



Social vulnerability assessment of dog intake location data as a planning tool for community health program development: A case study in Athens-Clarke County, GA, 2014-2016.

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National Council on Pet Population

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How can we determine which pet owners need the most help?





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What is Social Vulnerability?


Social vulnerability refers to the community's ability to "bounce back" or resilience



Originally used in disaster research as a predictor areas which **may need support** in preparing for hazards; or recovering from disaster.




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Social Vulnerability Index

Reported measure: **Overall Social Vulnerability**

Domain:	Socioeconomic Status	Household Composition & Disability	Minority Status & Language	Housing & Transportation
Example Human Factors:	Example: Income	Example: Age 65 or older	Example: Minority status	Example: Crowded housing



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Social Vulnerability Index ^{+ dogs!!}

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Example Dog Factors:	Access to preventative vet care	Generational view of dog role (i.e. companion vs yard dog)	Barriers to community outreach initiatives	Limited access to veterinary offices and pet supply stores

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Athens-Clarke County, GA (ACC)




34.1% of ACC's population lived below the poverty line in 2017.

The national average is **13.4%**

ACC Animal Control is an **open admission shelter**.


Admits **ALL** animals from ACC regardless of the animal's physical, mental condition, or availability of housing space.



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Study Site: ACC Animal Control

Animals intake:
Strays
Owner surrendered
Captured
or Unknown
(information not recorded)



Dog kennels:
36 large
5 small (up to 15lbs)
5 rabies quarantine

Study used ACCAC **dog intake data** from January 1, 2014 - December 31, 2016.

Disposition:
Adopted
Reclaimed by owner
Euthanized
or Other

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ACC Animal Control

Animal caretakers perform a **basic health** assessment upon intake



Most dogs receive: **DHPP vaccine** and **Bordetella vaccine**







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www.athenspets.net

All other ACC Animal Control veterinary care was funded through a non-profit until **very recently**






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Health Categories

- Healthy
- Known health issue upon intake
- Visible health issues typically associated with physical neglect
- Behaviors typically associated with social neglect
- Visible health issues typically associated with vehicular trauma

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Signs of Physical Neglect

Includes the presence of **preventable** or **treatable** conditions.

May be the result of **short-term care deficits** (such as flea infestations) or **longer-term care deficits** (such as collar embedding)

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Signs of Social Neglect

May include **inappropriate reactions** to other dogs if they don't speak "dog"



The subtle signaling of **non-verbal** communications may go unnoticed.

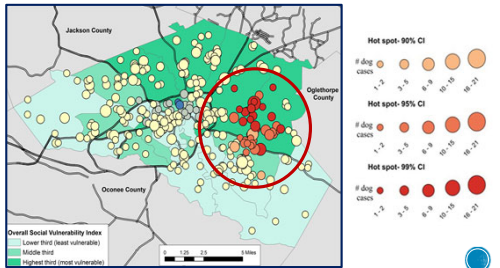
Includes the presence of **undesirable responses** to unfamiliar situations



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Methods: Spatial Analysis

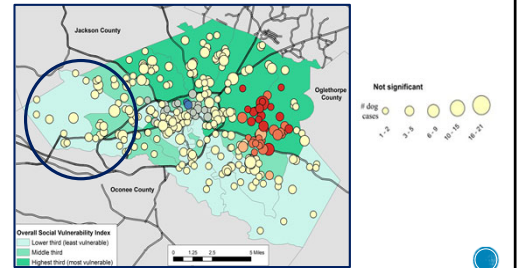
Hot spots are statistically significant positive clusters of dogs higher than the expected rate



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Methods: Spatial Analysis

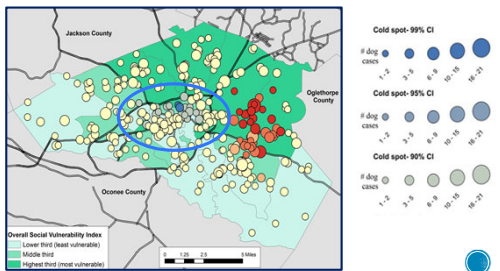
Some clusters may not be statistically significant



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Methods: Spatial Analysis

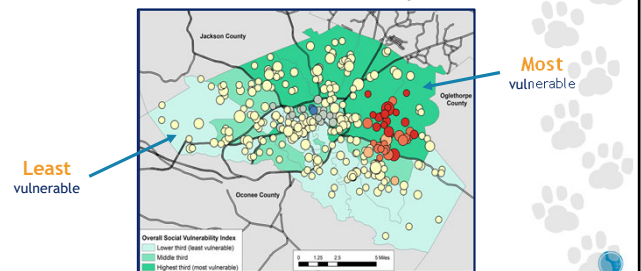
Cold spots are statistically significant positive clusters of dogs lower than the expected rate



