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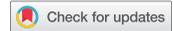
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Race and ethnicity are not primary determinants in utilizing veterinary services in underserved communities in the United States

Jessica L. Decker Sparks, Bridget Camacho, Philip Tedeschi, and Kevin N. Morris

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ABSTRACT

A retrospective database analysis (2011–2015) evaluated associations between race and ethnicity and veterinary service utilization by sampling 83,260 companion animals whose guardians (owners) self-identified as White, Black, or Latino/a from 39 Humane Society of the United States Pets for Life (PFL) sites across the United States. Controlling for socioeconomic status, the percentage of nonhuman animals sterilized through PFL whose owners were Latino/a or Black was substantially higher than in previously reported findings. While Latinos/as had the highest mean number of days from first contact with the program to consent, they also had the highest percentage of owners accepting the voucher during initial contact. Logistic regression models suggested that although meaningful, race and ethnicity were not primary determinants of veterinary service utilization. When veterinary and animal welfare organizations deliberately remove structural barriers embedded with racial inequalities, individuals, regardless of race and ethnicity, proceed with companion-animal sterilization. Therefore, service providers must use unbiased, informed, and culturally competent practices to improve companion-animal welfare through the optimization of veterinary services, including spay and neuter.

Introduction

The assumption that race and ethnicity are primary determinants in deciding to utilize veterinary services, including spay and neuter (S/N) surgeries, for companion animals (pets) is prevalent in the scientific literature (Baumann, n.d.; Faver, 2009; Hosey & Melfi, 2014; Ortega-Pacheco et al., 2007; Risley-Curtiss, Holley, & Wolf, 2006; Schoenfeld-Tacher, Kogan, & Wright, 2010; Trevejo, Yang, & Lund, 2011; Wolf, Lloyd, & Black, 2008). However, very few studies have specifically measured the role these factors play in utilizing veterinary care. An interview-based study conducted at two veterinary clinics in the United States and one in Mexico revealed that while Latino/a pet caregivers (owners) were just as likely as non-Latinos/as to classify their relationship with their dog or cat as companionship, their pets were more likely to be intact (Schoenfeld-Tacher et al., 2010).

Another random phone-survey study showed that participants who identified themselves as Latino/a were more likely to view their dog or cat as a form of protection and were 3.4 times more likely to not have their pet sterilized than Non-Latinos/as (Risley-Curtiss et al., 2006). Fewer studies exist discussing the Black community. However, the literature suggests that Black pet owners are approximately 10% less likely than White owners to use veterinary services, with no specific reference to S/N (Wolf et al., 2008).

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Other studies have indicated that race and ethnicity do not impact the decision to utilize veterinary services, including to S/N pets. A study analyzing data collected during an S/N program in a Latino/a colonia in El Paso, TX, revealed that initially, only 11% of pet dogs and 27% of pet cats were sterilized, whereas these figures increased to 47% of dogs and 38% of cats after an 8-month no-cost program (Poss & Bader, 2008). A systematic, random telephone-survey study conducted in the same colonia prior to the S/N intervention revealed that 90% or more of respondents endorsed sterilization for male and female dogs and cats (Poss & Bader, 2007). Another random phone-survey study conducted in the United States showed that race and ethnicity were not a barrier for participants, but that veterinary health care costs and language barriers were the primary obstacles to accessing veterinary health care for their pets (Landau et al., 2016). Lastly, a study of telephone interviews with 1,205 random participants in U.S. households revealed income as the greatest indicator of whether household cats were sterilized (Chu, Anderson, & Rieser, 2009). This group of studies suggests that high rates of intact dogs and cats within Latino/a and Black communities are not due to a refusal of S/N services based on cultural beliefs, but to the lack of accessibility and affordability of veterinary services for residents in lower socioeconomic-status communities.

