Exploring the Perceptions of Local Citizens towards the Hangzhou Trap-Neuter-Release (TNR) Program and its Outcomes

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Executive Summary

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This paper highlights the issue of a large number of stray cats in China and emphasizes the need for proper intervention to prevent further problems. The Trap-Neuter-Return (TNR) program policy has been implemented in many countries to control the overpopulation of stray cats, which has proven to be effective. However, in China, the TNR program has only been implemented in a few mega-cities such as Beijing, Shanghai, Shenzhen, and others. The purpose of this paper is to investigate the perspectives of local citizens on the Hangzhou TNR program, including its necessity and results. To achieve this, surveys and qualitative interviews were conducted to capture the viewpoints of both supporters and opponents of the program. The research collected information from a diverse group of citizens to gain a comprehensive understanding of public attitudes towards the TNR program for the stray cat community. Surveys are particularly valuable in providing insights into public perceptions and support for the program. They can reveal people's knowledge and experiences with stray cats, their assessment of the effectiveness of the TNR program, their level of support for the program, and their recommendations for improving it. Interviews were also conducted with local animal protection non-governmental organizations (NGOs), hospital directors, and relevant businesspersons to gain insight into their knowledge of the TNR program. Additionally, a survey was conducted to gather data on local citizens' perceptions and attitudes toward stray cats and the TNR program. The collected data were analyzed to evaluate the effectiveness of the TNR program in reducing the number of stray cats in Hangzhou, China, while considering and improving the current dilemma.

Key findings of the study include:

1. Feedback from 1265 survey respondents revealed that most people treat stray cats in a friendly or benevolent and believe that their numbers need to be controlled and taken care of. However, public institutions lack a sense of urgency in addressing this growing problem.
2. Currently, the Hangzhou TNR program in small scale and low visibility, only limited to pet owners, and there is a need for education and awareness campaigns to promote
3. The lack of communication with the public and limited impact of the program on the number of stray cats has led to this perception. Nevertheless, most people believe that the TNR program has reduced the number of stray cats in their area.

4. The TNR program faces some challenges, including insufficient funding, a shortage of labor, challenges and follow-up issues during the program, adoption after release, and a lack of standardized measurement criteria.

Key recommendations include:

1. Provide more support for TNR programs, including funding for spay and neuter surgeries, veterinary care, and outreach efforts. Policymakers should allocate more resources to TNR programs and provide legal protections for TNR programs and caregivers.

2. TNR pet welfare organizations should focus on public education and participation to increase awareness and understanding of TNR programs. They should offer training and support for volunteer caregivers.

3. TNR pet welfare organizations should improve their approach to TNR by continually evaluating and making adjustments as needed to ensure that they are achieving their goals.

4. Develop partnerships between TNR organizations and local animal shelters to increase the effectiveness of TNR programs and to save resources.

5. Increase community outreach and engagement by developing targeted outreach efforts that are culturally appropriate and that address specific concerns or barriers to participation.

6. Develop standardized metrics to measure the success of TNR programs, including measures such as the number of cats sterilized, the number of new kittens born, and the reduction in complaints related to stray cats.

Approved

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1. Introduction

Stray cats have been a longstanding issue in many parts of the world, and their populations continue to grow in many urban and rural areas. These cats are often the result of abandonment by their owners, or they may have been born to other stray cats. Without proper care and attention, they are left to fend for themselves, and their populations can quickly spiral out of control. China is one of the countries grappling with this issue. The presence of stray cats on the streets of China has led to a substantial and detrimental impact on the native animal population, with estimates suggesting that cats are responsible for the deaths of billions of birds and animals each year.

To address this issue, many cities have implemented Trap-Neuter-Return (TNR) programs, which involve trapping stray cats, neutering them, and returning them to their original habitat. Some cities in China are implemented TNR in various communities across the city. The program is designed to reduce the birth rate of stray cats, reduce the spread of diseases, improve animal welfare, and balance the ecological effect. The TNR program works with local veterinarians to provide low-cost spaying and neutering services, and also to promote in animal protection organizations (Fang et al., 2014).

This paper aims to explore the views of local citizens on the Hangzhou TNR program its necessity and its results. Therefore, a survey and qualitative interviews were used to study the views of supporters and opponents of the program, involving the collection of information from a range of local citizens. In the TNR program for the stray cat community, surveys can provide valuable insights into public perceptions and support for the program. They can reveal people's knowledge and experience of stray cats, their perception of the effectiveness of the TNR program, their level of support for the TNR program, and their suggestions for improvement.

The information can be used to adjust the policies of the TNR program to better meet the needs and preferences of the public, increase community participation and support, and ultimately improve the effectiveness of the program. At the same time, by collecting people's opinions through the survey, the policymakers of the TNR program can also identify potential barriers to the successful implementation of the TNR and develop targeted strategies to overcome them. Additionally, the survey can provide a basis for assessing the success of the TNR program over time and making adjustments as needed. The results of this study will provide valuable insights that can be used as a reference for TNR programs in other regions with similar stray cat problems.
1.1 Background

What causes pet cats to become stray cats? China is among the nations struggling with the problem of stray cats. According to China Pet Industry White Paper 2021, China had over 53 million stray cats in general. Meanwhile, according to Tan et al. (2017), stray domestic cats have been responsible for killing billions of birds and animals globally, negatively affecting the native animal population.

