11-2017

Surveys of the Street and Private Dog Population: Kalhaar Bungalows, Gujarat India

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THE HUMANE SOCIETY
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November 2017

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Executive summary

This baseline survey was conducted on the 27th and 28th of November, 2017 to generate a dog population size estimate and collect baseline data on the composition of the dog population. We estimate that there are 48 street dogs in the Kalhaar Bungalows area (all the sectors of Kalhaar Bungalows). This translates to about 6 dogs per 100 residents in the Kalhaar Bungalows area. Sterilization rates were high with 90% of the dogs being sterilized and 84% of the female population. The street dog survey was conducted by walking along all the streets of the Kalhaar Bungalows. We teamed-up with local volunteers, who were aware of the location of each dog. A Sight Re-sight experiment was also conducted using photographs of 14 dogs with unique markings encountered on the first day. On the second day photographs were compared and matched if possible to generate a detectability. The resulting detectability of 0.9285 is very high. Body condition scores were overall good with no dogs showing signs of malnutrition or low body weight. Although November is the peak of the dog breeding season India, we only found one lactating female with days old puppies (pups are not included in the estimate because pups survival is very low). Skin conditions were absent except for one male dog who showed a skin infection.

A private dog demographics and KAP (Knowledge, Attitudes and Practices) survey was conducted on 17th December, 2017. Household surveys are important as they are a reliable tool to generate pet population estimates. Further, they enable us to explore common attitudes towards street dogs and issues residents may be concerned about. We chose a random sample method and interviewed 88 households across the sections 1-3. An additional census survey is going to be undertaken in mid-January to generate a total number of private dogs in the Kalhaar Bungalows. A private dog population report will follow. However, KAP results are presented in this report.
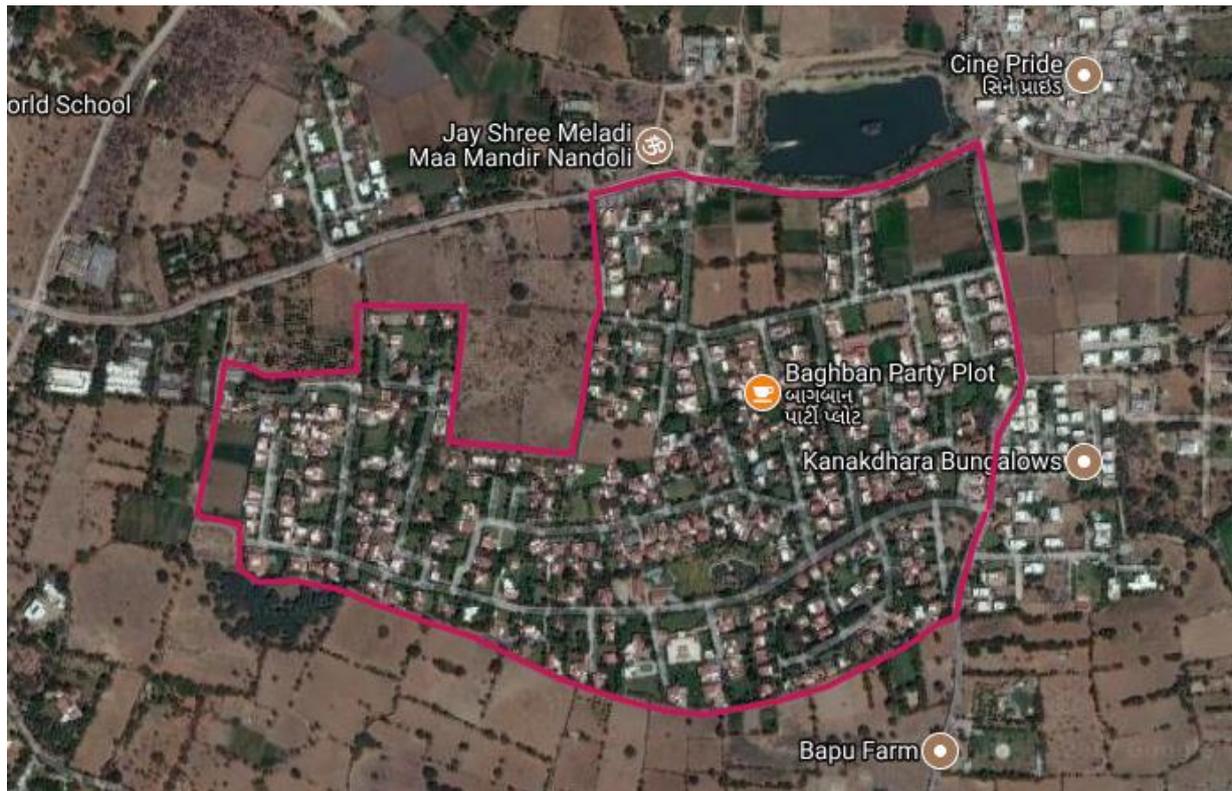
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Background