A clear understanding of the roles of race and ethnicity as well as cultural competency in accessing veterinary services, or "understanding the specific cultural language, social and economic nuances of particular people and families" (Gallegos, 1982; National Association of Social Workers, n.d., para. 1), is critical for veterinarians and nonhuman animal welfare organizations to effectively market and optimize the use of veterinary services, including S/N. Biased sampling, nontransparent data analyses, and/or the use of nonvalidated survey instruments for the targeted populations are flaws of studies to date aimed at measuring how race and ethnicity affect decisions to S/N companion animals (Chu et al., 2009; Baumann, n.d.; Faver, 2009; Landau et al., 2016; Risley-Curtiss et al., 2006; Schoenfeld-Tacher et al., 2010).

The Humane Society of the United States (HSUS) Pets for Life (PFL) program works with local private-practice and nonprofit veterinarians to provide no-cost S/N surgeries, basic vaccinations, and discussions on proper pet health care and other medical services in 39 underserved communities where companion animals' S/N rates were less than 10% at the initiation of the program (HSUS, 2014). Data gathered for ongoing client tracking and program evaluation represent the most comprehensive opportunity to date to assess the impact that race and ethnicity have on the use of veterinary services. These data, which PFL collected following a consistent protocol, track the immediate decision to S/N as well as the hesitancy of participants prior to utilizing services. Because the data set is large, geographically representative, and ethnically diverse, with each community having similar socioeconomic-status conditions and the potential participants receiving a consistent offer for no-cost S/N services, it can be analyzed to more clearly isolate the role of race and ethnicity in participants' decision to use veterinary services.

Materials and methods

The PFL program uses a person-centered approach to reduce accessibility barriers to companion animal-care services (e.g., S/N, vaccinations, wellness exams, and behavioral training) in underserved communities (HSUS, 2014). The program's hallmarks include consistent door-to-door outreach; a visible and regular community presence that emphasizes trust building among PFL staff, clients, and community organizations; collaboration with local private-practice veterinarians; transportation services for pets to and from appointments; and an exhaustive follow-up process that puts the onus on PFL staff to ensure follow-through with scheduled appointments and services.

Once a client consents to S/N services for their dog and/or cat, PFL issues a voucher for a no-cost sterilization surgery. If the surgery is not scheduled immediately, PFL staff follow up within 24 hr to 48 hr to schedule the appointment. Staff members also contact clients 24 hr to 48 hr prior to the surgeries to confirm appointments. If appointments are a week or more away, staff initiate weekly contact to maintain client engagement. If a client cannot be reached by phone, PFL staff will make an

in-person visit. This methodology for the S/N component of PFL is consistent across all sites, regardless of demographic characteristics (HSUS, 2014).

Data were collected from 2011 to 2015 in PFL and PFL mentorship programs and associated sites operating in 39 communities throughout the United States (Figure 1; HSUS, 2014). Sites are defined by zip code and are consistent across a variety of socioeconomic criteria including crime statistics, education levels, and availability of and access to veterinary services and large pet-supply retail establishments. On average, 33% of residents in PFL sites live below the federal poverty level, approximately 90% of companion animals are intact, and very few, if any, veterinary services are present.

Initial contact between PFL and companion-animal owners occurs through community outreach events or door-to-door outreach. Between the initial contact, consent, and surgery completion, PFL remains engaged with owners through phone and home visits (HSUS, 2014). Data collected by PFL staff include race and ethnicity and the number of days between first contact with a client and their consent to have their pet spayed or neutered. The number of days between first contact with a client and completion of the sterilization surgery is not a reliable measure and therefore was not included in analyses because the surgery's scheduling can be impacted by the veterinarian's schedule, PFL's transportation schedule, and other factors beyond the owner's control. Currently, PFL has data on 97,886 pets across all of its communities. For this study, 14,626 pets were excluded because they were altered prior to contact with PFL or their altered status was unknown, resulting in a current sample size of 83,260 dogs and cats.