Additionally, the pet industry is still developing in China in a regulatory vacuum. The lack of proper regulation and animal welfare standards in the pet industry in China leads to sub-standard conditions for many animals (Yu, 2023). Additionally, it means that few animal welfare standards are in place and many kittens are born just to be abandoned or left to die. While several initiatives have been implemented in various cities and regions to control the population of stray cats through spaying and neutering, these strategies have not been entirely successful (Tali Aronsky, 2022).

The general public can help alleviate the detrimental effects of stray cats by ensuring that their domestic cats are spayed or neutered to prevent reproduction. Cats can also be contained indoors or in outdoor enclosures to prevent them from escaping or preying on local wildlife. Taking in stray cats and providing them with a permanent home is also a helpful solution.

1.2 Problem impact of stray cats

1.2.1 Nuisance

The overpopulation of stray cats in China has prompted several nuisance complaints among members of the public. Free-ranging cats are attracted to excess food accumulated in bins or empty food containers. This often leads to a congregation of free-ranging cats engaging in yowling and spraying hence making the surrounding environment uninhabitable (Ireland & Neilan, 2016).

1.2.2 Disease transmission

Stray cats are also considered detrimental to the environment because they spread diseases. This has made the overpopulation of stray cats in China a public health concern. Some of these cats in China have been found to spread zoonotic diseases such as toxoplasmosis, rabies, and cutaneous larval migrans since they harbor numerous plagues and
nematode parasites (Halim et al, 2021). Therefore, adding vaccination to the TNR program may have significant public health benefits.

1.2.3 Animal welfare

Having overpopulated stray cats in the cities not only poses health problems to humans, but also raises concern for their own wellness. Compared to pet cats, stray cats have a much shorter life span. The older they get abandoned; the death rate becomes higher. Newly abandoned cats lack the ability to find food, and they can easily get sick from the cold weather in winter and the rain in summer. And if one of them has the cat plague, then it may cause plethora number of deaths in the population. Aside from these, rat poison, car accidents, and torture are also threats that largely affect stray cats’ welfare (CAWA, 2007). In addition, the lack of specific animal welfare laws in China has led to several problems, such as the widespread practice of dog and cat eating and the sale of sick and injured animals in pet shops. There have been several high-profile cases of animal abuse which also caused attention.

1.2.4 Ecological effect

Lastly, stray cats have been found to cause ecological imbalance. The overpopulation of free-ranging cats in China is causing a disruption of the natural balance of the ecosystem. Cats are known for preying on birds and small mammals which may lead to the collapse of the food chain and eventually cause ecological imbalance (Hoffman, 2015). Therefore, to avoid the consequences of unbalanced ecosystems there is a need to control the population of stray cats in China.

Figure: Logic model of overpopulation of stray cats
1.3 Trap-Neuter-Return (TNR) program policy

The TNR program involves capturing, sterilizing, and returning stray cats to where they were first found. During the trap-neuter-return process, also known as TNR, stray cats are captured using humane box traps. They are spayed or neutered and – in many programs – also vaccinated before being released back into their original territory. As part of the Trap-Neuter-Return Program, treated cats have their ears "tipped" to indicate that they have been spayed or neutered and vaccinated.

1.3.1 TNR policy in worldwide

According to Wolf (2019), TNR is practiced in more than 30 countries worldwide, including United Status, Australia, Italy, Japan and so forth. TNR has been gaining popularity in western countries, with many communities passing policies supporting TNR and several organizations dedicated to promoting and implementing TNR programs. Meanwhile, in the practices, the TNR programs are the largest providers of rabies vaccinations (Alley Cat Allies, 2023).

The first recorded instance of TNR being used to manage a stray cat colony occurred in Great Britain in the early 1970s. A woman named Rosemary Woodhouse began trapping stray cats in her neighborhood, having them spayed or neutered, and then releasing them back into the community.

1.3.2 TNR policy in China

Despite the rising problems caused by stray cats, there is no specific national law in China addressing and protecting them. The most relevant national law about stray cats is the Law on Animal Epidemic Prevention, which only allows capturing and killing of stray pets if they catch infectious diseases or an epidemic breaks out (Wang & Liu, 2021). There is no mention of problems such as nuisance and ecological imbalance. Although the law was amended in 2021 in response to the growing stray pet problem, most of the amendments are related to dogs.

In China, the TNR program is only popular in recent years, and only few mega-cities involved in such as Beijing, Shanghai and Hangzhou have provided TNR programs with free neutering services in response to the cat problem. Usually, these management strategies for stray cats still depend on cities or local communities. The management actions are often carried out by citizens instead of the government, even though the new amendments to the Law on Animal Epidemic Prevention have provided some support for local communities. One
of the main ways is by helping to prevent the spread of diseases among animals. Also, by implementing measures such as monitoring and testing animals for diseases, enforcing quarantine and isolation procedures, and regulating the transportation and sale of animals, these laws can help to prevent the spread of zoonotic diseases in local communities. However, the involvement of the government is still needed because civilian organizations often lack resources (Wang & Liu, 2021).