Kalhaar Bungalows is located near the Shilaj village, about 15 km west of Ahmedabad, the largest city and former capital of the state of Gujarat (Fig. 1 & 2).

Figure 1: Geographic location of Kalhaar Bungalows indicated by the red marker

Figure 2: Google earth image of the survey area

Objectives

Objectives for the survey were as follows:

- Generate estimated number of dogs living at the Kalhaar Bungalows
- Collect baseline data on dog welfare indicators and sterilization status
- To identify the common areas where the majority of the dogs live/play/roam
- To identify problems between residents and street dogs and inform sustainable solutions
- To inform a humane and evidence based dog management program

Survey Design and Methodology

HSI conducted two surveys in the Kalhaar Bungalows, India in November and December 2017. A dog demographic and KAP (Knowledge, Attitude and Practices) survey, and a street dog survey. KAP surveys survey the private dog population as well as the attitudes and behaviours of humans in regards to dog demographics, the reproductive status of private dogs, the rate of dog bites and the relationship residents of Jamnagar have with their own private dogs and with street dogs.

Street Dog Survey

To generate a dog abundance estimate (total dog population size) we created set routes, also called index or standard routes, in Google Maps along residential roads and highways but avoiding expressways (dogs tend to avoid these roads). Routes are marked with a starting (flag) and end point (police officer). For easy access, the routes are saved as KML files and stored in Google My Places, which can be accessed from smart phones (online and offline). A survey team, consisting of a driver and an observer mounted on motorcycles, conducted the surveys early in the morning during the dawn hours. The observer uses both the Google Maps app and the OSM Tracker app on a mobile phone. OSM tracker is an application that enables the observer to record a dog sighting and relevant specifics about a dog (female, male or unknown adult, sterile/notched female or sterile/notched male, pup, lactating) as well as recording welfare indicators such as skin problems and body condition scores (BCS1 to BCS5). These are saved together with GPS coordinates of the sighted dog. OSM Tracker produces a track record of all sighted dogs and their specifics along the route which was followed during the survey. The data is subsequently downloaded and stored in an Access database for analysis. The survey route was surveyed on two consecutive days, by the same survey team, to measure variability and power to detect change.

Dog demographics and KAP survey

The survey was conducted using the smart phone app Epicollect5, which contained a prepared survey form for Jamnagar. Households were surveyed by a team of two trained surveyors using questionnaires about 15-25 mins in length. Questionnaires included or excluded questions depending on whether the household owned a dog or not. Inclusion criteria for households were:
- Person interviewed had to be over 18 years old and resident at the address
- In case of dog ownership, the interviewee had to be the main care taker or at least well informed about the dog or dogs in the household

Participants were asked to confirm their consent to be part of the study and had the option to opt-out before the interview started. Once questionnaires were completed, the completed forms were saved and uploaded to a cloud-based database by the surveyor.

Household surveys were conducted with a systematic random sampling method, which samples a portion of the total available households in the area. Following the same route that was created for the street dog survey, surveyors interviewed every tenth household. To remain consistent throughout the survey either the left or the right side of the street was surveyed. In case nobody was available at the tenth household, the ninth or the eleventh household was interviewed instead.

