

Birth and Death Rate Estimates of Cats and Dogs in U.S. Households and Related Factors

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Studies report variable factors associated with dog and cat surpluses in the United States. Estimates of cat and dog birth and death rates help understand the problem. This study collected data through a commercial survey company, distributing questionnaires to 7,399 cat- and dog-owning households (HHs) in 1996. The study used an

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unequal probability sampling plan and reported estimates of means and variances as weighted averages. The study used estimates of HHs and companion animals for national projections. More than 9 million owned cats and dogs died during 1996—yielding crude death rates of 8.3 cat deaths/100 cats in HHs and 7.9 dog deaths/100 dogs in HHs. The study reported twice as many kitten as puppy litters, with an average litter size of 5.73 and 7.57, respectively. The study reported data on planned versus unplanned litters, reasons caregivers did not spay females, disposition of litters, and sources of animals added to HHs. These first national estimates indicate the magnitude of, and reasons for, animals leaving HHs. The crude birth rate was estimated to be 11.2 kittens/100 cats in HHs and 11.4 puppies/100 dogs in HHs.

The National Council on Pet Population Study and Policy (Council) was formed in 1993 to gather and analyze data to characterize the number, origin, and disposition of cats and dogs in households (HHs) in the United States. Several studies were conducted in conjunction with the Council to explore factors associated with the dog and cat surplus (Kass, New, Scarlett, & Salman, 2001; New et al., 1999, 2000; Salman et al., 1998, 2000; Scarlett, Salman, New, & Kass, 1999). These studies were based largely on data collected from 12 animal shelters in four states with the purpose of identifying animal and human factors associated with relinquishment of dogs and cats. However, HHs that relinquish cats and dogs represent only one segment of the companion animal-owning population.

To understand better the factors that are associated with relinquishment throughout the United States, it also is helpful to estimate baseline data on the national cat and dog population. Important baseline data on cats and dogs in U.S. HHs include frequency and source of acquisition, frequency and method of disposition, reproductive status, reproductive history, and disposition of offspring. For comparison purposes, scientists associated with the Council partnered with the American Veterinary Medical Association (AVMA) during their general survey of companion animal owning HHs (AVMA, 1997).

The Council's Pet-Owning Household Survey was designed to collect data from HHs with companion animals that had not been collected previously on a national basis. Data collection included information on how animals left HHs and how they were added to HHs, including births of litters and whether these were planned or unplanned litters. Information was also collected on reasons why companion animal caregivers had not had females spayed prior to birth of unplanned litters. The purpose of this article is to report the findings from this survey, including estimates of crude birth and death rates for cats and dogs.

MATERIALS AND METHOD

The Household Survey was conducted in 1997 and collected data on HHs in 1996. The survey was divided into two phases. Phase 1 was conducted by Na-

tional Family Opinion of Toledo, Ohio (NFO) in conjunction with the AVMA. NFO maintains a panel of HHs that is representative of the United States and that is based on size of HH, age of occupants, HH income, geographic location, and other characteristics. The AVMA/NFO survey included 80,000 HHs. The response rate was 75% and summary results were reported previously (AVMA, 1997). Based on responses to the Phase 1 survey, 12,960 HHs were identified as having at least one cat and 14,947 as having at least one dog during 1996.

Phase 2 was a follow-up survey using a questionnaire (available from the first author by request) designed by Council board members and their scientific advisory committee. Phase 2 included 7,399 HHs identified from Phase 1 as having owned at least one dog and/or cat in 1996. The response rate was 89%, and HHs surveyed were divided about equally between HHs with dogs and HHs with cats. A small portion of HHs had both species and were asked to complete both the cat-caregiver and dog-caregiver questionnaire ($n = 601$).