Analyses were performed on race and ethnicity data and days-to-consent-to-S/N data using the Statistical Package for the Social Sciences Version 23.0 (IBM, Armonk, NY). The sample's characteristics, both nonhuman animal and human, were summarized using descriptive statistics (Tables 1 and 2). For analyses including the human race and ethnicity variable, "Native American," "Asian," and "Other" categories were not reported due to substantially smaller subsample sizes and previous literature focusing almost exclusively on Latino/a and Black populations. With 8.1% of race and ethnicity data missing,
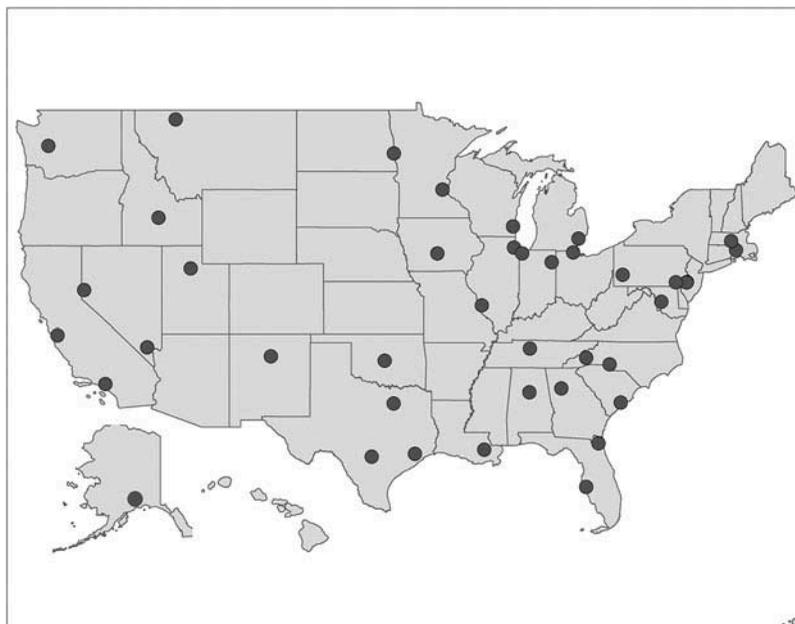
Figure 1. Map of the United States indicating the 39 Pets for Life (PFL) and PFL mentorship sites contributing data to the database, 2011–2015.

Table 1. Characteristics of unaltered companion animals engaged in the Pets for Life program.

Species	n (%)	Sex	n (%)
Cat	30,705 (36.9%)	Male	39,964 (48.0%)
Dog	52,146 (62.6%)	Female	42,606 (51.2%)
Missing	409 (0.5%)	Missing	690 (0.8%)

Table 2. Characteristics of human owners engaged in the Pets for Life program.

Ethnicity	n (%)	Sex	n (%)
White	15,835 (19.0%)	Male	24,704 (29.7%)
Latino/a	30,000 (36.0%)	Female	58,166 (69.9%)
Black	29,078 (34.9%)	Missing	390 (0.4%)
Native American	449 (0.5%)		
Asian	76 (0.1%)		
Other	1,102 (1.3%)		
Missing	6,720 (8.1%)		

correlations between dependent variables and other independent variables were performed, mimicking Little's Missing Completely at Random Test.

Results suggested that the data were missing at random. Missing cases were deleted listwise. Further, despite being a frequent focus in the literature, sex of the owners was not used in statistical analyses due to this variable's inconsistent meaning. For the PFL study, and likely similarly done in previously published studies, sex of the first owner to engage with the program was recorded. These data are problematic in an analysis, as they fail to recognize complex family systems and do not account for the sex of co-owners who may be influential in decision-making processes around companion-animal care.

Results

To date, 59,268 (71.2%) of unaltered animals whose owners engaged with the PFL program were spayed or neutered. Factored by race and ethnicity, 13,523 (85.4%) animals whose owners identified as White; 21,090 (70.3%) animals whose owners identified as Latino/a; and 19,832 (68.2%) animals whose owners identified as Black were surgically sterilized. To determine the impact of race and ethnicity on the binary outcome variable of interest (sterilization status), a multivariable logistic regression was performed. To control for confounders, pet sex, pet species, and region were included along with race and ethnicity in the model. Regions were classified according to the U.S. Census Bureau's (2016) guidelines. Sample selection controlled for owners' socioeconomic status, including education level. Sex of the owner was not controlled for due to the aforementioned critique.

