the lowest socioeconomic scores. The following complaints were associated with low socioeconomic status: cruelty, insufficient food and/or water, a dog not being exercised, a dog being confined/tethered, failure to provide shelter or treatment, overcrowding, a dog being in poor condition or living in poor conditions. Increased status was observed in alleged cases of a dog being left in a hot car unattended.

Abstract: Human–dog relationships are an important contributor to the welfare of dogs, but little is known about the importance of socioeconomic status of the dogs’ owners. We conducted a retrospective study of canine welfare complaints, using Australian government statistics on the socioeconomic status of the inhabitants at the location of the alleged welfare issue. The socioeconomic score of inhabitants at the relevant postcode was assumed to be that of the plaintiff. Our dataset included 107,597 complaints that had been received by RSPCA Queensland between July 2008 and June 2018, each with the following information: the number of dogs involved, dog(s) age, breed(s), suburb, postcode, date received, and complaint code(s) (describing the type of complaint). The median index score for relative social advantage of the locations where the alleged welfare concern occurred was less than the median score for the population of Queensland, suggesting that welfare concerns in dogs were more commonly reported in areas with inhabitants of low socioeconomic status. It was also less if the dog being reported was not of a recognised breed, compared to dogs of recognised breeds. Dogs reported to be in the gundog breed group were in the most socioeconomically advantaged postcodes, followed by toy, hound, non-sporting, working dog, terrier, and utility breed groups. Reports of alleged cruelty, insufficient food and/or water, a dog being not exercised or being confined/tethered, failure to provide shelter or treatment, overcrowding,
a dog being in poor condition or living in poor conditions were most likely to be made in relation to
dogs in low socioeconomic postcodes. Reports of dogs being left in a hot vehicle unattended were
more likely to be made in relation to dogs in high socioeconomic postcodes. It is concluded that both
canine welfare complaints and dogs in specific breed groups appear to be related to the owner’s
socioeconomic status. This study may be used to improve public awareness and to tailor educational
campaigns toward different populations.

**Keywords:** dog; animal welfare; animal cruelty; RSPCA; shelter; socioeconomic

1. Introduction

Dogs (*Canis familiaris*) share intimate relationships with humans as they are one of the most popular
pets in our society [1]. According to the 2016 statistics, 3,555,000 Australian households (38.5%) own at
least one dog, accounting for 4,759,700 dogs in Australia [1]. In the household, owners may develop a
strong attachment to their dogs and vice versa, which creates a mutually beneficial relationship [2,3].
For instance, dog ownership apparently reduces owners’ physiological and psychological stresses [3,4],
as well as providing a safe haven for their dogs [5]. However, the human–dog relationship does not
always provide mutual benefits and sometimes may even break down [6].

Animal cruelty refers to any morally or legally unacceptable behaviour which causes animals to
experience physiological, psychological, and/or behavioural discomfort [7,8]. Animal welfare concerns
are reported in different forms and in different species, and dogs are one of the most commonly
reported victims [9]. Concerns may involve violence [10,11], injuries caused by their involvement
in the sporting industry [12,13], abandonment [14,15], inappropriate surgical procedures [16],
and neglecting care of the dog [9,17]. Not only do these issues compromise the welfare of dogs, some of
these welfare concerns (e.g., intentional abuse and dog fighting) have been recognised as sentinels of
other social issues [6,9], in particular domestic violence [18–20] and sexual assaults [21]. Some have
also been reported to be a precursor of antisocial behaviours among young people [7,22,23].

To address these cruelty issues, animal protection legislation has been enacted worldwide [8,9,24].
In Queensland, Australia, animals are protected by *Animal Care and Protection Act 2001* (ACPA) [8].
This state-based legislation empowers the State to appoint inspectors, some of whom are employed by
the Royal Society for the Prevention of Cruelty to Animals, Queensland (RSPCA Qld), who investigate
potential breaches of the Act and enforce compliance with the Act [8]. There are two main offences
under the ACPA: failure to fulfil ‘duty of care’ responsibilities and cruelty. There are a number of
other specified offences. The Act recognises that a person who has charge of an animal owes that
animal a duty of care. Failure to provide such care is the basis of the “breach of duty of care” offence.
This offence covers such actions as not providing sufficient food, water, exercise, veterinary care, and
suitable living conditions. It is not only the owner that has a duty of care towards an animal; anyone
who is even temporarily in charge of an animal has this responsibility. The second major offence is
“animal cruelty” and according to Section 18 of the ACPA cruelty describes any action that causes
unjustifiable and unnecessary physical and mental discomfort to animals, inappropriate confinement
or transport, unreasonable injuries and inhumane death [8]. A cruel act can be committed by anyone
towards an animal, whether it is their own animal, another domestic animal or even a wild animal [8].
It is important to note, that under the ACPA, it is not necessary for a person to have the intention of
being cruel for the offence to be proven in Queensland. If an action carried out by a person causes pain
and suffering and the action was intentional, the person may be charged with cruelty. The intention
to carry out the action must be proved but not the intention to be cruel. If a lack of action deprives
an animal of its fundamental needs, then the person who has a duty of care towards the animal may
be charged with a breach of their duty of care or cruelty depending on the circumstances. Intention
may be considered during sentencing however [8]. Other offences under the Act include unreasonable
abandonment or release, the carrying out of prohibited surgical procedures (e.g., tail docking, ear cropping, debarking, etc.); being involved in, or having items used for, a prohibited event, such as dog or cock fighting; and allowing an animal to injure or kill another animal [8].

Potential cases are reported to RSPCA Qld through various means. RSPCA Qld has a “Cruelty Complaints” telephone number manned 24 h a day, seven days a week and complaints also come in through emails. These complaints are primarily made by members of the public but a few are also made by veterinarians and veterinary nurses, council officers, and other government and non-government employees visiting a location as part of their duties. Animals surrendered to the RSPCA or that come in as strays may be investigated by RSPCA Qld inspectors if cruelty or neglect is suspected. All cases reported by sources mentioned above were the focus of this study.

Apart from aiding law enforcement, identification of risk factors associated with animal welfare concerns would be beneficial in the development of awareness and in education of the general public. Risk factors include dogs’ breed or breed group [12,15,25–27], dogs’ ages [15,28], behaviours [15,26], owners’ characteristics [15], and the complainant’s socioeconomic status [6,20,22,29]. Among all these risk factors, the role of household socioeconomic level in crimes and animal welfare concerns is not yet well understood [6,20,22]. It has been proposed that socioeconomic status is negatively correlated with the frequency of crimes, domestic violence, and neglecting and abusing animals [6,22,29–31]. However, a tautologous relationship has also been postulated, because a dog owner’s socioeconomic status may affect his or her ability to provide for all aspects of good welfare.