1.4 Benefits of Trap-Neuter-Return (TNR) program

1.4.1 Reduced population growth

By spaying and neutering stray cats, TNR programs help to reduce the number of cats that are able to reproduce, which can significantly decrease the number of stray cat populations (Spehar & Wolf, 2019). Several studies conducted in different countries such as the USA and Italy have shown that implementing TNR in a specific area can effectively reduce the population of cats over a period of time. For example, Levy et al. demonstrated the success of TNR in reducing the population of stray cats on a university campus in Florida, where the number of cats decreased from 155 to 23 over an 11-year period. Similarly, the TNR program was implemented in a stray cat colony in Rome and resulted in a decrease in the number of cats in the colony between 16% and 32% over a 10-year period (Alley Cat Allies, 2017). Spehar and Wolf published a paper describing a TNR program carried out in Massachusetts, which effectively reduced the number of stray cats from about 300 to none over a 17-year period. In another paper, they also reported a decrease in cat population in a specific area in Chicago managed by a neighborhood TNR program for 10 years.

1.4.2 Reduced nuisance behaviors

Stray cats that are spayed or neutered are less likely to engage in nuisance behaviors such as yowling, spraying, and fighting, which can make them less of a nuisance to the people who live near them. One study found TNR reduced nuisance behaviors by 61% (Alley Cat Rescue, 2023).

1.4.3 Improved health

TNR programs often include vaccination and medical treatment for stray cats, which can help to improve their overall health and reduce the spread of disease (Spehar & Wolf, 2019).
1.4.4 Adoption

Studies have demonstrated that adoption rates for TNR programs in the United States ranged between 18% to 80% (Hostetler et al., 2020). According to statistics provided by TNR Utopia (2019), the number of adoptions in New York was approximately 32% in 2018, which increased to 57% in 2019. Levy's research on a university campus TNR program between 2002 and 2019 included 204 stray cats, of which 92 (45%) were adopted. The study also revealed that socialized adult cats were adopted more quickly after being captured and neutered, compared to stray adult cats. Additionally, the data indicated that 65% of the stray cats adopted were kittens rather than adults (Spehar & Wolf, 2019). Based on findings, the author suggested that the benefits of TNR could be optimized by including methods to reduce abandonment, such as adoption (Natalie Stilwell, 2020).

1.4.5 Reduced predation on wildlife

By reducing the number of stray cats in an area, TNR programs can help to reduce the number of animals that are killed by cats each year, which can help to protect local wildlife populations (The Humane Society of the United States, 2023). This is one of major benefits of the TNR.

1.4.6 Reduced euthanasia

TNR programs can help to reduce the number of cats that are euthanized in shelters each year, as fewer stray cats will be brought to shelters (Havahart, 2023).

Overall, TNR programs can be an effective way to manage stray cat populations and reduce their impact on local wildlife and communities. By spaying and neutering stray cats, providing them with medical care, and returning them to their original location, TNR programs can help to improve the lives of cats and the environment in which they live.

1.5 Rationale of Selecting Hangzhou as study area

Why focus on Hangzhou, China? According to incomplete statistics, there are about 300,000 stray cats in Hangzhou (LT, 2014). Due to the high reproductive capacity of cats, this number will reach millions in a few years without intervention. At the same time, the stray cats now attract a lot of problems, and the public has different attitudes towards stray cats, causing conflicts to intensify causing social attention (Fang et al., 2014). In order to effectively control the number of stray cats and avoid further dispute in communities, Hangzhou has launched this TNR program as a pilot city in China.
1.5.1 Timeline of TNR program in Hangzhou

Since 2011, TNR has been piloted in some communities in Hangzhou. In November 2011, the Provincial Small Animal Protection Association chose the Qizhen Community as a pilot and signed the Community TNR Program Cooperation Agreement with the community property. After training, stray cats were captured by volunteers and scheduled feeders, and the catch cage was the equipment, then sent in batches to the animal hospital for medical examination, neutering, vaccination and deworming, while ear clipping was used as a neutering mark.

Following the release of the first batch, measures were taken to set up an outdoor cattery, establish a centralized feeding area, and create a file for stray cats that had been spayed or neutered to ensure ongoing monitoring and rescue efforts. During the return visit, 18 of the nearly 30 stray cats in the original community were neutered, meeting the program requirements. More than 80% of the owners gave their approval.

However, the provincial Small Animal Protection Association is a private organization with a relatively loose organizational structure and staff composition, and the primary challenge to promote the TNR program is funding (LT, 2014; Fang et al., 2014). The cost is undoubtedly a huge amount, and it is obviously impracticable to rely purely on public welfare or private organizations to cover the payment.

Therefore, The Hangzhou Animal Husbandry Bureau, on behalf of the Hangzhou government, invested 300,000 RMB as a stray cat neutering fund in creating a TNR pilot program to conduct in some communities.

There are two specific ways of implementation: First, the stray cats are caught in the community by trapping and sent to the animal hospital for a unified spay/neuter operation, along with deworming the stray cats, and then sent back to the community. Second, residents who find a stray cat and want to send it for neutering are allowed to go to the community to prove the cat's identity and then send it to the designated animal hospital for free neutering surgery (Fang et al., 2014).

1.5.2 Current Stage of TNR program in Hangzhou

A number of animal hospitals participated in the TNR program bidding, with seven veterinary hospitals in Hangzhou currently providing free neutering for stray cats. The TNR program for hospitals is implemented by the municipal veterinary authorities. Also, many individuals, communities, and local animal protection organizations are actively engaged in
neutering efforts. According to the interviewee from one of the veterinary hospital, around 50-100 cats can be neutered in each hospital per month, resulting in approximately 600 to 1500 stray cats being spayed or neutered each year. Ultimately, the seven cooperate hospitals can neutralize 4,000 to 10,000 stray cats per year. Meanwhile, the interviewee mentioned that the adoption rate is only 10-15%, despite receiving thousands of stray cats each year. As a result, many of the captured cats are released back into the communities, while only a select few are adopted. It is worth noting that this is a very small number compared to the estimated 300,000 free-ranging cats in Hangzhou, and this number is expected to grow in the future. Therefore, the TNR program needs to be continuously implemented and the need to expand efforts.