Systematic random sampling in comparison to simple random sampling is less susceptible to researcher error.

Results

Street dog survey

Total dog population sizes are important in terms of planning an intervention; however they also give us some indication of the 'conflict' potential. Humane Society International has been focusing and tracking this relationship between dog and human density and our results show that there is an inverse relationship between human density and dog density, in other words when human density increases dog density per 100 resident people tends to

decrease. The opposite effect is measurable in terms of dog bites per 100,000 people. As there is more potential to meet more dogs in lower human density areas (more dogs per 100 people), dog bite cases recorded in emergency rooms tend to increase. Sterilization programs, however have shown in many places around the world that fewer breeding dogs can result in fewer dog bites. In Jaipur for example, a maintained sterilization and vaccination program of 20+ years resulted in a declined dog population by about 50% and is, as of 2011, at about 1.6 dogs per 100 people (The Times of India, 2011). But additionally, the sterilization program was also associated with a significant decline in the rate of dog bites treated in city hospitals, because dog bites occurred more frequently in the months in which puppies were appealing and in reach of children but female dogs were still protecting their offspring (Reece et al., 2013).

In the Kalhaar Bungalows area we estimate a total street dog population of 48 dogs.

Table 1: Survey results corrected for detectability, generating a total population size estimate for the Kalhaar bungalows area.

Name	Date	Total dogs counted	Sterilized Dogs	Detectability	Estimated Dog Population
Kalhaar Bungalows	27/11/2017	45	39	0.9285	48.5
	28/11/2017	44	41	0.9285	47.4
Total/ Average		44.5			48

Composition of the street dog population

In this baseline survey we collected data on different welfare indicators, which can be monitored to evaluate the program's progress and success in the future. Important indicators are the percentage of dogs being sterilized, which should increase over time, as well as the percentage of lactating females and two easily observable welfare indicators, the proportion of dogs with a low body condition score and skin infections.

The survey results show a quite common composition, with more male dogs in the population compared to females (Tab.2). As the majority of the dogs were sterilized already and only one female was lactating.

Table 2: Raw counts of dog types and male to female ratios for the survey areas

| Name	Date	Male	Female	Lactating females	Male Sterilized	Female Sterilized	Unknown	Total count
	27/11/2017	3	1	1	31	8	1	45
Kalhaar Bungalows	28/11/2017	1	1	1	28	13	0	44

Table 3: Proportion of dogs sterilized, lactating and the two welfare indicators body condition score and skin issues.

Name	Date	% Total dogs sterilized	% Sterilized females	% Lactating females	% Body condition score C1 or C2	% Skin of dogs with skin conditions
	27/11/2017	88.6	80.0	10.00	0	2.3
Kalhaar Bungalows	28/11/2017	93.2	86.7	6.67	0	2.3
Total/ Average						

Spatial distribution of dogs in the three study areas

As described in the methodology section, when surveyors encounter dogs on their survey routes, details for each dog is recorded and stored with a GPS location in the OSM tracker and later on stored in an Access database. Figure 4 shows the recorded dogs encountered in the survey areas. Each dog colour represents a certain type of dog as follows: green = female notched/sterilized; yellow = female no notched ear; red = lactating female; black = male notched/sterilized; blue = male no notched ear.