Using the variables of race and ethnicity, pet sex, pet species, and region, a significant model was achieved, $X^2(8) = 139.9$, $p < .001$. When other predictor variables were held constant, participants' race and ethnicity, pet sex, and pet species were associated with the S/N outcome (Table 3). Dogs were 76% less likely to be spayed/neutered than cats; female pets were 15% more likely to be spayed than dogs were to be neutered; and Latino/as were 38% less likely and Blacks were 54% less likely to S/N their pets than Whites.

The Hosmer-Lemeshow (H-L) statistic indicated that the model was not a good fit, $X^2(6) = 258.7$, $p < .001$, while the c statistic = .513 and *Nagelkerke's* R^2 = .040, suggesting that although associated, race and ethnicity were not predictive of the S/N outcome.

Using odds ratios, pet species was a significant predictor of the sterilization outcome variable, with all races and ethnicities being more likely to S/N cats. Pet sex was also a significant predictor of sterilization for Latinos/as, Blacks, and Whites (Table 4). Latinos/as were 19% more likely, Blacks were 21% more likely, and Whites were 11% more likely to S/N female pets than male pets. Logistic regression findings from each of the 39 sites were consistent with the overall sample's findings.

Table 3. Multivariable logistic regression results.

	B	SE	Wald	df	Exp(B)	95% CI for Exp(B) Upper	Lower
Cat	Ref				1.0	Ref	
Dog	−1.45	0.22	4,388.8	1	0.24*	0.23	0.25
Male Pet	Ref				1.0	Ref	
Female Pet	1.37	0.02	64.1	1	1.15*	1.11	1.19
Ethnicity			805.2	2			
White	Ref				1.0	Ref	
Latino/a	−0.49	0.03	312.9	1	0.62*	0.58	0.65
Black	−0.77	0.03	803.9	1	0.46*	0.44	0.49
Region			5.07	3			
Northeast	Ref				1.0	Ref	
Midwest	0.22	0.02	3.39	1	1.24	1.19	1.31
South	0.13	0.02	2.41	1	1.13	1.08	1.20
West	0.26	0.03	3.80	1	1.30	1.24	1.38

B = slope; Exp(B) = odds ratio for the predictors; Ref = reference category.

Table 4. Odds ratios from logistic regressions of the sterilization-status outcome variable on race and ethnicity.

	Species effect			Sex effect		
		95% CI			95% CI	
	Odds Ratio	Lower	Upper	Odds Ratio	Lower	Upper
White	0.20*	0.18	0.22	1.11*	1.00	1.20
Latino/a	0.36*	0.34	0.39	1.19*	1.14	1.26
Black	0.18*	0.16	0.19	1.21*	1.15	1.27

*Significance at $p < .05$.

Additionally, of the owners whose animals were ultimately spayed and neutered, 15,498 (73.5%) pets whose owners were Latino/a; 13,761 (69.4%) pets whose owners were Black; and 8,123 (60.1%) pets whose owners were White accepted the voucher when first offered (Day 0). The 95th percentile for time between initial contact and consent to have pets spayed or neutered for pets whose owners were White was 468 days, with a range to 1,173 days for the top 5%; 434 days for pets whose owners were Latino/a, with a range to 1,665 days for the top 5%; and 425 days for pets whose owners were Black, with a range to 1,333 days for the top 5%. Whites had the lowest number of participants take more than 1,000 days to consent (18, 0.1%), while 77 (0.4%) Latinos and 112 (0.6%) Blacks took more than 1,000 days to consent.