1.5.3 The dilemma of adoption in Hangzhou

According to the 2018 China Pet Industry White Paper, pet cats are mainly purchased or picked up in pet stores. Adoption has a low percentage. Part of the reason may be due to the complex adoption steps and privacy leakage. Adoptions require personal information and identity documents, and follow-up visits, which makes some adopters feel their privacy is violated. At the same time, the basic requirements for adoption include: screened windows, no open balconies, regular work and residence for the adopter, unanimous consent of the family, commitment of no abandonment, regular vaccinations, spaying and neutering when the time comes, and timely medical attention for any problems. Many people who want to adopt feel that the requirements are too strict (Soho, 2019). However, when people buy pets at the store, these requirements above are not necessary or relatively simple.

1.6 Objective and Approach

The effectiveness of TNR projects in reducing the population of stray cats in Hangzhou, China, may depend on several factors, such as the specific location and conditions of the TNR project, the number of cats sterilized, the number of new cats introduced to the area, and the overall health and reproductive status of the cat population. The need to implement and manage the TNR program policy with local people entails three key questions:

Q1: What the local residents perception of the existing number of stray cats in their communities
Q2: What do people know about, and what is their degree of support for TNR programs?

Q3: What shortcomings or challenges exist in the current implementation of the TNR program that need to be overcome to improve its effectiveness or to scale it up?

Since cats allowed to roam free typically reside in harsh environments, concerns regarding their well-being have been raised. As a result, finding a solution to the overpopulation problem among stray cats in China is of utmost importance (Zhang et al., 2021; Schmidt et al., 2009). Standards for governing cats allowed to roam free might vary widely from one city to the next, leading to confusion and mayhem (Zhang, 2020; Spehar & Wolf, 2019). As a result, the research will collect public opinion to evaluate the TNR program's current policy in Hangzhou and the local problems it faces.

2. Methodology

2.1 Research Approach

A survey and interviews with people working in this field. The word frequency analysis method also be used in analysis part. It is a method for evaluating the significance of words in a piece of text or a collection of texts. It achieves this by quantifying the frequency with which particular words appear.

2.2 Data Collection

The questionnaires were distributed to residents who were over 18 years old and had lived in Hangzhou for at least one year. The study created questionnaire by WJX.cn online survey company, which had been approved by the Institutional Review Board of Duke University. The survey consisted of 34 questions, including basic personal information about the respondents, their views and positions on local stray cats. Before being fully distributed online, the questionnaire was piloted with five testers, and all participants in the pilot test were interviewed to confirm that there were no issues with misunderstanding the questions or the information requested. The aim was to collect 1200 questionnaire responses, which represented an existing percentage of the population in Hangzhou. The final valid data included 1265 responses, mainly from individuals aged 18-39. Around 40% of the survey population were employees of enterprises and institutions, followed by professionals and technicians, as well as students and freelancers.
For the interview, there were 13 organizations identified, 7 organizations were contacted, and eventually, 3 people accepted our interview request. This includes a leader of the animal protection organization, people works in local veterinary hospital, and a worker from a pet food enterprise.

- Mr. Zhu is the leader of the animal protection organization in Zhejiang Province. The goals of their NGO were life care education, animal rescue and adoption, scientific and civilized pet ownership, issuing against cruelty and abuse, industry self-regulation and management, and promoting animal welfare.

- Ms. Zuo is currently working at the local veterinary hospital, which had rescued many stray cats and dogs. Her hospital was also available for animal adoption, and she has cooperated with many NGOs and companies.

- Mr. Yuan is a pet enterprise worker. The company had supported several charity activities, understood and supported the TNR program, raised funds, and was willing to help more stray cats complete neutering.

Each interview took between thirty minutes and one hour with the several leaders of local non-profit organizations for stray cat protection, the local pet hospital, and the related business company. The analysis in the report was grouped by theme and coded by theme under each topic.

3. Analysis

3.1 Background Analysis of Hangzhou residents

Within the 1265 answers that were collected, 1032 respondents currently own or had owned pets in the past, while 253 respondents indicated a desire to own pets in the future. Only 202 respondents reported never having owned a pet before. Since those who currently own or had owned pets in the past may hold biased views on the preferences of stray cats and the effectiveness of TNR policies, it is necessary to conduct a separate analysis for this group compared to those who have never owned pets.
When asked 425 cat owners about their sources of obtaining cats, 195 said they bought them from pet stores. Another 92 were given by friends, and 48 said they picked up cats on the street. For adoptions, 50 people adopted from online or ground platforms, 31 people chose to adopt from cats abandoned by veterinary hospitals, and only 8 people adopted from animal protection organizations. This confirms the phenomenon that adoption is only a minor way to raise pets in China.

Upon conducting a more in-depth analysis of the data, it was discovered that the primary reason why many individuals chose to purchase cats or receive cats from friends rather than adopt them was mainly due to their concern about stray animals wandering outside and potentially carrying diseases, with a proportion of 71.94%. Following that, there were 31.29% of people thought the procedure of adoption were too complicated or worried about have no time to take care of them.