Figure 4: Recorded dogs in OSM Tracker along the survey routes.
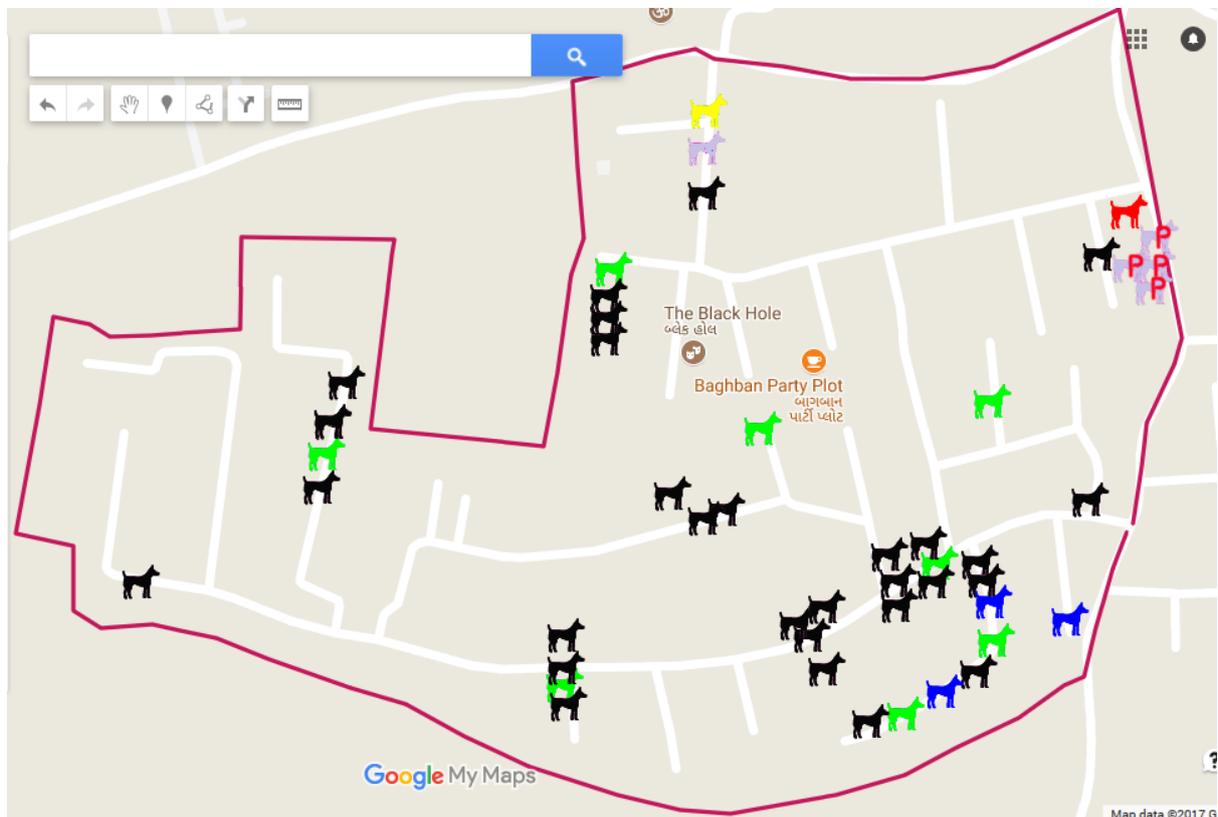
KAP (Knowledge, Attitude and Practices) Survey

We interviewed 88 households, of which 15 (17%) owned a dog. These 15 households owned 20 dogs.

There were slightly more female (55%) survey participants than males (45%). Dog owners owned dogs for two reasons either to protect the house (13%, 2) or as companions/pets (87%, 13). Among other reasons, no-dog owning households did not own a dog because they have no need for a dog (41%, 30), do not like dogs (33%, 24) or owned a dog in the past but not currently (15%, 11).

Dog bites and Rabies Prevention

In general, households experienced a low incidence of dog bites with 2% (2) reporting that one of the household members had experienced a dog bite in the previous 12 months. One of the dog bites was caused by the own dog and the other by an unknown strange dog

Survey participants were overall well educated how to treat a dog bite, with 56% (49) of all interviewees following the right procedure and another 35% (31) who would immediately go to the hospital.

Human-Dog Relationship: With private and street dogs

Perception of street dog density and previous dog management

Most interviewees (67%, 59) reported that they see about 4-6 dogs in their streets in the early morning hours. About 15% (13) see 0-3 dogs, 11% (10) see 7-10 dogs and only 7% (6) see more than 10 dogs in their street.

When asked how they felt about the number of dogs on their street, the majority of respondents (51%, 45) were not concerned about the number of dogs in their street and felt that there were not too many nor too few. Five percent (5%, 4) even thought that there were too few dogs on their street. Twenty-six percent (26%, 23) felt that there were too many dogs in their streets and another 18% (16) felt that there were far too many dogs on the street they live.