Therefore, this study aimed to investigate the relationships between socioeconomic status, dog breeds, and different types of dog welfare complaints. The socioeconomic status was quantified using a socioeconomic score derived from the postcode of where the alleged welfare issue occurred and government statistics for Socio-Economic Indexes of different postcode regions of Australia. We hypothesized that owners from relatively poor socioeconomic postcode regions would be more likely to be the subject of complaints about an absence of key resources for dogs, such as insufficient food, water, living space or veterinary care, lack of shelter, and poor living conditions. We also hypothesized that complaints concerning owners from poor socioeconomic regions would relate more to dog fighting, because of a known potential association with low socioeconomic status [32]. Finally, some research suggests that low socioeconomic status people are less likely to travel with their dogs, and therefore it is possible that low socioeconomic status is less likely to relate to dogs being left in a hot vehicle [33]. This is the third report in a series relating to the analysis of RSPCA Qld canine welfare complaint data [see also 27,28].

2. Materials and Methods

From July 2008 to June 2018, RSPCA Qld received 129,036 canine welfare complaints. Some involving more than one dog were recorded as multiple complaints sharing the same case number, while others were recorded as one complaint with multiple animals. To avoid sample bias due to multiple entries, we only retained the first complaint of case numbers with multiple entries, discarding 21,439 entries as a result. There remained 107,597 canine welfare complaints for this retrospective study. The data analysis was originally undertaken on the entire dataset and then repeated with the reduced number. Finding the complaint distribution and demographics to be similar, we opted for the reduced dataset to avoid pseudoreplication. Animal welfare complaints that fell within the geographical zone of responsibility of RSPCA Qld (determined by a Memorandum of Understanding between RSPCA Qld and Biosecurity Queensland, the Government Department tasked with the administration of ACPA) were investigated by RSPCA Qld inspectors. All other complaints were referred by RSPCA Qld to Biosecurity Queensland to be investigated by their inspectors. All complaints received by RSPCA Qld were included in this study, regardless of which authority investigated them.

All complaints were recorded in ShelterBuddy® (RSPCA, Queensland, Australia), the RSPCA Qld database. The following information was requested from the reporter of each incident at the time of taking the complaint: the number of dogs involved and their age, breed(s) (if known), the
“complaint code(s)”, suburb, postcode and date. All cases were investigated either by RSPCA Qld inspectors (n = 100,432) or Biosecurity Qld inspectors (n = 7165). It is recognized that some of the calls, once investigated, were found not to relate to a breach of the ACPA or to a genuine welfare concern. However, the outcome data for complaints were not analysed in this research, which focused solely on the complaint calls received by RSPCA Qld.

Dogs were classified according to two broad age ranges, dog and puppy, based on reporters’ interpretation. It was important to recognise that the information recorded from the complainant may be inaccurate or inaccurately interpreted, e.g., a small dog is commonly referred to as a puppy in Queensland. Records regarding breed and the number of dogs involved were based on either complainants’ initial reports or comments from trained inspectors, again recognising inaccuracies with identification of the breed. The “complaint code” was selected by the staff member receiving the call or email from a drop-down menu of 18 possible complaints (Appendix A) [28]. Multiple “complaint codes” were able to be selected for each case according to the description of what was alleged to have happened to the dog(s), and each was treated as a separate code for analysis.

2.1. Socioeconomic Scores

Australia is spatially divided into regions by postcodes; our dataset included the postcode of the location of the dog being reported, which was taken as a proxy measure for the socioeconomic status of the owner. We also reviewed the Australian government’s Socio-Economic Indexes for Areas (SEIFA) developed in 2011 [34], which rank postcode regions in Australia by the socioeconomic level of inhabitants. Four indices are assigned to each area to describe the local socioeconomic status: (1) the Index of Relative Socio-Economic Disadvantage, (2) the Index of Relative Socio-Economic Advantage and Disadvantage, (3) the Index of Economic Resources, and (4) the Index of Education and Occupation. Each index is ranked by decile, percentile, and score. Among these four indices, the Index of Relative Socio-Economic Advantage and Disadvantage (IRSAD) correlates well with the other three and is suitable for comparing the entire range of areas, and was therefore considered the most appropriate descriptor of the socioeconomic level of inhabitants of each postcode [34]. The IRSAD score is a weighted combination of selected indicators of advantage and disadvantage: household income, availability of internet connection, educational level, occupation, employment rate, property, mortgage, and health. Nationwide, the score is standardized with a mean of 1000 and a standard deviation of 100, with a mean, median and standard deviation in Queensland of 999, 1014 and 65 respectively. An area receives a score of 1000 if all of the above indicators are equal to the national average; the score for an area increases or decreases if the indicators are greater or less than the national average, respectively [34]. The index is positively associated with socio-economic advantage and negatively associated with socio-economic disadvantage, thus a region with a high IRSAD score is more likely to have people with high socioeconomic levels dwelling within it [34].

2.2. Dog Breeds

Any breed in our dataset that was recognized by the Australian National Kennel Council (ANKC) [35], New Zealand Kennel Club (NZKC) [36], American Kennel Club (AMKC) [37], or United Kennel Club (UKC) [38] was considered a recognized breed (RB) (see Appendix B list of recognized breeds). Any other reported breed in our data was considered an unrecognised breed (UB), including all crossbred dogs without any identified breed. If more than one dominant breed was listed, the first mentioned was used. For instance, Great Dane × Bull Arab was categorized as Great Dane (Appendix B).

To achieve a secondary representation of breed recognition, RB breeds were amalgamated into the following seven breed groups based on the breed inclusion categories of the ANKC: toys, terriers, gundogs, hounds, working dogs, utility, and non-sporting. Breeds not listed by the ANKC but recognised by the NZKC, AMKC, or UKC were categorized into one of the seven groups based on the description of each kennel club. Some breeds (e.g., Australian Koolie and Bull Arab) were listed
by the council registration, it being an obligation of all dog owners in Queensland to register their dogs with the local council. As a result, they were on the breed list (Appendix B), however they were not recognised as breeds by any major kennel club worldwide. Therefore, these breeds were categorized as unrecognized breeds, UB. If the breed description was left blank, the dogs’ breed was considered unknown (n = 15,576/107,597), and these complaints were excluded from any data analysis related to breed factors. Our previous study suggested that, compared to specific breeds, breed groups and the dichotomization into RB and UB provided better agreements between the public and the trained RSPCA inspectors, and were therefore used for genotype identification in a public reporting system [27]. Therefore, this study used breed groups and RB/UB dichotomization rather than specific breeds for statistical analyses.

2.3. Statistical Analysis

Data was analysed using the statistical package Minitab® 17.3.1. (Minitab, LLC., State College, PA, USA). The distributions of IRSAD scores of both our entire study group and the RB/UB differentiation were not normal. Box–Cox and John transformations were used, but the assumption of normal distribution of residuals still could not be met. Therefore, a one-sample sign test was used to compare the median IRSAD scores between owners of dogs involved in an alleged incident in our dataset and the entire Queensland population as recorded by SEIFA. A Mann–Whitney test was conducted to compare the IRSAD scores of postcodes where there had been reports of RB and those of UB. As for the IRSAD scores of owners of dogs of the different breed groups, normality was assessed by visual inspection of residual plots. All complaints were independent but the assumption of equal variance could not be met based on the Bartlett’s test (p = 0.018). Consequently, Welch’s ANOVA followed by the Games-Howell pairwise comparisons were used to compare IRSAD scores between dogs of the different breed groups.

