

A survey of opinions towards dog and cat management policy issues in New Zealand

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Supplementary Table 1. Importance of different pet management practices to 443 dog owners, 696 cat owners, and 559 respondents with no pets.

Variable	Respondent Type	Level of importance (n, (%))			
		Not important	Somewhat important	Very important	Don't know
Desexing	Dog Owners	24 (5.4%)	113 (25.5%)	288 (65.0%)	18 (4.1%)
	Cat Owners	12 (1.7%)	116 (16.7%)	554 (79.5%)	14 (2.0%)
	Own No Pets	24 (4.3%)	128 (22.9%)	359 (64.2%)	48 (8.9%)
Preventing predation	Dog Owners	13 (2.9%)	108 (24.4%)	264 (59.6%)	58 (13.1%)
	Cat Owners	27 (3.9%)	233 (33.4%)	339 (48.7%)	97 (13.9%)
	Own No Pets	5 (0.9%)	113 (20.2%)	369 (66.0%)	72 (12.9%)
Exercise	Dog Owners	2 (0.5%)	44 (9.9%)	388 (87.6%)	9 (2.0%)
	Cat Owners	21 (3.0%)	106 (15.2%)	550 (79.0%)	19 (2.7%)
	Own No Pets	4 (0.7%)	40 (7.2%)	504 (90.2%)	11 (2.0%)
Microchipping	Dog Owners	44 (9.9%)	166 (37.5%)	214 (48.3%)	19 (4.3%)
	Cat Owners	151 (21.7%)	276 (39.7%)	221 (31.8%)	48 (6.9%)
	Own No Pets	35 (6.3%)	217 (38.8%)	265 (47.4%)	42 (7.5%)
Registration	Dog Owners	28 (6.3%)	102 (23.0%)	303 (68.4%)	10 (2.3%)
	Cat Owners	129 (18.5%)	186 (26.7%)	336 (48.3%)	45 (6.5%)
	Own No Pets	10 (1.8%)	102 (18.2%)	426 (76.2%)	21 (3.8%)
Annual vet checks	Dog Owners	17 (3.8%)	109 (24.6%)	309 (69.8%)	8 (1.8%)
	Cat Owners	41 (5.9%)	227 (32.6%)	411 (59.1%)	17 (2.4%)
	Own No Pets	10 (1.8%)	124 (22.2%)	411 (73.5%)	14 (2.5%)
Vet visit if animal injured/sick	Dog Owners	1 (0.2%)	26 (24.6%)	406 (91.6%)	10 (2.3%)
	Cat Owners	4 (0.6%)	49 (7.0%)	632 (90.8%)	11 (1.6%)
	Own No Pets	0 (0.0%)	31 (5.5%)	516 (92.3%)	12 (2.2%)

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Providing adequate shelter	Dog Owners	2 (0.5%)	14 (3.2%)	416 (93.9%)	11 (2.5%)
	Cat Owners	8 (1.1%)	30 (4.3%)	648 (93.1%)	10 (1.4%)
	Own No Pets	1 (0.2%)	27 (4.8%)	522 (93.4%)	9 (1.6%)
Providing nutritious diet	Dog Owners	5 (1.1%)	21 (4.7%)	408 (92.1%)	9 (2.0%)
	Cat Owners	6 (0.9%)	34 (4.9%)	644 (92.5%)	12 (1.7%)
	Own No Pets	1 (0.2%)	15 (2.7%)	533 (95.3%)	10 (1.8%)

Supplementary Table 2. Univariable analysis of predictors for 613 dogs and 1,045 cats in New Zealand being desexed