When asked whether the number of dogs on the streets had changed in the last 12 months, 34% (30) thought that it had stayed about the same, 5% (4) thought the number had decreased, 19.8 % (78) thought the number had increased and 8% (7) did not know or did not pay attention to the number of dogs.

To explore how the turnover of dogs is perceived by participants we asked what kind of dogs these dogs are. The majority (78%, 69) always see the same group of dogs and 11% (10) mostly see the same dogs but would also recognize if there would be strange dog. Another 8% (7) interviewees always see different dogs and 2% (2) always see the same dog.

Opinions on how street dogs should be managed were very diverse (Figure 1). Half the interviewees did not feel that street dogs need to be removed (48%, 42). They did not perceive them as a problem or have the feeling the dogs needed help or were of the opinion that sterilizing, vaccinating and releasing them again is the best way to manage street dogs. Others (13%, 11) would like to decrease the number of dogs by removing them and adopting them out, whereas 22% (19) would not mind to kill the dogs to have no dogs on the streets. Another 12 % would like to see either fewer dogs on the streets or better care for street dogs

but do not know the best way to do it and another 6% was not sure how they felt about managing street dogs.

Figure 1: Do you think street dogs should be managed and if so how?
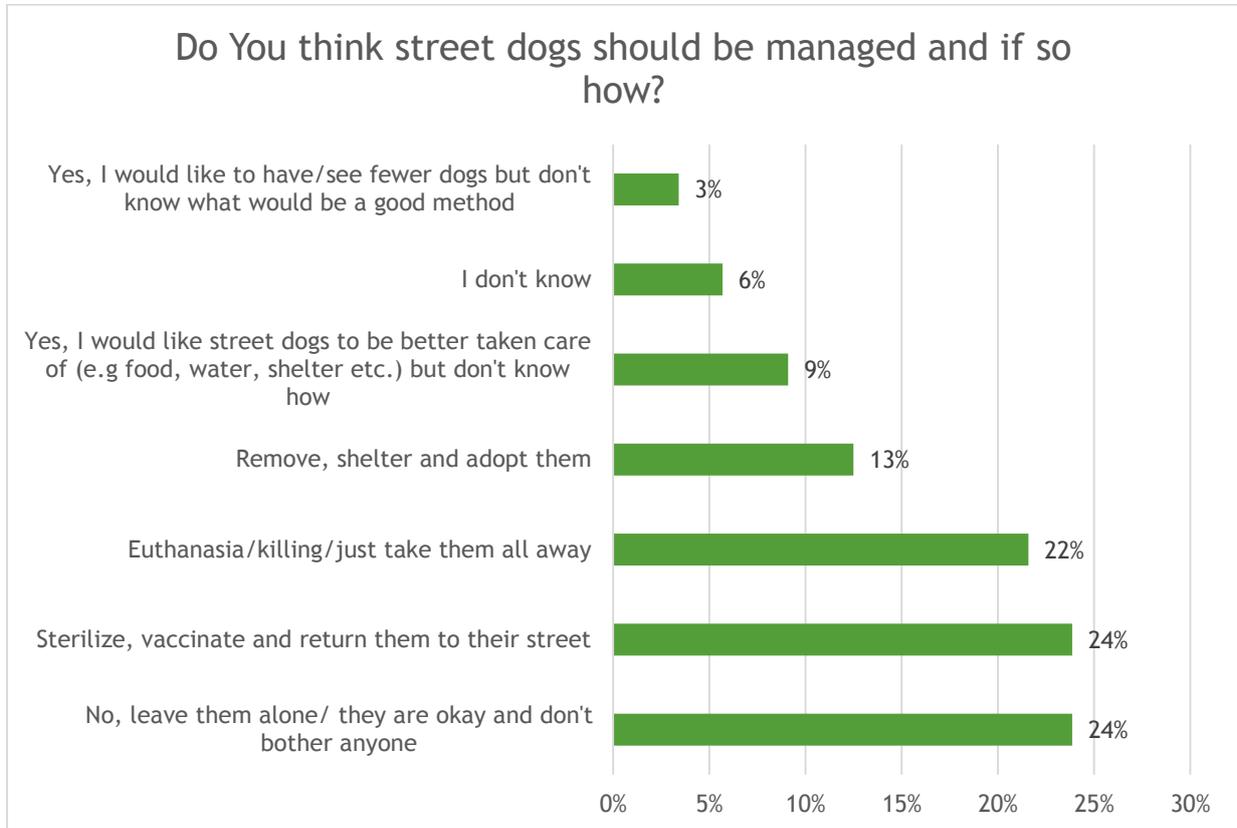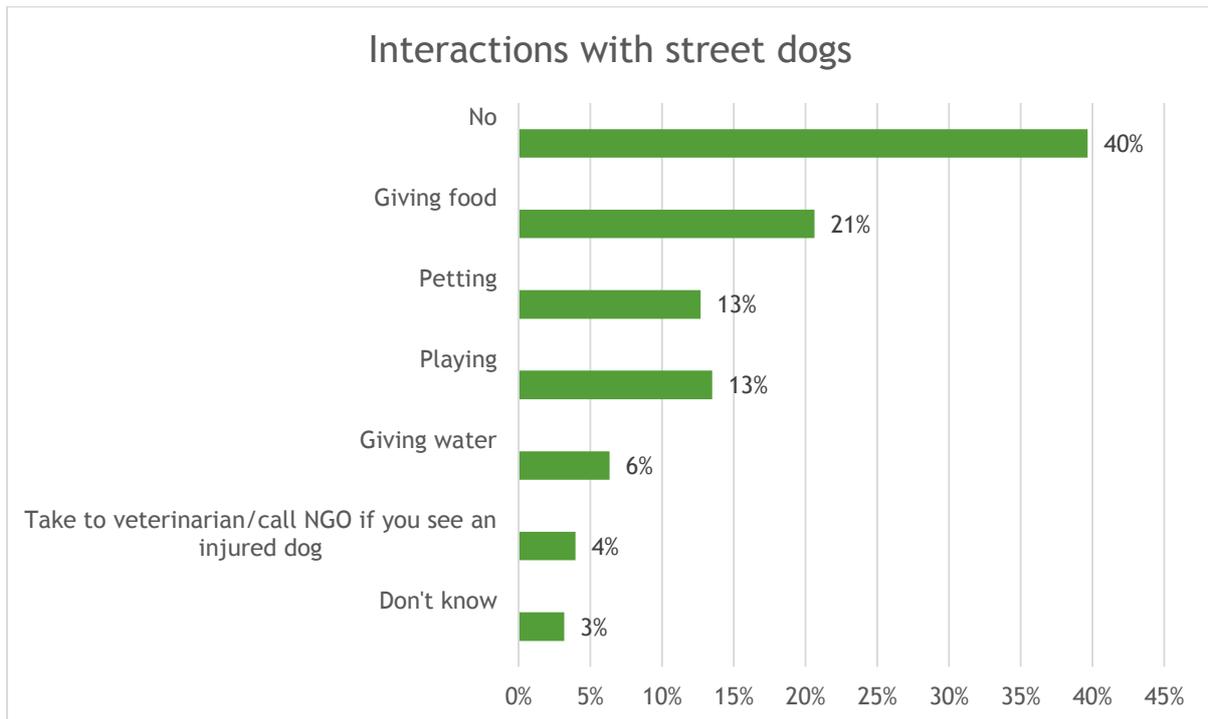

Positive interactions with street dogs

The questionnaire included several questions on the level of interaction and the care respondents devoted to street dogs.

Many interviewees feed street dogs regularly (8% - every day, 32% - sometimes and 3% - once a week), however 57% never feed street dogs.