To determine factors influencing complaint codes, the IRSAD score, dog’s age (dog or puppy), and breeds (UB or RB) were entered into eleven binary logistic regression models as fixed factors, using non-linear logit models with an alpha value for variables to enter the model of 0.15 [39]. Complaint codes were entered into the model as outcomes. Each case was independent from each other, and little multicollinearity was observed for all independent variables, with the variance inflation factors being less than 5. The linearity of the independent variable (the IRSAD score for the postcode of the dog) and the log-odds was assessed by plotting the independent variable and the log-odds fitted with a linear regression line. The assumption of linearity was considered met when the P value of a straight-line regression was less than 0.05. Eight complaint codes—Abandonment, Baiting/poisoning, Causing a captive animal to be injured/killed by dog, Dog fighting or other prohibited offence, Emergency relief, Keeping or using an animal for blood/blooding/coursing a dog, Prohibition order breached, and Tail docking or other surgical procedure—did not fulfill the linearity assumption. Therefore, to fulfill the linearity assumption, Causing a captive animal to be injured/killed by dog, Dog fighting or other prohibited offence, Keeping or using an animal for blood/blooding/coursing a dog, and Knowingly allowing an animal to kill/injure another were combined and categorized as a new code—Dog fighting. Baiting/poisoning, Cruelty, Prohibition order breached, and Tail docking or other surgical procedure were combined and categorized as a new code—Cruel act. Abandonment did not meet the linearity assumption statistically, but the graph was linear by observation, so the code was still used to construct a stepwise forward binary logistic model. Finally, the IRSAD score was removed from the regression model of Emergency relief because it did not meet the linearity assumption and the code was rarely cited in the past decade (0.01%, n = 8) [28]. Eleven stepwise forward binary logistic regression models were constructed to examine how different fixed factors (IRSAD score, dog’s age and breeds) correlated with different outcomes (9 complaint codes and 2 combined complaint codes). Separate models were constructed for each code with the same input variable. In this paper, we focused on the relationship of IRSAD scores with complaint codes and breed factors. The relationship of other variables with the complaint codes have been reported separately [27,28].
3. Results

3.1. Descriptive Statistics

The median IRSAD score of owners being reported (median = 975) was significantly lower ($p < 0.001$) than that recorded for the population of Queensland (median = 1,014), and the Q1 and Q3 values were less (Table 1). Owners of reported UB dogs had significantly lower IRSAD scores (median = 970) than those reported owning RB dogs (median = 981) ($p <0.001$) (Table 2). Mean IRSAD scores for the postcodes of the different breed groups reported were significantly different ($p <0.001$) (Table 3), with gundogs (994 ± 63.0) being the highest, followed by toy (986 ± 64.3) and hound (984 ± 63.7), then non-sporting (980 ± 64.6) and working dogs (977 ± 63.0), terriers (977 ± 62.7) and utility dogs (976 ± 62.2).

Table 1. Descriptive analysis of Index of Relative Socio-Economic Advantage and Disadvantage (IRSAD) scores of the postcode of dogs in our study and those determined for the population of Queensland.

| Study Group | Queensland | $p$ Value (One-Sample Sign Test) |
|-------------|------------|---------------------------------|
| Median      | 975        | 1014                            |
| Q1          | 935        | 967                             |
| Q3          | 1021       | 1039                            |

Q1: the first quartile; Q3: the third quartile.

Table 2. Index of Relative Socio-Economic Advantage and Disadvantage (IRSAD) scores of the postcode of owners of dogs reported to be recognised breeds (RB) and unrecognised breeds (UB).

| UB (n = 35,080) | RB (n = 56,663) | $p$ Value (Mann-Whitney Test) |
|-----------------|-----------------|--------------------------------|
| Median          | 970             | 981                            |
| Q1              | 934             | 935                            |
| Q3              | 1014            | 1024                           |

Q1: the first quartile; Q3: the third quartile.

Table 3. Total numbers and Index of Relative Socio-Economic Advantage and Disadvantage (IRSAD) scores of the postcode of reported dogs in each breed group ($p < 0.001$).

| Breed Group     | N     | Mean ± (SD) | Grouping * |
|-----------------|-------|-------------|------------|
| Gundogs         | 4394  | 994 ± (63.0)| A          |
| Toys            | 5203  | 986 ± (64.3)| B          |
| Hounds          | 3152  | 984 ± (63.7)| B          |
| Non Sporting    | 5056  | 980 ± (64.6)| C          |
| Working Dogs    | 14,049| 977 ± (63.0)| D          |
| Terrier         | 15,979| 977 ± (62.7)| E          |
| Utility         | 8830  | 976 ± (62.2)| E          |

* Means not sharing a letter are significantly different ($p < 0.05$) by Games-Howell pairwise comparisons. SD: standard deviation.

3.2. Complaint Codes

The IRSAD scores of postcodes of dogs who were or were not reported for each complaint code significantly differed for the nine regression models (Table 4). The odds ratio (OR) was defined as a one unit increase in the IRSAD score leading to a corresponding x-fold decrease or increase in the odds of the cited event. The following codes were associated with dogs from postcodes with low IRSAD scores: cruel act (OR = 0.9994, $p < 0.001$), insufficient food and/or water (OR = 0.9981 $p < 0.001$), no exercise/confined/tethered (OR = 0.9979, $p < 0.001$), no shelter (OR = 0.9990, $p <0.001$), no treatment (OR = 0.9986, $p <0.001$), overcrowding (OR = 0.9982, $p = 0.002$), poor dog condition (OR = 0.9974, $p <0.001$) and poor living conditions (OR = 0.9996, $p = 0.002$). A single code was associated with dogs in postcodes with a high IRSAD score, hot animal in a car (OR = 1.0067, $p < 0.001$).
Table 4. Median Index of Relative Socio-Economic Advantage and Disadvantage (IRSAD) scores of the postcode of reported dogs for whom each complaint code was used, and the odds ratio and the 95% confidence interval (CI) of the IRSAD score in the logistic regression model of complaint codes. Outcomes of these models were different complaint codes and the fixed factor was the IRSAD score of the owners’ postcode.

| Complaint Code                  | IRSAD Score of the Owner’s Postcode When This Code Cited | IRSAD Score of the Owner’s Postcode When This Code Not Cited | IRSAD Odds Ratio and (CI) | p Value  |
|---------------------------------|-----------------------------------------------------------|---------------------------------------------------------------|---------------------------|----------|
| Abandonment                     | 976                                                       | 975                                                           | 1.0000 (0.9979, 1.0003)   | 0.143    |
| Dog fighting *                  | 969                                                       | 975                                                           | 0.9991 (0.9979, 1.0003)   | 0.143    |
| Cruel act †                     | 972                                                       | 975                                                           | 0.9994 (0.9991, 0.9997)   | <0.001   |
| Emergency relief                | 960                                                       | 975                                                           | 1.0000 (0.9979, 1.0003)   | 0.143    |
| Hot animal in car               | 975                                                       | 975                                                           | 1.0067 (1.0063, 1.0071)   | <0.001   |
| Insufficient food and/or water  | 971                                                       | 979                                                           | 1.0000 (0.9979, 1.0003)   | 0.143    |
| No exercise/confined/tethered   | 970                                                       | 979                                                           | 0.9979 (0.9977, 0.9982)   | <0.001   |
| No shelter                      | 973                                                       | 977                                                           | 0.9990 (0.9987, 0.9994)   | <0.001   |
| No treatment                    | 972                                                       | 977                                                           | 0.9986 (0.9983, 0.9989)   | <0.001   |
| Overcrowding                    | 968                                                       | 977                                                           | 0.9982 (0.9970, 0.9993)   | <0.002   |
| Poor dog condition              | 969                                                       | 979                                                           | 0.9974 (0.9972, 0.9976)   | <0.001   |
| Poor living condition           | 975                                                       | 977                                                           | 0.9996 (0.9993, 0.9998)   | 0.002    |