An unequal probability sampling plan was used to select the 7,399 HHs needed for Phase 2. The size of the Phase 2 sample was determined by the study budget in regard to the number of HHs that could be surveyed a second time. All HHs indicating that a dog and/or cat left the HH during the year were included ($n = 3,087$). The remainder of the sample was randomly selected ($n = 4,312$). The Horvitz–Thompson Estimator (Thompson, 1992) was used to get an unbiased estimate of proportions (percentages) and variances.

Percentages reported in this article are weighted averages that reflect the sampling plan and assume that nonresponders do not differ significantly from responders. To get estimates of total numbers of HHs and animals, the unbiased estimates were multiplied by the number of HHs or animals reported during Phase 1—31.2 million dog-owning HHs and 27.0 million cat-owning HHs (AVMA, 1997).

The additional variance resulting from multiplying the two estimates (percentages and number of HHs or animals) was assumed to be insignificantly small regarding data in all tables. HHs that reported having at least one litter of kittens or puppies were cross-classified based on whether the litters were planned and the number of litters reported. Cross-classification by number of animals in the HH (single- or multiple-animal HHs) and whether a litter was born (yes or no) was also performed. Associations of these cross-classifications were evaluated by chi-square analysis. Odds ratios (ORs) and 95% confidence intervals (CIs) were calculated for the data on litters as effect measures from stratified analysis (Mantel–Haenszel) using Epi-Info (Dean et al., 1994); p values less than .05 were considered statistically significant.

RESULTS

The 6,573 HHs that returned questionnaires comprised the basis of the following tables. Approximately equal numbers of HHs with cats ($n = 3,558$) and HHs

with dogs ($n = 3,530$) returned questionnaires. Of HHs that responded, 515 had both species. Table 1 presents the estimated number of cats and dogs who left HHs during 1996 and the reasons they left. The most frequent reason reported was that the cat or dog died or was killed. Specific causes of death were not collected. Because euthanasia was a different category, these deaths are assumed to be natural, accidental, or intentional (other than euthanasia) deaths.

Caregivers reported that 3.4 million cats and 2.4 million dogs died during the year. Additional cats and dogs were euthanized because of illness, age, or other reasons. Rarely did respondents indicate what the other reasons were for having an animal euthanized. One reason given was that euthanasia was recommended by health authorities because of exposure to a known, or potentially, rabid animal. The Phase 2 survey estimated that more than 9 million dogs and cats died (all reasons) during the year. The Phase 1 survey estimated that there were 59.1 million cats and 52.9 million dogs in HHs during 1996 (AVMA, 1997). Using these estimates, the crude death rate for cats and dogs in 1996 was 8.3 cat deaths per 100 cats in HHs and 7.9 dog deaths per 100 dogs in HHs.

The "disappeared" category included animals reported stolen and those who "ran off/wandered off." Three times more cats than dogs disappeared. The survey estimates that almost a million more cats than dogs were given away. Fewer dogs than cats were relinquished to shelters or taken away by animal control officers. Not enough cats were sold to evaluate further this reason for leaving.

Table 2 presents data on the percentage and numbers of litters and animals from the litters born during the study year. A total of 317 (9.2%) of 3,457 cat-owning HHs that answered the question about litters reported litters born during the study year. A total of 3,158 kittens (727 male, 815 female, and 1,616 of unknown sex) were reported from 598 litters. A total of 216 (216/317, 68%) reported that the litters of kittens were unplanned; of these, 101 HHs (101/216, 47%) reported more than one litter during the study year ($M = 2.9$ litters per HH with multiple unplanned litters). Sixty-eight HHs (68/317, 21%) reported that the litters were planned; of these 34 HHs (34/68, 50%) reported more than one litter during the study year ($M = 2.9$ litters per HH with multiple-planned litters). Planning information was not provided for 33 HHs that reported litters. The association between planning and number of litters was not statistically significant with HHs that planned litters being no different from HHs in which litters were not planned regarding multiple litters (OR = 1.06; 95% CI = 0.59, 1.91; $p = .82$). The odds of multiple-cat HHs reporting at least one litter were 8.35 times higher than were single-cat HHs (95% CI = 5.55, 12.65; $p < .001$).