Dog feeders commonly reported that, beyond providing food, they do not touch or pet the dog, 39% (15) never tried to touch the dogs they feed. However, 21% (8) reported that they sometimes touch the dog or dogs they feed and another 13% (5) think they could touch the dog if they wanted to. Only 26% (10) explicitly said that they would not want to touch the dog.

The interviewee was asked if s/he or other members of the household, including children, ever interacted with street dogs in any of the stated ways (Figure 2). About half of the households did not interact at all with street dogs (40%, 50). However 26% (33) of the households interact physically with street dogs by either petting or playing with them.

Figure 2: Do you, your children or other members of the household ever interact with street dogs in the following ways? (Multiple answers possible)

Negative interactions with street dogs

Many interviewees felt that they were never threatened by street dogs (34%, 30), whereas 26% (23) often and 22% (19) sometimes felt threatened. Only 9 % (8) felt that they are always threatened and another 9% (8) rarely felt threatened by street dogs

By far the most common concern in these circumstances, in which the interviewee felt threatened, was getting bitten by a street dog (24%, 19) and growling/barking dogs (26%, 21). Although rabies is a fatal disease no interviewee mentioned rabies as a concern.

Attitudes towards street dogs

To quantify attitudes of interviewees regarding street dogs and street dog management, the questionnaire included 6 Likert items with five answer options, from strongly agree, agree, don't know/neutral, disagree to strongly disagree. The results are summarized in table 4.

A composite mean attitude score can be calculated for each respondent by appointing numerical values to the answers to generate a mean score, however its usefulness is questionable on a number of issues including the assumption that there are equal differences between answer choices. We refrain from such analysis but compare the statements instead.

How answers were distributed for each statement as percentages can be found in table 4, which generally shows that most interviewees do not think that dogs are intrinsically the problem (statement 6). However, there seems to be a division among interviewees whether street dogs are a danger (46.6% agreed and 47.8% disagreed) or a part of the community (52.3% agreed and 44.3% disagreed that street dogs are part of the community). Similarly, there seems to be a division whether street dogs should remain on the streets or should be removed (51.1% agreed that street dogs should be removed and 43.1% disagreed). Overall, however, interviewees seemed to agree that sterilization and release should be the dog management method, the majority (72.8%) agreed and only 25% disagreed with this statement while only 2.3% did not know.

Table 4: Percentage of responses for each attitude statement (Note: Statement 1 and 3 are negative).

	1. Street dogs are a danger to people where I live	2. Street dogs are a part of my community and are not a problem	3. Street dogs should be removed from the streets	4. Street dogs should be sterilized and left on the streets	5. Street dogs are treated badly in my community	6. Street dogs are not the problem but how humans behave around them
Strongly Agree	11.4%	18.2%	26.1%	33.0%	6.8%	33.0%
Agree	35.2%	34.1%	25.0%	39.8%	20.5%	33.0%
Don't know	5.7%	3.4%	5.7%	2.3%	14.8%	9.1%
Disagree	27.3%	30.7%	29.5%	15.9%	31.8%	17.0%
Strongly Disagree	20.5%	13.6%	13.6%	9.1%	26.1%	8.0%