This finding underscores the importance of raising awareness about the benefits of adopting pets from shelters or rescue organizations, and implementing measures to reduce the risk of disease transmission from stray cats.
Out of the 425 people who have owned or currently own a cat, 294 (69.18%) had their cats neutered. This proportion is similar to developed countries cities in the United States and Europe, where the percentage of neutered stray cats can be as high as 70% or more (Gunther et al., 2021).

A word frequency analysis of a survey conducted among cat breeders examined their attitudes towards neutering cats. The analysis revealed that 48 respondents were concerned about reducing the nuisance caused by yowling during the rutting period. Additionally, some cat owners believe that neutering their cats can reduce the risk of diseases, resulting in better health and safety for stray cats. Neutering is also a better option for cats. However, 43 individuals were concerned about breeding offspring and were unable to afford to feed kittens. 29 participants also shared the view that neutering their cats made breeding easier. Moreover, 24 people believed that neutering their cats can increase their lifespan.
Figure 3.1: Word frequency on reasons the owner neutered their cats

Figure 3.2: Word frequency on reasons the owner have not yet neutered their cats

However, the remaining 130 (30.66%) did not neuter their cats, and some reasons were listed by checking word frequency tool. The top reason was 25 of them personally
preferred to have kittens and believed it was their right to have kittens, and another 20 people did not want their cats to have neuter surgery. 19 of respondents had a separate reason because these people were not necessarily opposed to neutering, and they were just waiting for the right time. Similarly, there was a group of people who stated that they were too busy with work to consider neutering at the time. Few people also mentioned the cost as a reason not to neuter their cats. According to the interview by Ms.Zuo, the cost of neutering for female cats is 480 RMB, while male cats are relatively cheap with a cost of 380 RMB. Some of respondent mentioned that they could not afford the cost of neutering.

There are many factors that influence why people may choose not to neuter their cats, including personal circumstances, beliefs, and values. However, to effectively address the stray cat problem in Hangzhou, it is crucial to educate cat owners about the benefits of neutering. This education should emphasize how neutering can reduce the risk of certain health and behavioural nuisances. Additionally, it is important to address any concerns or misconceptions that pet owners may have about the procedure. One effective approach to increase participation in neutering programs would be to provide free neutering services to those who are unable to afford it or are too busy to participate. By implementing these measures, we can help reduce the potential for cat abandonment and the increase of stray cats in the city.

### 3.2 Analysis the perception of stray cats from Hangzhou citizen

*Figure 4: Perception of respondents of the size of the stray cats population in their surroundings*

When to further investigated the analysis of the number of stray cats in the surrounding environment by those who have or had a pet against those who have never had a
pet, it was found that those who had or have a pet considered the number of stray cats to be on the larger scale. However, people who have never had a pet considered the number of stray cats in the surrounding area where Hangzhou lives to be small. The survey showed that all groups believe that stray cats have little impact on the surrounding life and do not perceive it as a significant problem. In all groups, the most important impact is the concern of carrying disease and bacteria. This shows a lack of knowledge about stray cats’ environmental impact, and especially their predation of urban wildlife, which relates to the lack of knowledge about urban wildlife and biodiversity.

Meanwhile, the survey found that when people who had owned pets or had pet were more willing to choose to feed stray cats or call the cat rescue center or the relevant department for them to handle them properly. For people who have never had a pet before, the more common choice was to ignore it. This showed that the vast majority of people's attitude towards stray cats is friendly or at least benevolent.

*Figure 5: Whether stray cats need help and/or need to control the number or not*

At the same time, it was noted that when it concerned stray cats, the majority of the respondents believed that stray cats needed to be rescued and the number needed to be controlled. However, this number was relatively lower among those who are or have been keeping other pets. In fact, a majority participants who are having or previous had other pets thought that stray cats need help but do not need to control the number of stray cats.

In summary, the analysis of the perception of stray cats among Hangzhou citizens showed that people who have or had pets considered the number of stray cats to be on a
larger scale than those who have never had pets. Nevertheless, all groups perceived stray cats as having a limited impact on their daily life, and their main concern was related to potential health risks. Education may be necessary to address the lack of knowledge regarding the environmental impact of stray cats. Overall, people's attitude towards stray cats was mostly friendly with a proportion of 56.6%, with pet owners being more willing to feed or seek help for stray cats. This perhaps explains the lack of urgency from public authorities in addressing this growing problem. However, people who have or have had pets are more likely to take action to help stray cats, while the majority believe that stray cats need rescuing and population control.

3.3 Analysis of Hangzhou citizens' position on the TNR policy for stray cats

According to the following figures, it was found that people who have kept or are keeping pets had a higher awareness rate of knowing the TNR program being implemented in Hangzhou which around 54% to 58%, and there were also a great percentage respondent heard this program, but not familiar. While people who want to keep pets and those who have never kept pets are more likely to have not heard of it or not know about it at all. This indicates that the current understanding of the TNR program is still limited to those who have pets, and other people who do not keep pets need to be educated and promoted to understand the TNR program and accept the program when they have pets in the future.