Variable	Desexed		Intact		Univariable analysis		
	N	%	N	%	OR	95% CI	p-value
Species							
Cat	974	68.0%	71	31.6%	1.00	-	-
Dog	459	32.0%	154	68.4%	0.21	0.16 – 0.29	<0.001
Breed Type							
Mixed Breed	1054	73.6%	103	45.8%	1.00	-	-
Registered Pedigree	108	7.5%	46	20.4%	0.23	0.15 – 0.34	< 0.001
Pure Breed	230	16.1%	71	31.6%	0.32	0.23 – 0.44	< 0.001
Designer Breed	41	2.9%	5	2.2%	0.80	0.34 – 2.35	0.648
Source of Pet							
Pet Store	129	9.0%	21	9.3%	1.00	-	-
Breeder / Hobbyist	297	20.7%	77	34.2%	0.63	0.36 – 1.04	0.082
Animal Shelter	290	20.2%	14	6.2%	3.37	1.67 – 6.98	< 0.001
Acquaintance	425	29.7%	53	23.6%	1.31	0.75 – 2.21	0.336
Stray	133	9.3%	21	9.3%	1.03	0.54 – 1.98	0.927
Veterinarian	29	2.0%	4	1.8%	1.18	0.41 – 4.27	0.776
Other	130	9.1%	35	15.6%	0.60	0.33 – 1.08	0.097
Housing							
Indoor Only	175	12.2%	29	12.9%	1.00	-	-
Outdoor Only	83	5.8%	56	24.9%	0.25	0.14 – 0.41	< 0.001
Both Indoor and Outdoor	1175	82.0%	140	62.2%	1.39	0.89 – 2.11	0.133
Microchipped							
No	754	52.6%	144	50.7%	1.00	-	-
Yes	679	47.3%	81	49.3%	1.60	1.20 – 2.15	0.002
Region							
Auckland	429	29.9%	79	35.1%	1.00	-	-
Wellington	139	9.7%	14	6.2%	1.83	1.04 – 3.46	0.049
Other North Island	506	35.3%	74	32.9%	1.26	0.89 – 1.77	0.187
Christchurch	187	13.0%	26	11.6%	1.32	0.83 – 2.16	0.247
Other South Island	172	12.0%	32	14.2%	0.99	0.64 – 1.56	0.964
Location Type							
Urban	508	35.5%	92	40.9%	1.00	-	-
Suburban	561	39.1%	47	20.9%	2.16	1.50 – 3.16	< 0.001
Regional Centre	102	7.1%	14	6.2%	1.32	0.74 – 2.50	0.366

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Rural	262	18.3%	72	32.0%	0.66	0.46 – 0.93	0.017
Age							
18-24	186	13.0%	50	22.2%	1.00	-	-
25-29	103	7.2%	29	12.9%	0.95	0.57 – 1.61	0.861
30-34	125	8.7%	22	9.8%	1.53	0.89 – 2.69	0.131
35-39	140	9.8%	26	11.6%	1.45	0.87 – 2.46	0.165
40-44	126	8.8%	11	4.9%	3.08	1.60 – 6.44	0.001
45-49	159	11.1%	12	5.3%	3.56	1.89 – 7.22	< 0.001
50-54	129	9.0%	18	8.0%	1.93	1.09 – 3.53	0.028
55-59	132	9.2%	22	9.8%	1.61	0.94 – 2.84	0.088
60-64	133	9.3%	13	5.8%	2.75	1.47 – 5.46	0.002
65-69	85	5.9%	17	7.6%	1.34	0.75 – 2.52	0.340
70 and older	115	8.0%	5	2.2%	6.18	2.62 – 18.2	< 0.001
Gender							
Male	628	43.8%	107	47.6%	1.00	-	-
Female	805	56.2%	118	52.4%	1.16	0.88 – 1.54	0.295
Ethnic Group							
NZ European	1228	85.7%	138	61.3%	1.00	-	-
Maori	29	2.0%	12	5.3%	0.27	0.14 – 0.56	< 0.001
Other	176	12.3%	75	33.3%	0.27	0.19 – 0.37	< 0.001
Work Status							
Full time	702	49.0%	118	52.4%	1.00	-	-
Part time	372	26.0%	48	21.3%	1.30	0.92 – 1.88	0.148
Not working	359	25.1%	59	26.2%	1.02	0.73 – 1.44	0.896
Highest Education							
Below Year 13	242	16.9%	54	24.0%	1.00	-	-
Completed Year 13	220	15.4%	25	11.1%	1.96	1.19 – 3.31	0.009
Technical or Further Education	420	29.3%	51	22.7%	1.84	1.21 – 2.78	0.004
University	494	34.5%	83	36.9%	1.33	0.91 – 1.93	0.139
Prefer not to say	57	4.0%	12	5.3%	1.06	0.55 – 2.19	0.868
Household Income							
Under \$40k	289	20.2%	45	20.0%	1.00	-	-
\$40k - \$70k	333	23.2%	57	25.3%	0.91	0.59 – 1.38	0.660
\$71k - \$90k	186	13.0%	32	14.2%	0.92	0.56 – 1.49	0.689
More than \$90k	413	28.8%	69	30.7%	0.93	0.62 – 1.39	0.733
Prefer not to say	212	14.8%	22	9.8%	1.50	0.88 – 2.62	0.141
Marital Status							