*Not selected by the binary logistic regression model (alpha value to enter > 0.15). †The IRSAD did not meet the assumption of being linear to the logit so was not included in the binary logistic regression model. ‡Dog fighting is a combined code including Causing captive animal to be injured/killed by dog, Dog fighting or other prohibited offence, Keeping or using an animal for blooding/coursing a dog, Knowingly allowing an animal to kill/injure another. §Cruel act is a combined code including Baiting/poisoning, cruelty, Prohibition order breached, Tail docking or other surgical procedure.
4. Discussion

4.1. Socioeconomic Status of Dog Owners

A better understanding of relationships between the socioeconomic status of dog owners and specific welfare issues could help to elucidate the reasons for the issues, as well as helping to target specific sectors of the population for education about dog welfare. Compared to the median IRSAD score across the entire Queensland state, our study group had significantly lower IRSAD scores, indicating that the reported dogs were in postcodes with inhabitants at a lower socioeconomic level. It is possible that dog owners generally come from postcodes with inhabitants at low socioeconomic status, but because not all welfare issues were more frequently reported in lower socioeconomic regions and one was more frequent in higher socioeconomic regions, we consider that there may be an important relationship between welfare issues and socioeconomic status.

The score differences contributed by the variables appear small, and the odds ratios for IRSAD scores in the regression model were close to one. This is probably because the distribution of IRSAD scores across different regions in Queensland is narrow, with an interquartile range of 71.1 and a standard deviation of just 64.8, compared with a range of 558. Also, our dataset only covers the coastal area of Queensland which is relatively homogenous in terms of the socioeconomic level of inhabitants. The difference between our median score and that in Queensland, 38.3, represents about 59% of one SD in that region. Since about 68% of values lie within 1 SD of the mean, it can be seen that the differences in IRSAD scores in the variables tested in this study are meaningful and reflect the range in values from a significant proportion of the total Queensland population, about 40% (68% × 59%).

Such a small difference is important because it should enable us to predict differences in commonly reported dog welfare concerns across populations and regions in a large and relatively homogenous area. The majority of previous studies have focused on socioeconomics and animal abuse [20,22,29]. The relationship between socioeconomic level and other welfare concerns in relation to canines [6] has received little research attention. This study may bridge this gap by determining some of the factors that relate to specific welfare concerns.

A key feature of the IRSAD score is that it might positively relate to the financial circumstances of the owner, notwithstanding the previously mentioned concern that the owner may not be represented by the status of the entire postcode, since it includes the % of people whose annual household income is < AUS $20,799 and whose rent is less than AUS $166/week [34]. This could indicate some constraints on the part of the owner in providing for the welfare of his or her dog, such as provision of adequate food, shelter, or other resources. This is discussed later in relation to individual complaint codes. The IRSAD score is also positively associated with the inhabitants’ educational level, a key component being whether the members of the household progressed past year 11 in school, assuming they were over 15 years of age. This could affect whether the owner has sufficient knowledge to care for his or her dog, providing suitable nutrition, for example. Important detractors in the IRSAD include unemployment and the percentage of employed people classified as “labourers” living in that postcode [34]. This could relate to whether the owner has sufficient financial resources to care for his or her dog. However, these results should be interpreted with caution because the IRSAD score relates to the entire postcode, which may include substantial variation within and between regions. Clearly the circumstance of the owner or owners may be different to that of other inhabitants in the postcode in question.

Broad correlations between socioeconomic status and human behaviour towards animals have been noted previously [6,40,41]. People with high socioeconomic levels are more likely to advocate for animal welfare and to volunteer for animals [40], whereas those with lower socioeconomic backgrounds are more likely to be involved in animal neglect and abuse [6]. Our findings are in agreement with these previous conclusions.

It is also important to remember that in this study we analyzed only reported data, i.e., alleged welfare issues, which may not all reflect actual cases. It is known that complainants will report a neighbour out of spite, misread a situation, or report actions which may not actually represent a
breach of the ACPA. The negative correlation between the socioeconomic status of the dog’s owner and the risk of most reported welfare issues may also be explained by the fact that individuals may be more prepared or likely to report welfare issues in low socioeconomic postcodes. Since household income, home ownership, and full-time employment were reported to negatively correlate with dog ownership, it is less likely that the higher number of reports in low socioeconomic regions is because people from low socioeconomic regions own more dogs [42]. However, the same study reported living in rural locations was associated with higher odds of owning a dog [42], and we found a tendency for low socioeconomic regions to overlap non-urban regions [43]. Therefore, the socioeconomic level and dwelling in rural regions may both increase the possibility of being reported; yet we could not validate these hypotheses as the IRSAD score is a generalization of postcode regions ignoring the within postcode variation. However, inconclusive results were reported in another study, that found that ones’ personal and household income levels were not associated with the propensity of being reported for animal cruelty [44].

4.2. Breed

Not only can socioeconomic level of dog owners be related to animal welfare concerns, it can also be linked with breed factors. Reported cases involving UB dogs were potentially related to owners being socioeconomically disadvantaged compared with cases involving RB dogs. Similar results of breeds’ predisposition to welfare concerns and socioeconomic levels were observed when we examined the RB dogs. Reported cases involving utility breeds, terriers, and working dogs were associated with the three least socioeconomically advantaged groups. Utility breeds, terriers, and working dogs were also more commonly reported for canine welfare concerns [27]. Although this study involved only reported but not confirmed cases, these results potentially support previous studies suggesting that people with lower income have higher risks of mistreating animals [20,22], which might be further associated with specific dog breeds, and linked to some breed-specific complaints [27]. Nevertheless, it is important to note that the differences in socioeconomic scores among different breed groups were statistically significant but small, and there may be some inaccuracies and biases when breeds were reported. Therefore, over-interpretation should be avoided.

4.3. Complaint Types

There were clear correlations between the socioeconomic level and complaint type being reported. For example, allegedly committing cruel acts was associated with lower socioeconomic level.

Previous research focusing on crime and animal cruelty has found negative relationships between the socioeconomic level and tendencies to commit crime, including being cruel to dogs and cats [22,45]. However, a study comparing animal cruelty between rural and urban regions found that rural residents mostly targeted cats rather than dogs [10], and another study investigating community demographics of animal cruelty reports found no differences among urban, town, and rural residents in the likelihood of being reported for animal cruelty [43].