Figure 3: Attitude statement responses colour coded for whether interviewees responded positively (strongly agree and agree) = green, neutral (I do not know) = grey or negatively (disagree and strongly disagree) = red, towards street dogs. (Note: Question 1 and 3 need to be reversely interpreted because the statement was negatively worded)
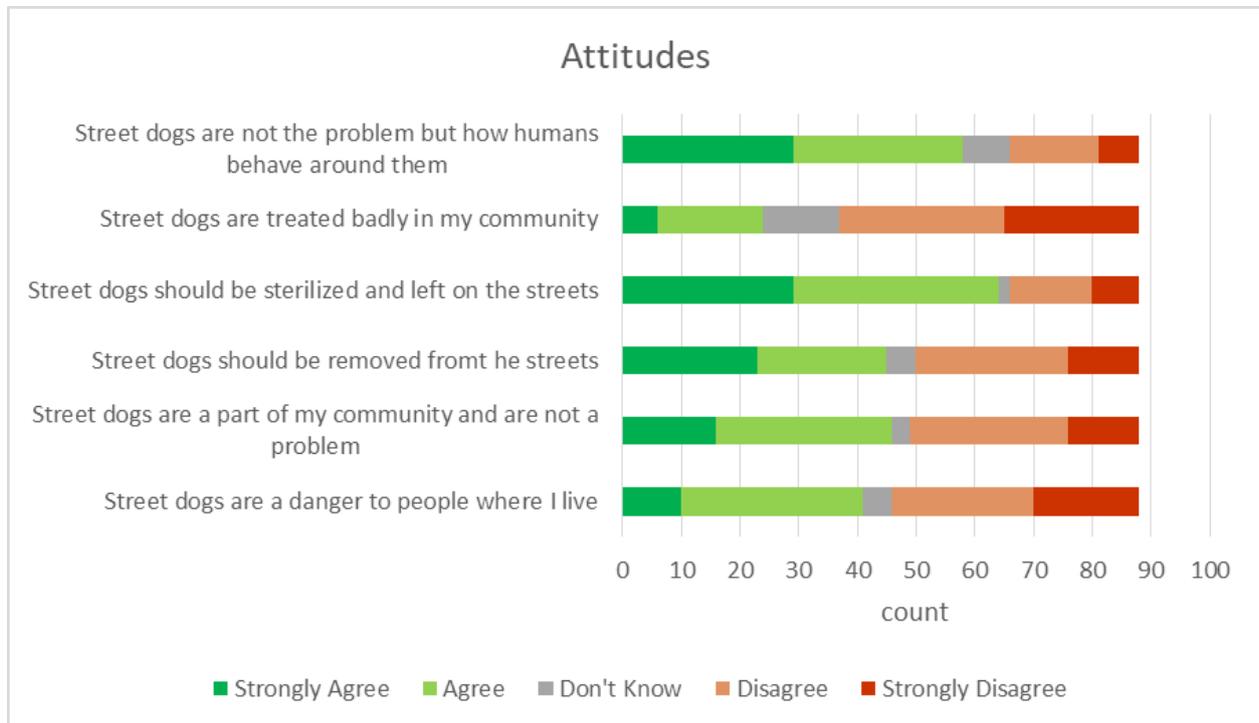
Discussion

Sterilization rates are exceptionally high, with 84% of the females being sterilized and only one female nursing puppies in the peak puppy season. Welfare indicators also show that dogs in Kalhaar Bungalows are in good health. If not yet introduced, a deworming program could be established to increase public health in the Kalhaar Bunglows and increase public health.

Interviewees were mostly concerned with dog bites, barking dogs and to a lesser degree sanitation. While better sanitation can be easily established, through for example community cleaning schedules or similar efforts, dog behaviour change will need more involvement of individuals living in Kalhaar Bungalows.

Workshops and dog behaviour courses might provide insights in what certain behaviours mean and how we as humans can influence dog behaviour positively by changing our own behaviour. Studies of free roaming dogs have shown that street dog behaviour is often a reflection of how we interact with them and relate to them rather than how dogs have to behave.[1] However other behaviours, like barking at night, will need to be explored in more detail to understand the causes of e.g. the often called 'unnecessary' barking.

Overall, the Kalhaar Bungalows street dog population is very well managed in regards to veterinary care and food provision for the dogs. Interviewees report that it is a relatively stable dog population. Resident street dogs prevent unhealthy, unsterilized and possibly

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[1] E.g. Bonanni, R., & Cafazzo, S. (2014). The social organisation of a population of free-ranging dogs in a suburban area of Rome: a reassessment of the effects of domestication on dogs' behavior, The social dog: behaviour and cognition. Elsevier Inc, 65-104.

rabid dogs from entering the Kalhaar area and safeguard public health. Therefore, although many interviewees would prefer to remove the dogs, we strongly suggest to offer workshops and community meetings to improve the relationship between residents and the street dogs instead of opening space for unknown new dogs. A regular forum meeting can provide a place to discuss concerns and issues but more importantly a place where everyone can share positive solutions and experiences.