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Social Vulnerability Index



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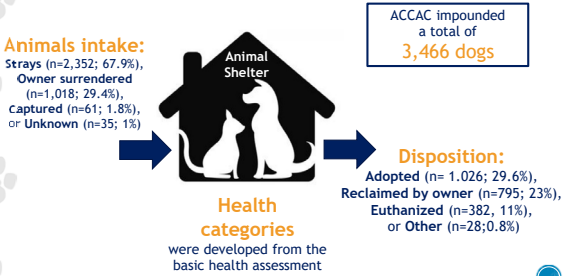
Methods: Statistical Analysis



- one-way ANOVA
 - To assess the relationships between environmental conditions (i.e., overall vulnerability by census tracts SVI ranking) and categorical variables (i.e., age group, health category, final disposition, and reason for euthanasia)
- Tukey test post-hoc analysis for one-way ANOVA results
- Results of the Tukey test indicate which characteristic groups were significantly different from other characteristic groups for the same variable.

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Results: Overview



Animals intake:
 Strays (n=2,352; 67.9%),
 Owner surrendered (n=1,018; 29.4%),
 captured (n=61; 1.8%),
 or Unknown (n=35; 1%)

ACCAC impounded a total of 3,466 dogs

Disposition:
 Adopted (n= 1,026; 29.6%),
 Reclaimed by owner (n=795; 23%),
 Euthanized (n=382, 11%),
 or Other (n=28;0.8%)

Health categories were developed from the basic health assessment

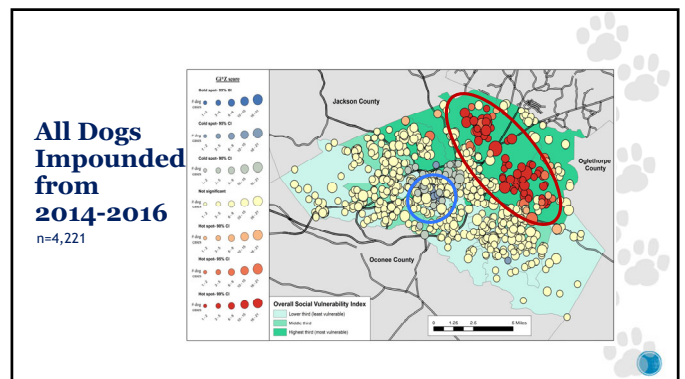
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Athens-Clarke County Animal Control health or behavioral category of impounded dogs at time of intake, by year, 2014-2016.

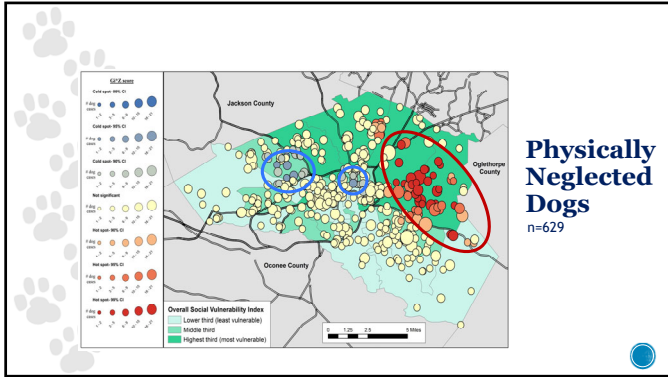
Health or behavioral category at time of intake*	Year			Total
	2014	2015	2016	
Healthy	804	814	666	2,284 (54.1%)
Known health issue upon intake	355	333	305	993 (23.5%)
Visible health issues typically associated with physical neglect	228	212	189	629 (15%)
Behaviors typically associated with social neglect	97	103	69	269 (6.4%)
Visible health issues typically associated with vehicular trauma	14	21	11	46 (1.1%)
Total:	1,498	1,483	1,240	4,221

*Dogs may be in more than one category.