Except for canine abuse, most complaints for which the owner was from a low socioeconomic background were neglect related. The aforementioned explanation is that people with lower socioeconomic backgrounds may lack the ability (e.g., money, space, or transportation) to manage animal care and welfare [6]. Moreover, this finding is in line with a previous study that people of lower socioeconomic status tended to moralize transgressions that did not cause obvious harm to animals [46,47]. Less affluent people may therefore be more likely to view an animal welfare compromise that is not overtly cruel as a moral but not a legal issue [6,46,47]. Consequently, there is a risk that people with lower socioeconomic backgrounds may tend to neglect the fundamental needs of their dogs, including failing to provide appropriate nutrients, adequate living conditions, and medical treatments, which increases the chance of them being reported. In this respect, the first of our hypotheses was supported, that complainants from relatively poor socioeconomic postcode regions would be more likely to complain about an absence of key resources for dogs. This may relate
to the factors included in the IRSAD score that are relevant to educational level. The IRSAD score of different postcodes across Australia is highly correlated with the Index of Education and Occupation score, with a Spearman’s rank correlation of 0.85 [34]. This indicates a potential relationship between the low levels of education and neglect-related canine welfare concerns, either because people who are less educated do not consider deprivation as an act of neglect, or they are simply lacking in knowledge about the welfare and care of dogs [6,29].

Among these neglect-related complaints, the finding associated with insufficient (medical) treatments seems contradictory to our previous study [27]. This study reveals that insufficient veterinary treatments were less commonly reported in regions of lower socioeconomic status, which is supported by the fact that household income limits owners’ access or willingness to provide veterinary care [48,49]. In addition, UB dogs were more commonly reported in lower socioeconomic regions. Consequently, it would be expected that UB dogs would be the subject of more complaints about poor veterinary care. However, according to our previous study, RB but not UB dogs were more likely to be reported with insufficient veterinary treatments [27]. The potential predisposition of RB dogs to a complaint about lack of veterinary care may be influenced not only by owners’ socioeconomic status, but also by other factors. These factors may include morality [10], attitudes to the welfare of breeding dogs [50], human–animal bond [49], and registration rate [51], which can outweigh or confound the effects of socioeconomic level. For instance, people who are affluent but have less moral conviction may prefer to purchase an RB dog from a breeder rather than adopting an UB dog from a shelter, and the owners with less moral conviction may be less likely to bring their sick dogs to a veterinary clinic [49]. Besides, the potentially low registration rate of UB dogs [27] may encourage owners to abandon their dogs when medical care is required, leading to a reduced but inaccurate prevalence of UB dogs being reported for lack of treatment. However, these hypotheses cannot be confirmed in this study as they were all reported not confirmed cases.

Another inconclusive finding was that the difference in socioeconomic levels between reported cases citing and not citing abandonment was small. Dog ownership is positively correlated to household income [30,42,52]. However, it has been suggested that people with lower household income are less likely to relinquish their dogs, for financial reasons [14]. Therefore, it has been argued that other variables, including problematic behaviours [15,53,54], nature of the dog [15,22,53], human factors [53,55], and the human–dog bond [14,56] may also play important roles in determining the benefits of dog ownership. This finding again supports the previous assumption that other factors also critically influence some complaint types.

Similarly, we hypothesized that complaints about ‘blood sports’, such as ‘Knowingly allowing an animal to kill/injure another’ and ‘Dog fighting or other prohibited offence’ would be associated with lower socioeconomic backgrounds. However, the IRSAD score did not significantly differ between reported cases cited and not cited with this code. Previous research exploring financial aspects of dog-fighting in the UK has pointed out that this kind of ‘blood sporting’ was more popular among working-class men, as a way of life and an alternative expression of masculinity [32]. Nevertheless, a small proportion of middle-class people might also be involved as business owners or as a hobby [32], and thus increase the average socioeconomic scores. In addition, only a small number of cases were reported involving those alleged complaints, with even fewer being confirmed [28]; thereby, it might not be enough to test for statistically significant differences with validity.

Although most complaints were related to socioeconomic disadvantaged people, one complaint type was reported more commonly among more socioeconomically advantaged people. Those with relatively higher socioeconomic levels were more likely to be reported leaving their dogs unattended in a hot car. This finding partially supports the previous study that people with higher socioeconomic level, mainly living in urban areas, are more likely to own cars and take their dogs for outdoor activities [41], and thus have a greater chance of leaving their dogs alone in a car. In high socioeconomic regions and in high density urban regions it would be more likely that owners are reported when they left their dogs in a vehicle in a busy public area.
Although this study reports unconfirmed dog welfare complaints, the results reflect the major welfare concerns in dog populations in higher or lower socioeconomic background. Considering the relevance of different complaint reasons and different socioeconomic levels, intervention strategies for the prevention of animal neglect or cruelty should be directed differently in high and low socioeconomic regions. Studies of confirmed welfare issues are required. Interventions are recommended to be taken in lower socioeconomic areas to explore whether the high number of reports is driven by actual offenses or by higher public awareness. These results can also be used to increase public awareness and promote public education. For instance, councils of relatively higher socioeconomic regions are recommended to place more emphasis on enforcing that people do not leave dogs in a hot vehicle unattended. Councils of relatively lower socioeconomic regions can highlight information for owners on the basic needs of dogs (e.g., the amount of water and food consumption). Another important implication of this study is that it provides information regarding the correlation of socioeconomic backgrounds and the preference for dog types, which could help develop more tailored educational programs that target different populations.

4.4. Limitations and Need for Future Research

Several limitations were identified in this study. First, the dataset consisted of cases reported but not confirmed, so results only reflect a likelihood of correlations between socioeconomics and different types of welfare concerns in dogs. Besides, the socioeconomic data was acquired by linking to the postcodes where an alleged welfare concern occurred (used as a proxy for the owners’ postcode), which appeared to be a generalization and might be an ecological fallacy. Therefore, the results should be cautiously interpreted. Future study could try to obtain a more direct measure of socioeconomic status, for example, the household income of each individual. Second, total numbers of residents in each postcode are not accurately known. Therefore, we cannot calculate the exact prevalence of each welfare issue in different areas. If the prevalence in certain regions is particularly high, then sampling bias may occur. Third, breed recognition was based on comments made by complainants or trained inspectors, which may not be accurate. Finally, the data was obtained from populations within Queensland, and thus wider geographical generalization should be made cautiously.

5. Conclusions

This dataset was analyzed based on reported but not confirmed cases of canine welfare concerns, so the results reflect the tendency rather than fact. Results correlate the socioeconomic level with different dog breeds. The relationships between socioeconomic levels and different complaint types are also identified. Reported dogs of unrecognizable breeds came from postcodes with lower socioeconomic status to those reporting dogs of recognizable breeds. Among RB dogs, reports concerning utility breeds, terriers, and working dogs were more common than dogs reported in socioeconomically disadvantaged areas, but it is not clear to what extent these breed groups are more prevalent in these areas. People living in lower socioeconomic regions were more likely to be reported to be involved in canine welfare concerns, especially neglect-related complaints, and abusing dogs. In contrast, people living in higher socioeconomic areas were more alleged to leave their dogs unattended in a hot vehicle. This study provides detailed information which may help in the development of tailored strategies for different populations to combat welfare concerns in dogs. However, the differences of socioeconomic level were relatively small so the results should be interpreted cautiously. Finally, more risk factors and their roles in different complaint types should also be identified in order to give a better picture of canine welfare concerns.