Figure 6: Whether people are aware of the TNR Program in Hangzhou to neuter stray cats

After analyzing the survey, it was found that 268 out of 294 cat owners (around 91.16%) who had already neutered their cats also supported the TNR policy. However, there were still 18 who were opposed and 8 who expressed indifference to the TNR policy. Among
those who neutered their cats and supported TNR to neuter stray cats, they believed that the three most important reasons for supporting the TNR policy for stray cats were that it could improve the quality of life of residents (72.39%), reduce the emotional instability caused by non-neutered cats (71.64%), and decrease survival pressure and have benefits for cat health (64.18%). The survey revealed that only 18.28% of respondents mentioned the reduction of prey for other animals, indicating a lack of awareness regarding the impact of stray cats on wildlife.

*Figure 7.1: Reasons why people who had already neutered their cats support the TNR program*

![Figure 7.1: Reasons why people who had already neutered their cats support the TNR program](image)

*Figure 7.2: Reasons why people who have not neutered their cats support the TNR program*
Although the number was relatively smaller, those owners who had not neutered their cats also held a supportive attitude toward the TNR policy. However, their opposition and indifferent attitudes had increased. Upon analyzing the attitude of a total of 130 owners who had not neutered their cats towards the TNR program for stray cats, we found that 108 (83%) of them supported the TNR policy, while 13 opposed it, and 9 were not interested. The main reasons for their support were the same as above, with the main reason being to benefit cat health, followed by reducing the emotional instability caused by rutting and improving the quality of life. It was evident that they had similar opinions to those owners who had already neutered their cats. Another possible explanation for why cat owners who had not neutered their own cats may have supported the TNR program was that they recognized the negative consequences of uncontrolled cat populations, such as the spread of diseases and the negative impact on the local ecosystem. They may have also understood that TNR was a humane approach to managing stray cat populations, as it avoided the need for euthanasia and reduced the likelihood of cats being killed in shelters. Additionally, they may have felt that TNR was an effective way to address the issue of stray cats and improve the welfare of these animals.
On the other hand, 16 people who had neutered their own cats objected to the TNR (Trap-Neuter-Return) program for various reasons. There were 68.75% of cat owners were primarily concerned about the risks of surgery such as post-operative infection, while 43.75% cat owner mentioned about the cats’ right to mate, as well as same percentage people thought the cost and difficulty of controlling the large population of stray cats in Hangzhou. Furthermore, a similar proportion of participants expressed concerns that it contained a violation of cat’s right and it might have a better solution instead of promoting TNR program.

This finding may seem contradictory because it shows that some cat owners who have neutered their own cats do not support the TNR program, which is aimed at controlling the population of stray cats in a humane way. However, it is important to note that each cat owner's decision to neuter their own cat is based on their personal circumstances and beliefs, while their stance on the TNR program may be influenced by a range of factors such as their understanding of the issue, their experience with stray cats, and their beliefs about animal rights. Overall, this finding highlights the complexity of the issue of stray cat populations and the various factors that can influence an individual's stance on the TNR program. While some cat owners may have neutered their own cats, they may have different beliefs and concerns when it comes to the TNR program, and their decisions may be influenced by their personal experiences and values.
Evidently, the 11 owners who opposed the TNR program also shared the same concerns as those who had already neutered their cats regarding the surgery and the cat’s right to free love and reproduction, accounting for 54.55% and 45.45%, respectively. The third reason was violation of stray cat’s rights. It refers to the ethical or moral entitlements that are believed to be inherent to all living beings, including stray cats. These rights may include the right to life, freedom from harm or cruelty, and the right to live in a natural environment.

This indicates that people had similar ideas about both supporting and opposing the TNR program, regardless of whether they had already neutered their cats or not. Therefore, promoting the surgical technique and popularizing its safety is one way to alleviate people's worries and encourage them to choose to have their cats neutered.
Out of the 202 people who did not own pets, 139 individuals supported the TNR program, representing 66.91%. This percentage is higher than pet owner who have not neutered their own cats (59.26%), but slightly lower than pet owner who neutered their cats (72.39%). Their main reasons for support were improving residents’ quality of life, reducing midnight howling and emotional irritability due to mating, and reducing survival pressure on stray cats, accounting for 66.91% and 66.19%, respectively. The third reason, which accounted for 64.03%, was to benefit cat health and reduce reproductive disease prevalence.
On the other hand, 17 respondents opposed the TNR program. Among them, 47.06% believed that the TNR program violates the rights of stray cats or that there is a better solution for stray cats. Others expressed concern that neutering surgery might harm the body of cats, accounting for 35.29%. Based on the given data, it can be inferred that a significant majority of people who do not own pets support TNR (trap-neuter-return) programs for managing stray cats.

Figure 8: The current situation of stray cats in Hangzhou has been well managed or not
According to the survey, people living in Hangzhou were not quite satisfied with the management of stray cats through the TNR program generally. Only 47.29% of those who have had cats in the past or currently have cats believed that stray cats in Hangzhou were well managed. The percentage was less than half. Then, 21.65% of the respondents did not believe that stray cats were well managed. Among the cat-owning population, 31.06% did not have a definitive opinion on the matter. This can be interpreted both as reflecting the current relatively small scale and low profile of the TNR initiative in Hangzhou, as well as a lack of visibility and communication to the public regarding the TNR’s impact on Hangzhou's stray cat situation.