For the subset of participants who did not consent on Day 0, a one-way analysis of variance indicated that race and ethnicity had a significant effect on mean number of days to consent, $F(2, 15,154) = 43.37$, $p < .001$, $\omega^2 = 0.06$. Dunnett T3 post-hoc tests yielded a significant difference between Latinos/as ($\overline{x} = 242.21$, $s = 256.04$) and Whites ($\overline{x} = 202.79$, $s = 213.71$), with Latino/as taking 39.42 days longer to consent ($p = .001$). Another significant difference between Latinos/as and Blacks ($\overline{x} = 202.70$, $s = 263.58$) was revealed, with Latinos/as taking 39.51 days longer to consent ($p < .001$). There was no significant difference in mean days to acceptance between Whites and Blacks. Overall, Black participants who did not accept the S/N voucher on Day 0 had the lowest mean number of days from first contact with PFL to consent.

Discussion

Pervasive and long-held assumptions about the cultural willingness of people of color to S/N companion animals have accompanied structural barriers to the delivery of veterinary services. Particularly concerning is the use of highly biased, denigrating language toward people of color in some S/N literature that improperly used qualitative methodologies to make sweeping statements (Schoenfeld-Tacher et al., 2010). Without detailed descriptions of iterative coding processes, the

quantification of qualitative data, or other standard data analysis techniques, these sweeping statements have the potential to perpetuate stereotypical assumptions. Though not well documented, it is likely that deep-rooted assumptions have created mistrust—similar to that exhibited in medical, public health, and social service utilization (Feagin & Bennefield, 2014; McKenzie & Bhui, 2007; Miller & Garran, 2008; Williams & Mohammed, 2013)—between the stigmatized groups (Latinos/as and Blacks) and the veterinary and animal welfare institutions that criticize them for not adopting the mainstream behavior to S/N their pets. Person-centered approaches aim to erode this distrust.

In the data analyzed here, although animals whose owners were White were more likely to be spayed or neutered according to regression models and had a higher S/N percentage than animals whose owners were Latino/a and Black, the percentage of animals sterilized through PFL whose owners were Latino/a and Black was substantially higher than previously reported findings (Baumann, n.d.; Faver, 2009; Landau et al., 2016; Ortega-Pacheco et al., 2007; Poss & Bader, 2008; Risley-Curtiss et al., 2006; Schoenfeld-Tacher et al., 2010; Wolf et al., 2008). The inferential H-L test's significant p value causes rejection of the test's null hypothesis that the logistic model fits the outcome and is corroborated by the low value of Nagelkerke's R^2.

With a c statistic value close to .5, the model's predictive ability is hardly better than randomly assigning observations to either the yes or no S/N categories. The consistency across parameters suggests that although meaningfully associated, race and ethnicity are not primary predictors. Pet species and sex appear to be confounders. All owners, regardless of race and ethnicity, were more likely to S/N cats. Conclusions that machismo creates an unwillingness among Latinos to neuter male pets (Schoenfeld-Tacher et al., 2010) are inaccurate, as findings from our study demonstrated that Latinos/as were not the only racial and ethnic group that were more likely to S/N female pets than male pets. Overall, Latino/a and Black S/N behaviors by species and pet sex were consistent with White S/N behaviors.

Analyses of the mean number of days between first contact with PFL and when an owner accepted a S/N voucher suggested that Latinos/as were most enthusiastic to accept the voucher when initially offered (Day 0). Latinos/as were also the most hesitant racial and ethnic group, having the highest maximum number of days between first contact and consent (1,665 days) and the largest spread in days among the top 5% (1,231 days) of all three groups, even though Blacks had a larger percentage of participants take longer than 1,000 days to consent. This finding suggests that even Latino/as who may typically be labeled as "holdouts" or "unwilling" are still likely to consent to S/N their pets when the right approach is taken.

Animals whose owners were Black also had a higher percentage of participants accepting the voucher on Day 0 than animals whose owners were White, but again, owners who were Black also had a higher maximum number of days to when they accepted the voucher compared with owners who were White. These findings indicated that preconceived notions that Latinos/as and Blacks are inherently resistant to S/N their pets because of cultural beliefs are false. Instead, when socioeconomic barriers (e.g., prohibitive cost, inconvenient clinic hours that are incompatible with work hours, and transportation difficulties) are removed, individuals, regardless of race and ethnicity, are eager to proceed with companion-animal sterilization.