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Appendix A

Table A1. Description of each complaint code, alleging a welfare issue.

| Complaint Code | Description |
|----------------|-------------|
| Abandonment    | An animal was abandoned/left by the owner either at their abode or somewhere else such as in the bush. |
| Baiting/Poisoning | An animal was poisoned or planned to be poisoned. |
| Causing captive animal to be injured/killed by dog Cruelty | A person let a captive animal be injured/killed by a dog. |
| Dog fighting or other prohibited offence | A person was reported to have abused an animal. |
| Emergency relief | Emergency relief is required for an animal left unattended because its owner experienced an emergency (e.g., flood or being hit by a car). |
| Hot animal in car | An animal was left unattended in a car during hot weather. |
| Insufficient food and/or water | An animal has insufficient food and/or water. |
| Keeping or using animal for blooding/coursing a dog | A person used a live bait for blooding/coursing a dog. |
| Knowingly allowing an animal to kill/injure another | A person allows one animal to kill/injuring another one, and does nothing to stop them. |
| No exercise/confined/tethered | An animal is confined or tethered and not given a suitable amount of exercise. |
| No shelter | An animal is not provided with suitable shelter provisions. |
| No treatment | An animal did not receive appropriate medical treatment when needed. |
| Overcrowding | The number of animals was too high for the living space provided. |
| Poor dog condition | The general condition of an animal is poor. (e.g., messy/matted coat, pussy eyes, etc.) |
| Poor living condition | The living environment of the animal is poor. |
| Prohibition order breached | An owner violated a prohibition order. |
| Tail docking or other surgical procedure | Tail docking or other surgical procedure (e.g., declaw removal, etc.) was conducted on an animal. |
| Unknown | Unknown |

Appendix B

Table A2. Breed list.

| Breed Reported     | Associated Listed Breed | Breed Group |
|--------------------|-------------------------|-------------|
| Affenpinscher      | Affenpinscher           | Toys        |
| Afghan hound       | Afghan Hound            | Hounds      |
| Airedale terrier   | Airedale Terrier        | Terrier     |
| Akita              | Akita                   | Utility     |
| Alaskan husky      | Siberian Husky          | Utility     |
| Alaskan malamute   | Alaskan Malamute        | Utility     |
| American bulldog   | American Bulldog        | Non sporting |
| American foxhound  | Foxhound                | Hounds      |
| American pit bull terrier | Pit Bull Terrier      | Terrier     |