The percentage of individuals who believed in good management gradually decreased for those who had other pets or did not have pets. For people never have pet before, only 7.43% believed that stray cats were well managed, and 70.30% of majority people had no idea whether Hangzhou managed stray cats well or had insufficient information on the topic. This indicates that one's perception of the present circumstance may be influenced by personal experience with cats.

*Figure 9: Respondents’ perception of whether or not TNR program has reduced the number of stray cats in the neighbourhood*

Overall, it appeared that nearly 90 percent of respondents who had or previously had pets believed that the TNR program had reduced the number of stray cats in the neighborhood. However, this percentage decreased for people who did not have pets, and the chart showed that only 64.36% of participants believed that the TNR program had reduced
the number of stray cats. This further indicates that pet ownership may affect the perception of the effectiveness of the TNR program in controlling stray cat populations.

Figure 10: Difficulties encountered in implementing the TNR program in Hangzhou

All participants in the survey questionnaire mentioned the difficulties they faced in implementing the TNR program. Of the population, 62.53% emphasized that the main difficulty was the high cost of implementation and the low funding of the program. This was also the same response given by the interviewed people. Additionally, 51.46% of the respondents expressed concerns about the implementation process, stating that the TNR procedure might be too complicated and that tracking and adopting cats after release needed to be carefully considered (50.43%).

Another challenge mentioned by 40.32% of the respondents was the potential pressure from social opinion for the TNR implementation. They were referring to the possibility that they might face criticism or disapproval from other members of society for supporting the TNR program. This could have been due to a range of reasons, such as cultural or religious beliefs, personal values, or a lack of understanding or awareness about the TNR program and its benefits.

In some communities, there may have been a negative perception of stray cats, and some people might have viewed them as a nuisance or a health hazard. This could have led to
social pressure against the TNR program, as some might have seen it as "encouraging" or "tolerating" the presence of stray cats. Additionally, some people might have had misconceptions about the TNR program and might not have understood its benefits in terms of controlling the population of stray cats in a humane way.

Therefore, the potential pressure from social opinion could have been seen as a challenge for implementing the TNR program, as it could have limited the support and participation of individuals who were concerned about how others might perceive their involvement in the program. It highlighted the need for education and awareness-raising efforts to address misconceptions and promote the benefits of the TNR program, as well as the importance of building a supportive and understanding community to encourage its implementation.

4. Discussion

TNR programs are becoming increasingly popular as a human method of controlling the stray cat population. The survey (figure 9) shows that local people believed that the program had received a good step in reducing the number of stray cats in the city while addressing residents' concerns. However, it is indeed to educate the public about the benefits of the TNR program and address any concerns or misconceptions about the TNR program.

The analysis revealed the residents’ stance regarding the initiative. According to the survey and interview, the majority of local people supported the TNR program no matter they have pets or not (figure 7.1, 7.2 &7.5). Their reasons for support included enhancing residents' quality of life, reducing mental instability caused by neutering, and lowering survival pressure, which helps cats.

At the same time, for cat owners who have neutered their cats or not oppose TNR program (figure 7.3 & 7.4), the main concern came from the danger of the surgery itself, followed by the consideration of the cats' right to free love and reproduction. However, the difference is that the people who own cats were concerned about the number of stray cats, which may lead to the difficulty and cost of the TNR implementation. For those who do not have pets (figure 7.5), the main reason for opposing the TNR was mainly considering the rights of cats and that there might be a better solution.
5. Challenges

5.1 Insufficient funding

One of the most mentioned is the lack of funding. The government's support for the TNR program is insufficient. Ms. Zuo mentioned that during her interview, the TNR program was primarily funded by the private sector, with the government providing only 20 free spay/neuter slots per month were available at each hospital and were obtained by applying to the vet hospital. Of the program's funding, she considered that 80% of funding came from individuals, 15% from IT Foundation with an amount of 50,000 RMB per year, and only 5% of funding from the government. IT Foundation is the first public welfare foundation dedicated to animal protection in China. It was established in May 2011 by a number of famous media people, charity foundations and Tencent Charity Foundation. Rescuers can apply directly with IT Foundation, while the foundation has cooperation with hospitals. Also, the foundation will give support in food and over-winter items. Although the TNR program is facilitated by the Hangzhou Municipal Government, if the funds are insufficient, the specific actions and details are difficult to implement and will inevitably fall into a challenge. The shortage of manpower is also a challenge for the TNR implementation.

5.2 Shortage of labour

The free TNR program for each hospital in Hangzhou is 20 cats per month, and there are only 7 hospitals in total, which is far from enough. Furthermore, community involvement in the process was minimal. The success of the TNR initiative is also dependent on neighborhood participation. Trapping is the primary part of the TNR program, and if trapping fails, the preparation cannot continue. It is known that cats are flexible and agile animals, which are extremely difficult to catch. The trapping workload required for stray cats is huge, and there is a considerable demand for manpower. The community must be informed of, supported, and willing to engage in the initiative. However, group participation has been difficult. During the interviewed, they mentioned some community members were ignorant of the initiative, while others oppose it (Fang et al., 2014). Concerns about the surgery's safety and the cats' right to unfettered love and breeding drive the resistance.

5.3 Process of the program and subsequent issues

Although the TNR program has only three parts, each of them involves many important steps, and a problem in any one step can affect the entire process. When stray cats
are released after neutering, there is little change in the number of stray cats in a short period of time (except for the effect of purring during the rutting period), and the actual impact is a long-term process, which is difficult and slow to implement. Therefore, the survival and behavioral status of stray cats after neutering must be taken into consideration.