The statistical analysis of the PFL data demonstrating that race and ethnicity are not primary factors in utilizing veterinary services is consistent with findings from previous studies that have identified accessibility and affordability as the primary barriers (Poss & Bader, 2007) or potential confounders (Baumann, n.d.; Faver, 2009). Some studies have only looked at race and ethnicity in conjunction with a single or limited range of other factors (e.g., views of pets' roles within the household and/or in a limited number of locations). These studies assume cultural homogeneity across racial, ethnic, geographic, and socioeconomic groups (Baumann, n.d.; Faver, 2009; Hosey & Melfi, 2014; Ortega-Pacheco et al., 2007; Poss & Bader, 2007, 2008; Risley-Curtiss et al., 2006; Schoenfeld-Tacher et al., 2010; Trevejo et al., 2011; Wolf et al., 2008). However, a large degree of cultural heterogeneity has been measured within the many subgroups that comprise the Latino/a

population (Schur, Bernstein, & Berk, 1987). Similar heterogeneity is assumed within the many cultural subgroups within the Black population.

In contrast to previous studies, the size and geographic scope of the PFL data set allowed a broad analysis of the role of race and ethnicity in utilization of veterinary care that captures the cultural diversity of the U.S. population. Although PFL focuses on underserved, low-income communities, the persistence of racial and economic geographic segregation in the United States suggests that findings from the PFL data set are meaningful for Black and Latino/a pet owners across the United States, even if they are not statistically generalizable (Lichter, 2013; Lichter, Parisi, & Taquino, 2012; Reardon & Bischoff, 2011; Williams & Collins, 2001).

Contrary to previous interpretations that ethnicity and race are primary drivers behind willingness to utilize S/N services (Risley-Curtiss, 2006; Schoenfeld-Tacher et al., 2010), PFL's success in engaging residents of all races and ethnicities in veterinary care for their pets suggests that the barriers are structural rather than cultural. Several features of the program support this former assumption. First, a primary selection criterion for PFL sites is that veterinary clinics are not located within the program area. The nearest services are often inaccessible by public transportation due to distance, cost, and ridership restrictions for nonservice animals. The negative impacts of accessibility and transportation barriers to utilizing human health and welfare programs have been well documented in racially and ethnically similar communities (Syed, Gerber, & Sharp, 2013). The PFL program overcomes these barriers by providing transportation services for pets to and from appointments at local participating veterinary clinics.

The second line of evidence that low levels of veterinary care in PFL program sites are due to structural barriers is the engagement generated by eliminating cost for care. The PFL program heavily subsidizes veterinary services such as S/N and vaccinations, making them of no cost to the owner. Although this model is clearly not practical for veterinarians or communities on a wider scale, it illustrates the impacts that affordability of veterinary care can have on dogs and cats living in lower socioeconomic-status communities. Innovative approaches that rely on scaled, clearly defined basic care levels, and appropriate community-based subsidization for veterinary practices serving these clients are needed.

The differences in total utilization of PFL's S/N services, longer ranges in hesitancy to accept vouchers, and the findings of the logistical regression analysis identify some influence of race and ethnicity on utilization rates of veterinary services. This finding might reflect the persistent distrust of the medical community by people of color and a reluctance to engage in services and with institutions that they perceive as having historically perpetuated systemic racism and having promoted inequality, stigma, and oppression (Armstrong, Ravenell, McMurphy, & Prutt, 2007; Corbie-Smith, 1999; Corbie-Smith, Thomas, & St. George, 2002). Although veterinary institutions do not have the same history of ethical misconduct as other scientific research and fields (e.g., the Tuskegee Syphilis Study; Armstrong et al., 2007), veterinary medicine is still commonly identified as a medical profession. Thus, the hesitation to engage with veterinary services is consistent with the same exhibited, documented, and sometimes warranted distrust of marginalized communities of color to engage with medical, public health, and social service providers (Armstrong et al., 2007; Corbie-Smith, 1999; Corbie-Smith et al., 2002; Feagin & Bennefield, 2014; McKenzie & Bhui, 2007; Miller & Garran, 2008; Williams & Mohammed, 2013).