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Single or Never Married	325	22.7%	51	22.7%	1.00	-	-
Living Together	297	20.7%	48	21.3%	0.97	0.63 – 1.48	0.892
Married	628	43.8%	97	43.1%	1.01	0.70 – 1.46	0.932
Divorced or Widowed	183	12.8%	29	12.9%	0.99	0.61 – 1.63	0.969
Number of Adults							
1	222	15.5%	28	12.4%	1.00	-	-
2	826	57.6%	126	56.0%	0.83	0.53 – 1.26	0.392
3	248	17.3%	31	13.8%	1.01	0.58 – 1.74	0.974
4	85	5.9%	13	5.8%	0.82	0.42 – 1.71	0.591
5	29	2.0%	9	4.0%	0.41	0.17 – 0.99	0.037
6 or more	23	1.6%	18	8.0%	0.16	0.16 – 0.34	< 0.001
Number of Children							
None	876	61.1%	124	55.1%	1.00	-	-
1	251	17.5%	43	19.1%	0.83	0.57 – 1.21	0.318
2	202	14.1%	38	16.9%	0.75	0.51 – 1.13	0.157
3	74	5.2%	6	2.7%	1.75	0.81 – 4.57	0.200
4	24	1.7%	13	5.8%	0.26	0.13 – 0.54	< 0.001
5 or more	6	0.4%	1	0.4%	0.85	0.14 – 16.1	0.880
Importance of desexing							
Not important	19	1.3%	45	20.0%	1.00	-	-
Somewhat important	228	15.9%	96	42.7%	5.62	3.17 – 10.3	< 0.001
Very important	1157	80.7%	71	31.6%	38.6	21.8 – 70.9	< 0.001
Don't know	29	2.0%	13	5.8%	5.28	2.31 – 12.7	< 0.001
Importance of predation							
Not important	39	2.7%	9	4.0%	1.00	-	-
Somewhat important	449	31.3%	65	28.9%	1.59	0.70 – 3.31	0.235
Very important	772	53.9%	112	49.8%	1.59	0.71 – 3.23	0.226
Don't know	173	12.1%	39	17.3%	1.02	0.44 – 2.21	0.955
Importance of routine vet care							
Not important	73	5.1%	18	8.0%	1.00	-	-
Somewhat important	429	29.9%	80	35.6%	1.32	0.73 – 2.29	0.335
Very important	902	62.9%	121	53.8%	1.84	1.04 – 3.12	0.030
Don't know	29	2.0%	6	2.7%	1.19	0.45 – 3.56	0.736
Total	1,433		225				

SupplementaryTable 3. Opinions of 1,572 survey respondents towards free-roaming cat management strategies in New Zealand stratified by key owner demographic characteristics.

Variable ^a	Levels	All Respondents (n = 1,572)		Cat Owners (n = 696)		Believes predation is a very important concern (n = 905)		Cat owners that keep cats indoors only (n = 60)		Does Not Own Any Pets (n = 559)	
		N	%	N	%	N	%	N	%	N	%
Aware of strays in the local community	Yes	445	28.3%	212	30.7%	266	29.4%	20	33.3%	148	26.5%
	No	947	60.2%	414	59.5%	536	59.2%	34	56.7%	338	60.4%
	Don't know	180	11.5%	68	9.8%	103	11.4%	6	10.0%	73	20.2%
Who should be responsible for strays?	Strays are self-sufficient	124	7.9%	58	8.3%	57	6.3%	4	6.7%	45	8.1%
	Everyone in the community	166	10.6%	96	13.8%	89	9.8%	10	16.7%	47	8.4%
	Local people	144	9.2%	76	10.9%	73	8.1%	6	10.0%	40	7.2%
	Local council	479	30.5%	178	25.5%	292	32.3%	17	28.3%	182	32.6%
	Animal welfare organization	546	34.7%	233	33.4%	333	36.8%	17	28.3%	216	38.6%
	None of the above	113	7.2%	55	7.9%	61	6.7%	6	10.0%	29	5.2%
How should stray cats be handled?	Left alone	152	9.7%	78	11.2%	71	7.8%	5	8.3%	48	8.6%
	Assessed and re-homed	331	21.1%	157	22.6%	201	22.2%	21	35.0%	110	19.7%
	Assessed and euthanized	787	50.1%	316	45.4%	456	50.4%	19	31.7%	301	53.8%
	Some other way	102	6.5%	60	8.6%	69	7.6%	8	13.3%	25	4.5%
	Don't know	200	12.8%	85	12.2%	108	11.9%	7	11.7%	75	13.4%
Predation by cats	Significant issue	393	25.0%	118	17.0%	280	30.9%	17	28.3%	161	28.8%
	Issue only in ecologically sensitive areas	736	46.8%	354	50.9%	425	47.0%	23	38.3%	250	44.7%
	Not an issue	289	18.4%	155	22.7%	131	14.4%	14	23.3%	94	16.8%
	None of the above	154	9.8%	69	19.0%	69	7.6%	6	10.0%	54	9.7%
Opinions on confining cats	Cats should be confined	577	36.7%	147	21.1%	378	41.8%	26	43.3%	271	48.4%
	Cats should be allowed to roam	713	45.4%	417	59.9%	369	40.8%	24	40.0%	198	35.4%
	None of the above	282	17.9%	132	18.9%	158	17.5%	10	16.7%	90	16.1%