5.4 Adoption problem after release

During the survey, follow-up after release was identified as a significant challenge in implementing the TNR program. Ms. Zuo, in particular, highlighted that while thousands of cats are neutered each year, only 10% of them are adopted. The majority of these cats are captured and released, leaving cats close to people in need of adoption. While TNR programs focus on trapping, neutering, and release, the follow-up work after release, including adoption, is critical for their success. Without proper attention and care after release, the implementation of the program will still face significant hurdles.

5.5 Lack standardized metrics

In addition, lack standardized metrics is the inability to measure their effectiveness consistently and objectively. Without a common set of metrics to evaluate TNR programs, it is difficult to compare their impact across different regions or organizations. This lack of standardization makes it challenging to assess the effectiveness of different TNR programs and make informed decisions about program design or implementation. Moreover, the absence of standardized metrics can hinder the ability of TNR organizations to secure funding, as donors and policymakers may have difficulty assessing the impact of TNR programs. Therefore, developing standardized metrics is crucial for the success of TNR programs, as they provide a standardized approach to measure the impact of these programs and enable organizations to make data-driven decisions.

6. Recommendations:

Based on the analysis, I would like to make the following recommendations:

1. Provide more support for TNR programs: TNR program has been shown to be an effective way to control the population of stray cats. Policymakers should allocate more resources to TNR programs, including funding for spay and neuter surgeries, veterinary care, and outreach efforts. In the United States, funds for the TNR program come from several sources, such as personal donations, local fundraising events, online donations, cooperative pet hospitals, donations from protection organizations, and state funds (Alley Cat Allies,
2023). This is a public issue that should be participated and solved by every citizen. According to Ms. Yuan, he said that the Hangzhou TNR program is long-term and does not easily produce political results, so it is difficult to get much financial support from the local government. Therefore, more funds will be obtained mainly through small animal lovers who will donate money to relevant organizations or through activities and campaigns to make more people love cats, thus increasing funds. Besides, it is possible to get support from some foundations. Additionally, policymakers should provide legal protections for TNR programs and caregivers to ensure that they can continue to operate without interference.

2. TNR pet welfare organizations should focus on public education and participation: Many people are unaware of the benefits of TNR programs and the negative impact that stray cats can have on their communities. TNR pet welfare organizations should prioritize public education efforts to increase awareness and understanding of TNR programs. They should also encourage more community involvement in TNR efforts by offering training and support for volunteer caregivers.

3. TNR pet welfare organizations should improve their approach to TNR: Although the TNR program has reduced the number of stray cats according to surveys and interviews, there is always room for improvement. The Hangzhou Animal Husbandry and Veterinary Bureau, as the responsible unit, should continuously evaluate the TNR program and make adjustments as needed to ensure that they are achieving their goals. This may include implementing new technologies or techniques for trapping and sterilizing cats, collaborating with other animal protection organizations or with pet-related businesses to improve outreach, or developing new programs to address specific needs in their communities.

4. Develop partnerships between TNR organizations and local animal shelters: Collaboration between TNR organizations and animal shelters can help increase the effectiveness of TNR programs. At present, the main sheltering places in Hangzhou are still dominated by pet hospitals as well as rescue bases. However, many places have already shown a trend of saturation in number. At the same time, there are few responsible relevant personnel, and they are basically maintained with funds donated by individuals and caring people. Therefore, increasing the number of animal shelters is a worthy consideration. This is because it can provide resources such as veterinary care, supplies, and training for TNR caregivers. In addition, the TNR program can help reduce the number of cats entering the animal shelters, thus saving resources and improving the welfare of cats in the shelters.
5. Increase community outreach and engagement: TNR pet welfare organizations should strive to engage a diverse range of community members in their programs, including residents, businesses, and community leaders. They should develop targeted outreach efforts that are culturally appropriate and that address specific concerns or barriers to participation. For example, they need to increase the communication about their purpose and achievements and also increase participation.

6. Develop standardized metrics to measure the success of TNR programs: TNR pet welfare organizations should work together to develop standardized metrics to measure the success of TNR programs. These metrics could include measures such as the number of cats sterilized, the number of new kittens born, and the reduction in complaints related to stray cats. Having standardized metrics will make it easier to compare the effectiveness of different TNR programs and to evaluate the impact of changes in program design or implementation.

7. Conclusion

Stray cats pose a challenge in many parts of the world, as their populations can spiral out of control without proper management. These cats generate conflicting attitudes among the public, intensifying social attention. A survey analysis shows that the majority of people believe that stray cats need help and their numbers should be controlled. The perceptions of local citizens towards the Hangzhou TNR program suggest that there is generally a positive attitude toward the program and its outcomes. Meanwhile, the TNR program implementation in Hangzhou provides a preliminary evidence of the achievement of reducing the number of stray cats in the city and improving their quality of life. However, challenges still exist, including the high cost of implementation, a corresponding lack of funding, and concerns about the follow-up work after release. Increasing public awareness and education to encourage more people to adopt and support TNR programs is necessary. Collaborative efforts between local authorities and citizens are essential to ensure the program's long-term success.

In conclusion, addressing funding, administrative procedures, increasing adoption, and raising public awareness can all contribute to the success of TNR programs. By taking a proactive and compassionate approach toward community cat populations, we can create a more humane and sustainable future for both stray cats and our communities.
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