Further, Black and Latina women, particularly Puerto Rican, Dominican, and Mexican American women in the United States and Puerto Rico, were targeted during forced sterilization campaigns from the 1950s to the 1970s, with an estimated 25% of Chicana women in the United States and 35% of all Puerto Rican women coercively sterilized (Davis, 1982; Ross, Brownlee, Diallo, Rodriguez, & Roundtable, 2001). Is the citation Ross, Brownlee, Diallo, Rodriguez, & Roundtable, 2001, linked correctly?> Though specific to animals, the conversations between veterinarians and clients about S/N for the purpose of sterilization may, unknowingly to animal welfare and veterinary professionals, be emotionally charged and highly sensitized for people of color because of the stigma and deep-rooted distrust associated with historical human sterilization campaigns. Another consideration, in

particular for the hesitant Latino/a participants, is the possibility of undocumented worker status for either the participant themselves, a family member, a friend, or a community member, which may result in a distrust of any activity or organization that appears linked to the government in any way.

The study revealed that animals whose owners were White were more likely to be spayed or neutered through PFL services than were animals whose owners were Latino/a or Black. PFL's data constitute a maximum of 5 years in the four original markets and an even shorter and varied amount of time in mentorship markets. It can take years, decades, and beyond to change societal norms that perpetuate unwarranted and potentially damaging stereotypes. As such, it is hypothesized that over time, PFL animals whose owners are Latino/a or Black will have the same S/N rate as animals whose owners are White.

As a retrospective, observational study of an intervention, the independent investigators did not control the research design or data collection, thereby creating limitations. For example, exposure characterization and quantification were limited. Although HSUS uses a rigorous approach to service delivery that includes a detailed treatment manual, comprehensive facilitator training, and facilitator evaluation and feedback, investigators were unable to analyze variables such as first contact type (i.e., door-to-door outreach vs. community event outreach) and number of contacts to consent for those who did not consent on Day 0. The HSUS collected the data for administrative, not research, purposes, resulting in a lack of historical data and rendering bias, confounding, and effect modification difficult to assess.

Conclusion

The successful intervention documented here demonstrates the need for veterinary and animal welfare efforts to establish a presence and build trust and accountability in targeted communities. The cornerstone of PFL's person-centered, community-based approach is cultural competency. Individuals and families living in low socioeconomic-status communities face unique challenges, and educating residents in these communities about animal and public welfare programs requires all professionals and volunteers to be proficient in cultural competency (Kiefer et al., 2013). It is not just the owners who bear responsibility for companion animals in communities with low S/N rates, but rather the pervasive and unfounded assumptions made by service providers that reinforce structural barriers. Given the changing demographics in the United States, culturally competent approaches to clients represent a substantial growth opportunity for veterinary clinics and animal welfare organizations in all socioeconomic environments.

Additionally, subsidized programs such as PFL should not be viewed as fiscal competition, as previous studies have demonstrated a potential positive relationship between low-cost S/N programs and overall community levels of S/N procedures at veterinary clinics (Frank & Carlisle-Frank, 2007). It is likely that low-cost and subsidized programs introduce new social norms around S/N and general veterinary care into communities, which in turn could motivate able community members to seek out S/N services without an economic incentive. Thus, programs such as PFL have the potential to substantially increase the health and welfare of companion animals in historically underserved communities.

Although this study did not identify the primary driver behind low S/N rates and general veterinary care in PFL sites prior to initiation of the subsidized programs, race and ethnicity did not appear to be a driver. Future studies will need to address other potential drivers, including the hypothesized systemic and structural barriers posited. Studies exploring potential S/N predictors such as accessibility; potential mistrust of veterinary and animal welfare service providers; and the nature, perceptions, and perpetuations of structural barriers are essential to improving veterinary practice and companion-animal welfare in the United States.

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