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Keeping cats indoors at night should be enforced	No	777	49.4%	440	63.2%	391	43.2%	20	33.3%	230	41.1%
	Yes by owners	706	44.9%	239	34.3%	447	49.4%	35	58.3%	295	52.8%
	Yes by council	85	5.4%	17	2.4%	65	7.2%	5	8.3%	34	6.1%
	Yes by others	4	0.3%	0	0.0%	2	0.2%	0	0.0%	0	0.0%

^a Questions were worded to allow respondents to select only one option from the given choices

SupplementaryTable 4. Opinions of 1,572 survey respondents towards aggressive dog management strategies in New Zealand stratified by key owner demographic characteristics

Variable	Levels	All Respondents (n = 1,572)		Dog Owners (n = 443)		Respondent, Household Member or Pet Bitten in Last 12 months (n = 126)		Has at Least One Child Under 18 Years Old (n = 544)		Does Not Own Any Pets (n = 559)	
		N	%	N	%	N	%	N	%	N	%
Strategies to support safety around dogs ^a	Education programmes for children	1,055	67.1%	323	72.9%	84	66.7%	370	68.0%	352	62.9%
	Education programmes for teenagers and adults	838	53.3%	251	56.7%	65	51.5%	273	50.1%	287	51.3%
	Registration and education of dog owners	980	62.3%	242	54.7%	66	52.4%	317	58.3%	362	64.7%
	Additional enforcement power given to local councils	820	52.2%	206	46.5%	68	53.9%	294	54.0%	307	54.9%
	None of the above	71	4.5%	28	6.3%	4	3.2%	32	5.9%	22	3.9%
Course of action for dogs that have bitten people ^b	Dog should be destroyed	248	15.8%	47	10.6%	19	15.1%	88	16.2%	98	17.5%
	Dog should be assessed by an expert who will determine action	849	54.0%	240	54.2%	69	54.8%	300	55.1%	290	51.8%
	Dog should be given three-strikes before being assessed by an expert	155	9.9%	50	11.2%	12	9.5%	55	10.1%	54	9.7%
	Dog should remain on the owner's property at all times	72	4.6%	25	5.6%	12	9.5%	27	5.0%	25	4.5%
	Dog should always be muzzled in public	124	7.9%	35	7.9%	6	4.8%	31	5.7%	48	8.6%
	Something else	62	3.9%	22	5.0%	4	3.2%	16	2.9%	18	3.2%
	Don't know	62	3.9%	24	5.4%	4	3.2%	27	5.0%	26	4.7%
Course of action for dogs that have bitten other animals ^b	Dog should be destroyed	134	8.5%	21	4.7%	13	10.3%	48	8.8%	49	8.8%
	Dog should be assessed by an expert who will	820	52.2%	233	52.5%	62	49.2%	287	52.8%	289	51.7%

	determine action										
	Dog should be given three-strikes before being assessed by an expert	211	13.4%	61	13.7%	15	11.9%	82	15.1%	77	13.8%
	Dog should remain on the owner's property at all times	81	5.2%	25	5.6%	12	9.5%	30	5.5%	25	4.5%
	Dog should always be muzzled in public	203	12.9%	64	14.4%	14	11.1%	57	10.4%	75	13.4%
	Something else	34	2.2%	13	2.9%	2	1.6%	7	1.3%	7	1.3%
	Don't know	89	5.7%	26	5.9%	8	6.3%	33	6.1%	37	6.6%
Course of action for owners of dogs that have bitten people ^a	Owner should be fined	751	47.8%	178	40.2%	55	43.7%	267	49.1%	294	52.6%
	Owner should attend mandatory education programme	1,022	65.0%	289	65.2%	70	55.6%	352	64.7%	360	64.4%
	If dog was destroyed, owner should be banned from keeping other dogs	696	44.3%	161	36.3%	49	38.9%	232	42.6%	277	49.6%
	None of the above	115	7.3%	55	12.4%	17	13.5%	37	6.8%	26	4.7%
Course of action for owners of dogs that have bitten other animals ^a	Owner should be fined	674	42.8%	173	39.1%	46	36.5%	247	45.4%	253	45.3%
	Owner should attend mandatory education programme	1,024	65.1%	280	63.2%	78	61.9%	339	62.3%	377	67.4%
	If dog was destroyed, owner should be banned from keeping other dogs	592	37.7%	141	31.8%	44	34.9%	202	37.1%	221	39.5%
	None of the above	128	8.1%	52	11.7%	14	11.1%	37	6.8%	39	7.0%

^a Question was worded to allow respondents to select all options that apply from the given choices

^b Question was worded to allow respondents to select only one option from the given choices