*a Prohibition order—A prohibition order is given by the court when a person convicted of an animal welfare offense must not possess any or specific animal for a prescribed period of time [8]*.
| Breed Reported                                    | Associated Listed Breed         | Breed Group   |
|-------------------------------------------------|---------------------------------|---------------|
| American Staffordshire terrier                   | Staffordshire Terrier           | Terrier       |
| American water spaniel                          | American Water Spaniel          | Gundogs       |
| Anatolian shepherd dog                          | Anatolian Shepherd Dog          | Utility       |
| Australian bandog                               | Cross Breed                     | UB            |
| Australian bulldog                              | Australian Bulldog              | Non sporting  |
| Australian bulldog cross                        | Australian Bulldog              | Non sporting  |
| Australian cattle dog                           | Australian Cattle Dog           | Working dogs  |
| Australian koolie                               | Coolie/Koolie                   | UB            |
| Australian sheepdog                             | Australian Sheepdog             | Working dogs  |
| Australian shepherd                            | Australian Shepherd             | Working dogs  |
| Australian silky terrier                        | Australian Silky Terrier        | Toys          |
| Australian stumpy tail cattle dog               | Australian Stumpy Tail Cattle Dog| Working dogs  |
| Australian terrier                             | Australian Terrier              | Terrier       |
| Bandogge mastiff                               | Cross Breed                     | UB            |
| Basenji                                        | Basenji                         | Hounds        |
| Basset fauve de bretagne                        | Basset Fauve De Bretagne        | Hounds        |
| Basset hound                                   | Basset Hound                    | Hounds        |
| Beagle                                         | Beagle                           | Hounds        |
| Bearded collie                                 | Bearded Collie                  | Working dogs  |
| Bedlington terrier                             | Bedlington Terrier              | Terrier       |
| Belgian shepherd                               | Belgian Shepherd                | Working dogs  |
| Belgian shepherd-Groenendael                    | Belgian Shepherd                | Working dogs  |
| Belgian shepherd-Laekenois                      | Belgian Shepherd                | Working dogs  |
| Belgian shepherd-Malinois                       | Belgian Shepherd                | Working dogs  |
| Belgian shepherd-Tervueren                      | Belgian Shepherd                | Working dogs  |
| Bernese mountain dog                            | Bernese Mountain Dog            | Utility       |
| Bichon frise                                   | Bichon Frise                    | Toys          |
| Bloodhound                                     | Bloodhound                      | Hounds        |
| Bluetick coohound                              | Bluetick Coohound               | Hounds        |
| Border collie                                  | Border Collie                   | Working dogs  |
| Border collie × Labrador                        | Border Collie                   | Working dogs  |
| Border collie, miniature                        | Border Collie                   | Working dogs  |
| Border terrier                                 | Border Terrier                  | Terrier       |
| Borzoi                                         | Borzoi                           | Hounds        |
| Boston terrier                                 | Boston Terrier                  | Non sporting  |
| Bouvier des flandres                            | Bouvier Des Flandres            | Working dogs  |
| Boxer                                          | Boxer                            | Utility       |
| Boxer cross                                    | Boxer                            | Utility       |
| Boxer × bullmastif                             | Boxer                            | Utility       |
| Boxer × American Staffordshire terrier          | Boxer                            | Utility       |
| Bracco Italiano                                | Bracco Italiano                 | Gundogs       |
| Briard                                         | Briard                           | Gundogs       |
| British bulldog                                | British Bulldog                 | Non sporting  |
| Brittany                                       | Britanny                        | Gundogs       |
| Bull Arab                                      | Bull Arab                       | UB            |
| Bull Arab × greyhound                          | Bull Arab                       | UB            |
| Bull terrier                                   | Bull terrier                    | Terrier       |
| Bull terrier cross                             | Bull terrier                    | Terrier       |
| Bull Terrier, Miniature                        | Bull terrier                    | Terrier       |
| Bulldog                                        | British bulldog                 | Non sporting  |
| Bulldog cross                                  | British bulldog                 | Non sporting  |
| Bullmastiff                                    | Bullmastiff                     | Utility       |
| Bullmastiff cross                              | Bullmastiff                     | Utility       |
| Bullmastiff × wolfhound × Great dane           | Bullmastiff                     | Utility       |
| Cane corso (Italian mastiff)                   | Cane corso                      | Utility       |
| Canaan dog                                     | Canaan dog                      | Non sporting  |
| Cairn terrier                                  | Cairn terrier                   | Terrier       |
| Cattle dog                                     | Australian cattle dog           | Working dogs  |
| Breed Reported                        | Associated Listed Breed       | Breed Group               |
|--------------------------------------|-------------------------------|---------------------------|
| Cattle dog cross                     | Australian cattle dog         | Working dogs              |
| Cavalier King Charles spaniel        | Cavalier King Charles spaniel | Toys                      |
| Central Asian shepherd dog           | Central Asian shepherd dog    | Utility                   |
| Cesky terrier                        | Cesky terrier                 | Terrier                   |
| Chesapeake bay retriever             | Chesapeake bay retriever      | Gundogs                   |
| Chihuahua                            | Chihuahua                     | Toys                      |
| Chihuahua cross                      | Chihuahua                     | Toys                      |
| Chihuahua × Jack Russell             | Chihuahua                     | Toys                      |
| Long hair chihuahua                  | Chihuahua                     | Toys                      |
| Chinese crested dog                  | Chinese crested dog           | Toys                      |
| Chinese crested dog—powder puff      | Chinese crested dog           | Toys                      |
| Chow chow                            | Chow chow                     | Non sporting              |
| Clumber spaniel                      | Clumber spaniel               | Gundogs                   |
| Cocker spaniel                       | Cocker spaniel                | Gundogs                   |
| Cocker spaniel, American             | Cocker spaniel                | Gundogs                   |
| Cocker spaniel, English              | Cocker spaniel                | Gundogs                   |
| Collie                               | Collie                        | Working dogs              |
| Collie rough                         | Collie                        | Working dogs              |
| Collie smooth                        | Collie                        | Working dogs              |
| Corgi                                | Corgi                         | Working dogs              |
| Corgi, Cardigan Welsh                | Corgi                         | Working dogs              |
| Corgi, Pembroke Welsh                | Corgi                         | Working dogs              |
| Corgi × fox Terrier                  | Corgi                         | Working dogs              |
| Coton de tulear                      | Coton de tulear               | Toys                      |
| Cross breed                          | Cross breed                   | UB                        |
| Curly coated retriever               | Curly coated retriever        | Gundogs                   |
| Dachshund                            | Dachshund                     | Hounds                    |
| Dachshund, long-haired               | Dachshund                     | Hounds                    |
| Dachshund, miniature                 | Dachshund                     | Hounds                    |
| Dalmatian                            | Dalmatian                     | Non sporting              |
| Dalmatian cross                      | Dalmatian                     | Non sporting              |
| Dandie dinmont terrier               | Dandie dinmont terrier        | Terrier                   |
| Deerhound                            | Deerhound                     | Hounds                    |
| Dingo                                | Cross breed                   | UB                        |
| Dingo cross                          | Cross breed                   | UB                        |
| Dobermann                            | Dobermann                     | Utility                   |
| Dogue de bordeaux                    | Dogue de bordeaux             | Utility                   |
| Dunker                               | Dunker                        | Hounds                    |
| Dutch shepherd                       | Dutch shepherd                | Working dogs              |
| English foxhound                     | Foxhound                      | Hounds                    |
| English pointer                      | English pointer               | Gundogs                   |
| English mastiff                      | English mastiff               | Utility                   |
| English setter                       | English setter                | Gundogs                   |
| English springer spaniel             | Springer spaniel              | Gundogs                   |
| English toy terrier                  | English toy terrier           | Toys                      |
| Field spaniel                        | Field spaniel                 | Gundogs                   |
| Finnish lapphund                     | Finnish lapphund              | Working dogs              |
| Flat coated retriever                | Flat coated retriever         | Gundogs                   |
| Formosan mountain dog (Taiwan Dog)   | Formosan mountain dog         | Utility                   |
| Fox Terrier                          | Fox terrier                   | Terrier                   |
| Fox terrier, smooth                  | Fox terrier                   | Terrier                   |
| Foxhound                             | Foxhound                      | Hounds                    |
| French bulldog                       | French bulldog                | Non sporting              |
| German coolie                        | Coolie/koolie                 | UB                        |
| German hunting terrier               | German hunting terrier        | Terrier                   |
| German pinscher                      | German pinscher               | Utility                   |
| German shepherd                      | German shepherd               | Working dogs              |
| Breed Reported                          | Associated Listed Breed                  | Breed Group   |
|----------------------------------------|------------------------------------------|---------------|
| German shepherd cross                  | German shepherd                          | Working dogs  |
| German shorthaired pointer             | German shorthaired/wirehaired pointer    | Gundogs       |
| German spitz                           | Spitz                                    | Non sporting  |
| German wirehaired pointer              | German shorthaired/wirehaired pointer    | Gundogs       |
| Glen of Imaal terrier                  | Glen of Imaal terrier                    | Terrier       |
| Golden retriever                       | Golden retriever                         | Gundogs       |
| Gordon setter                          | Gordon setter                            | Gundogs       |
| Great dane                             | Great dane                               | Non sporting  |
| Great dane × bull Arab                 | Great dane                               | Non sporting  |
| Great dane × bull mastiff              | Great dane                               | Non sporting  |
| Great pyrenees                         | Great pyrenees                           | Working dogs  |
| Greater Swiss mountain dog             | Greater Swiss mountain dog               | Working dogs  |
| Greyhound                              | Greyhound                                | Hounds        |
| Griffon bruxellois                     | Griffon bruxellois                       | Toys          |
| Harrier                                | Harrier                                  | Hounds        |
| Hungarian vizsla                       | Hungarian vizsla                         | Gundogs       |
| Husky                                  | Siberian husky                           | Utility       |
| Husky cross                            | Siberian husky                           | Utility       |
| Ibizan hound                           | Ibizan hound                             | Hounds        |
| Irish red & white setter               | Irish setter                             | Gundogs       |
| Irish setter                           | Irish setter                             | Gundogs       |
| Irish terrier                          | Irish terrier                            | Terrier       |
| Irish water spaniel                    | Irish water spaniel                      | Gundogs       |
| Irish wolfhound                        | Irish wolfhound                          | Hounds        |
| Italian greyhound                      | Italian greyhound                        | Toys          |
| Italian spinone                        | Italian spinone                          | Gundogs       |
| Jack Russell terrier                   | Jack Russell terrier                     | Terrier       |
| Japanese chin                          | Japanese chin                            | Toys          |
| Kangal shepherd dog                    | Kangal shepherd dog                      | Utility       |
| Keeshond                               | Keeshond                                 | Non sporting  |
| Kelpie                                 | Kelpie                                   | Working dogs  |
| Kelpie cross                           | Kelpie                                   | Working dogs  |
| Kelpie × Staffordshire terrier         | Kelpie                                   | Working dogs  |
| Kelpie × border collie                 | Kelpie                                   | Working dogs  |
| Kelpie × cattle dog                    | Kelpie                                   | Working dogs  |
| Kelpie × labrador                       | Kelpie                                   | Working dogs  |
| Kelpie × dingo                         | Kelpie                                   | Working dogs  |
| Kerry blue terrier                     | Kerry blue terrier                       | Terrier       |
| King Charles spaniel                   | King Charles spaniel                     | Toys          |
| Kuvasz                                 | Kuvasz                                   | Working dogs  |
| Labrador retriever                     | Labrador retriever                       | Gundogs       |
| Labrador retriever cross               | Labrador retriever                       | Gundogs       |
| Labradoodle                            | Labrador retriever                       | Gundogs       |
| Lagotto Romagnolo                      | Lagotto Romagnolo                        | Gundogs       |
| Lakeland terrier                       | Lakeland terrier                         | Terrier       |
| Large Munsterlander                    | Large Munsterlander                      | Gundogs       |
| Leonberger                             | Leonberger                               | Utility       |
| Large terrier cross                    | Terrier                                  | Terrier       |
| Lancashire heeler                      | Lancashire heeler                        | Working dogs  |
| Lhasa apso                             | Lhasa apso                               | Non sporting  |
| Louisiana Catahoula leopard dog        | Louisiana Catahoula leopard dog           | Working dogs  |
| Löwchen                                | Löwchen                                  | Toys          |
| Lurcher                                | Cross breed                              | UB            |
Table A2. Cont.