One hundred fifty-four (4.4%) of 3,423 dog-owning HHs that answered the question about litters reported litters of puppies born during the study year. A total of 1,349 puppies (676 male, 650 female, and 23 of unknown sex) were reported from 255 litters. Eighty-seven HHs (87/154, 56%) reported that the litters were unplanned; of these, 18 (18/87, 21%) reported more than one litter during the study year

TABLE 1
Estimates of Cats and Dogs That Left U.S. HHs in 1996 and Why They Left

	% of HHs That Had at Least 1 Cat Leave			No. of HHs			No. of Cats			% of HHs That Had at Least 1 Dog Leave			No. of HHs			No. of Dogs			
	N	SD	95% CI	N	95% CI	N	95% CI	N	95% CI	N	SD	95% CI	N	95% CI	N	95% CI	N	95% CI	
HHs that had at least 1 animal leave because it:																			
Died or was killed	23.1	0.7	21.8, 24.4	6.24	5.89, 6.59	11.27	10.64, 11.90	20.8	0.7	19.5, 22.1	6.49	6.08, 7.00	7.13	6.68, 7.69					
Was euthanized—ill/old	8.3	0.4	7.6, 9.0	2.23	2.04, 2.42	3.43	3.14, 3.72	6.8	0.3	6.2, 7.5	2.15	1.94, 2.36	2.44	2.20, 2.68					
Was euthanized—Other	4.5	0.3	4.0, 5.0	1.22	1.07, 1.36	1.34	1.18, 1.50	5.1	0.3	4.6, 5.7	1.60	1.43, 1.77	1.60	1.43, 1.77					
Died (all reasons)	0.4	0.1	0.24, 0.54	0.11	0.07, 0.15	0.13	0.08, 0.18	0.7	0.1	0.5, 0.9	0.21	0.15, 0.28	0.21	0.15, 0.28					
Disappeared	13.2	0.5	12.3, 14.1	3.56	3.31, 3.80	4.90	4.56, 5.23	12.7	0.5	11.8, 13.6	3.96	3.68, 4.23	4.16	3.87, 4.45					
Was given away	4.9	0.3	4.3, 5.5	1.33	1.17, 1.49	1.90	1.68, 2.13	1.9	0.2	1.5, 2.3	0.60	0.48, 0.73	0.60	0.48, 0.73					
Went to shelter/animal control	4.1	0.3	3.6, 4.7	1.12	0.97, 1.27	2.86	2.47, 3.25	3.6	0.3	3.1, 4.1	1.13	0.96, 1.29	1.96	1.67, 2.25					
Was sold	1.2	0.2	0.9, 1.5	0.32	0.24, 0.41	0.64	0.48, 0.81	0.8	0.1	0.7, 1.0	0.25	0.21, 0.30	0.45	0.37, 0.53					
Left for other reasons	0.6	0.1	0.4, 0.9	0.17	0.11, 0.24	0.28	0.17, 0.38	0.5	0.1	0.3, 0.7	0.15	0.09, 0.22	0.20	0.11, 0.28					

Note. Numbers of HHs and animals are in millions. HHs could have lost more than one animal during the year for different reasons. HHs = households; NA = not applicable.

TABLE 2
 Estimated Percentage and Number of Litters (Planned and Unplanned) of Kittens
 and Puppies Born in U.S. HHs in 1996