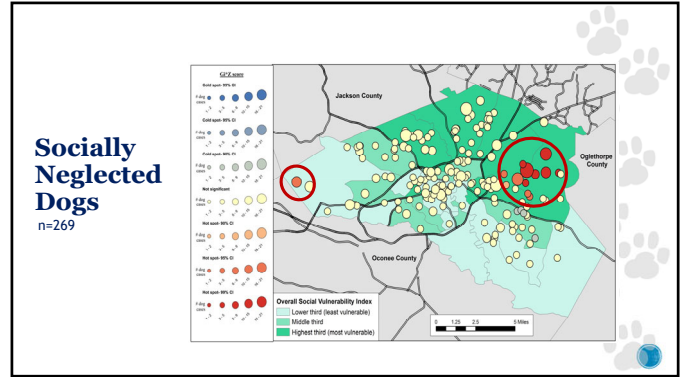
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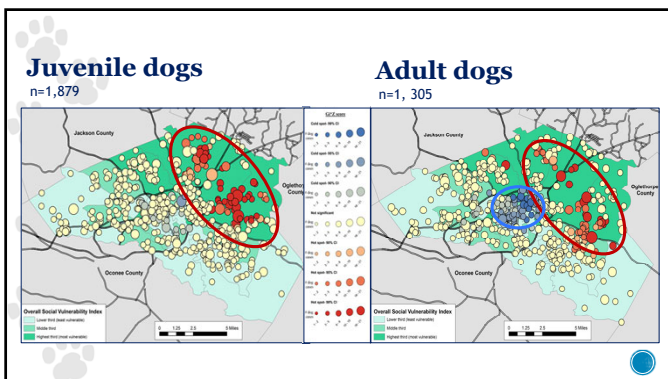
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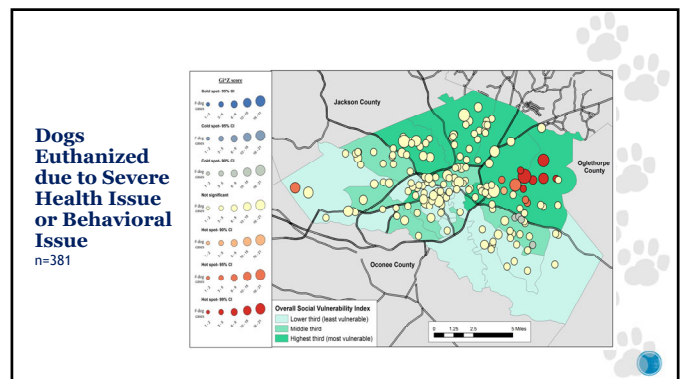
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ANOVA analysis of Athens-Clarke County Animal Control dog intake characteristics for overall Social Vulnerability Index ranking, 2014-2016

Relationships are statistically significant if the p-value < 0.05

Characteristic	Overall SVI ^a			One-way ANOVA results
	N	Mean	SD	
Method of intake				F=5.65, p = 0.0044**
Owner surrender	935	0.5844	0.2866	
Stray	2,141	0.5821	0.2794	
Live trap	53	0.7053	0.2626	
Age group				F=15, p <0.001**
Juvenile	1,711	0.6089	0.2810	
Adult	1,191	0.5524	0.2780	
Senior	241	0.5643	0.2872	

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Characteristic	Overall SVI ^a			One-way ANOVA results
	N	Mean	SD	
Health or behavioral category***				F=2.53, p =0.0296**
Behaviors typically associated with social neglect	206	0.6328	0.2739	
Visible health issues typically associated with vehicular trauma	44	0.6100	0.2819	
Visible health issues typically associated with physical neglect	522	0.5838	0.2865	
Visible health issues typically associated with physical neglect and behaviors typically associated with social neglect	51	0.6216	0.3016	
Known health issue upon intake	391	0.6062	0.2836	
Healthy	1,946	0.5735	0.2795	

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Characteristic	Overall SVI ^a			One-way ANOVA results
	N	Mean	SD	
Final disposition				F=5.63, p <0.000**
Adopted	846	0.5828	0.2840	
Euthanized	381	0.6115	0.2826	
Transferred to animal rescue group	724	0.5508	0.2677	
Reclaimed by owner	1,181	0.5959	0.2873	
Reason for euthanasia				F=3.29, p =0.018**
Fought with another dog on property	16	0.5754	0.2797	
Medical necessity	131	0.6671	0.2784	
Reactivity	99	0.6348	0.2743	
Space	12	0.5274	0.3248	
Unknown	123	0.5464	0.2787	

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Post-hoc analysis of one-way ANOVA on Athens-Clarke County Animal Control dog intake characteristics by Tukey test, 2014-2016.

Relationships are statistically significant if the p-value < 0.05

Characteristics		Overall SVI*		
		Mean difference	95% Confidence Interval	
Age group- Juvenile	Age group- Adult	0.057**	0.032	0.081
Health or behavioral category- Behaviors typically associated with social neglect	Health or behavioral category- Known health issue upon intake	0.049**	-0.017	0.115
Health or behavioral category- Visible health issues typically associated with physical neglect	Health or behavioral category- Healthy or whose health status was unknown	0.048**	-0.066	0.162
Final disposition- Euthanized due to reactivity	Final disposition- Reclaimed by owner	0.061**	0.015	0.106

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Conclusion

The study found statistically significant hot spots of several dog characteristics clusters associated with greater social vulnerability




Results support that humans and dogs that share physical and social environments are similarly vulnerable populations

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Acknowledgments

- Thank you to National Council on Pet Population Board for the opportunity to present this research.
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