| Breed Reported          | Associated Listed Breed          | Breed Group      |
|-------------------------|----------------------------------|-----------------|
| Maltese                 | Maltese                          | Toys            |
| Maltese cross           | Maltese                          | Toys            |
| Manchester terrier      | Manchester terrier               | Terrier         |
| Maremma sheepdog        | Maremma sheepdog                  | Working dogs    |
| Mastiff                 | Mastiff                          | Utility         |
| Mastiff cross           | Mastiff                          | Utility         |
| Mastiff × bull Arab     | Mastiff                          | Utility         |
| Medium terrier          | Terrier                          | Terrier         |
| Medium terrier cross    | Terrier                          | Terrier         |
| Miniature fox terrier   | Fox Terrier                       | Terrier         |
| Miniature pinscher      | Miniature pinscher               | Toys            |
| Neapolitan mastiff      | Neapolitan mastiff               | Utility         |
| New Zealand huntaway    | New Zealand huntaway             | Working dogs    |
| Newfoundland            | Newfoundland                      | Utility         |
| Norfolk terrier         | Norfolk terrier                   | Terrier         |
| North Queensland bullhound | Cross breed                | UB             |
| Norwegian elkhound      | Norwegian elkhound                | Hounds          |
| Norwich terrier         | Norwegian elkhound                | Terrier         |
| Nova Scotia duck tolling retriever | Nova Scotia duck tolling retriever | Gundogs         |
| Old English sheepdog    | Old English sheepdog              | Working dogs    |
| Papillon                | Papillon                          | Toys            |
| Parson Russell terrier  | Parson Russell terrier            | Terrier         |
| Pekingese               | Pekingese                         | Toys            |
| Peruvian hairless dog   | Peruvian hairless dog             | Hounds          |
| Petit basset griffon vendeen | Petit basset griffon vendeen | Hounds          |
| Pharaoh hound           | Pharaoh hound                      | Hounds          |
| Pit bull terrier        | Pit bull terrier                   | Terrier         |
| Pug dog                 | Cross breed                        | Terrier         |
| Pointer                 | Pointer                           | Gundogs         |
| Polish lowland sheepdog | Polish lowland sheepdog           | Working dogs    |
| Pomeranian              | Pomeranian                         | Toys            |
| Poodle                  | Poodle                            | Non sporting    |
| Poodle toy              | Poodle                            | Non sporting    |
| Poodle miniature        | Poodle                            | Non sporting    |
| Poodle standard         | Poodle                            | Non sporting    |
| Poodle × Shih Tzu       | Poodle                            | Non sporting    |
| Portuguese podengo      | Portuguese podengo                | Hounds          |
| Portuguese water dog    | Portuguese water dog              | Utility         |
| Pug                     | Pug                               | Toys            |
| Pul                                | Puli                              | UB              |
| Prague ratter           | Cross breed                        | Utility         |
| Pyrenean mastiff        | Pyrenean mastiff                   | Utility         |
| Pyrenean mountain dog   | Pyrenean mountain dog              | Utility         |
| Rhodesian ridgeback     | Rhodesian ridgeback               | Hounds          |
| Rottweiler              | Rottweiler                        | Utility         |
| Rottweiler × mastiff    | Rottweiler                        | Utility         |
| Russian black terrier   | Russian black terrier             | Utility         |
| Saint bernard           | Saint bernard                      | Utility         |
| Saluki                  | Saluki                            | Hounds          |
| Samoyed                 | Samoyed                           | Utility         |
| Sarplaninac             | Sarplaninac                       | Utility         |
| Schipperke              | Schipperke                        | Non sporting    |
| Schnauzer               | Schnauzer                         | Utility         |
| Schnauzer, miniature    | Schnauzer                         | Utility         |
| Schnauzer, standard     | Schnauzer                         | Utility         |
| Schnauzer, giant        | Schnauzer                         | Utility         |
| Scottish terrier        | Scottish terrier                  | Terrier         |
| Sealyham terrier        | Sealyham terrier                  | Terrier         |
| Shar pei                | Shar pei                          | Non sporting    |
### Table A2. Cont.

| Breed Reported | Associated Listed Breed | Breed Group |
|----------------|-------------------------|-------------|
| Shar Pei cross | Shar pei                | Non sporting|
| Shetland sheepdog | Shetland sheepdog     | Working dogs|
| Shiba Inu       | Shiba Inu               | Utility     |
| Shih tzu        | Shih tzu                | Non sporting|
| Shih tzu × maltese | Shih tzu              | Non sporting|
| Siberian husky  | Siberian husky          | Utility     |
| Skye terrier    | Skye terrier            | Terrier     |
| Sloughi         | Sloughi                 | Hounds      |
| Small terrier cross | Terrier             | Terrier     |
| Smithfield cattle dog | Cross breed    | UB          |
| Soft coated wheaten terrier | Soft coated wheaten terrier | Terrier     |
| Spanish water dog | Spanish water dog      | Gundogs     |
| Spitz           | Spitz                   | Non sporting|
| Spoodle         | Cocker spaniel          | Gundogs     |
| Staffordshire bull terrier | American Staffordshire bull terrier | Terrier     |
| Staffordshire bull terrier × labrador | American Staffordshire bull terrier | Terrier     |
| Staghound       | Staghound               | UB          |
| Swedish vallhund | Swedish vallhund       | Working dogs|
| Tenterfield terrier | Tenterfield terrier   | Terrier     |
| Thai ridgeback  | Thai ridgeback          | Hounds      |
| Tibetan mastiff | Tibetan mastiff         | Utility     |
| Tibetan spaniel | Tibetan spaniel         | Toys        |
| Tibetan terrier | Tibetan terrier         | Non sporting|
| Timber shepherd | Cross breed             | UB          |
| Weimaraner      | Weimaraner              | Gundogs     |
| Welsh springer spaniel | Springer spaniel      | Gundogs     |
| Welsh terrier   | Welsh terrier           | Terrier     |
| West highland white terrier | West highland white terrier | Terrier     |
| Whippet         | Whippet                 | Hounds      |
| White Swiss shepherd dog | White Swiss shepherd dog | Working dogs|
| Wirehaired fox terrier | Fox terrier          | Terrier     |
| Xoloitzcuintle  | Xoloitzcuintle          | Non sporting|
| Yorkshire terrier | Yorkshire terrier      | Toys        |

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