	Kittens			Puppies		
	<i>N</i>	<i>SD</i>	<i>95% CI</i>	<i>N</i>	<i>SD</i>	<i>95% CI</i>
% of all U.S. cat- or dog- owning HHs that had at least 1 litter born	5.2	0.3	4.5, 5.9	2.6	0.3	2.1, 3.1
% of HHs that had at least 1 planned litter	1.1	0.2	0.7, 1.4	1.2	0.2	0.8, 1.6
% of HHs that had at least 1 unplanned litter	3.6	0.3	2.9, 4.2	1.4	0.2	1.0, 1.7
No. of HHs that had at least 1 litter ^a	1.40		1.22, 1.58	0.81		0.64, 0.98
No. of HHs that had at least 1 planned litter	0.34		0.23, 0.44	0.37		0.25, 0.49
No. of HHs that had at least 1 unplanned litter	1.11		0.92, 1.31	0.42		0.31, 0.54
No. of litters born in U.S. HHs ^a	2.59		2.26, 2.92	1.16		0.92, 1.40
No. of litters that were planned	0.66		0.45, 0.86	0.60		0.40, 0.80
No. of litters that were unplanned	2.10		1.73, 2.47	0.55		0.40, 0.70
No. of animals born in U.S. HHs ^a	6.63		5.78, 7.48	6.04		4.78, 7.30
No. of animals from planned litters ^a	1.75		1.20, 2.30	3.38		2.27, 4.49
No. of animals from unplanned litters	5.46		4.50, 6.43	2.60		1.88, 3.32
<i>M</i> ^b no. of litters born in HHs that had at least 1 litter	1.72			1.45		
<i>M</i> ^b no. of animals born in U.S. HHs that had at least 1 litter	5.73			7.57		

Note. HHs = households.

^aGiven in millions. ^bNot all HHs that reported having at least one litter provided the number of litters and the number of animals born. These means are based on 267 of 317 cat-owning HHs and 149 of 154 dog-owning HHs that reported at least one litter being born in 1996 and provided the number of litters and animals born.

($M = 3.6$ litters per HHs with multiple-unplanned litters). Sixty HHs (60/154, 39%) reported that the litters were planned; of these, 20 HHs (20/60, 33%) reported more than one litter during the study year ($M = 3.8$ litters per HHs with multiple-planned litters). The association between planning and number of litters was statistically significant, with the odds of multiple litters occurring in HHs that planned litters being 2.68 times greater than HHs in which litters were not planned (95% CI = 1.10, 6.61; $p < .02$). The odds of multiple-dog HHs reporting litters were 9.47 times greater than were single-dog HHs (95% CI = 5.71, 15.88; $p < .001$).

Almost twice as many HHs reported having at least one litter of kittens than reported at least one litter of puppies, and more than twice as many litters of kittens

were reported than litters of puppies (Table 2). However, a similar number of kittens and puppies were born because the mean number of animals born per litter was less for kittens ($M = 5.73$) than for puppies ($M = 7.57$). The estimated number of HHs that had at least one planned litter of kittens (0.34 million) or puppies (0.37 million) was similar, as was the number of HHs that reported at least one unplanned litter of puppies (0.42 million). However, there were more than three times as many HHs with unplanned litters of kittens (1.11 million). The estimated number of litters was similar for the categories of planned litters of kittens (0.66 million), puppies (0.60 million), and unplanned litters of puppies (0.55 million).

There were more than three times as many unplanned litters of kittens (2.1 million) compared to the other categories. More puppies came from planned litters than unplanned litters (3.38 million and 2.60 million, respectively). However, there were more than three times as many kittens from unplanned litters versus planned litters (5.46 million and 1.75 million, respectively). The mean number of litters of kittens and puppies per HH that reported at least one litter was similar ($M = 1.72$ and 1.45 , respectively). On average, however, the number of puppies born per litter (7.57 average number of puppies per litter/ 1.45 average litters born = 5.2) was larger than that for kittens ($5.73/1.72 = 3.3$). Using the Phase 1 survey estimates of total number of animals in HHs during 1996 (AVMA, 1997), the crude birth rate was 11.2 kittens born per 100 cats in HHs and 11.4 puppies born per 100 dogs in HHs.

Of those HHs that reported having at least one unplanned litter of puppies or kittens during the year, we asked the reason(s) for not having the mother of the litter spayed before pregnancy (Table 3). Respondents could give multiple reasons. Cost was the most frequent reason given by HHs with litters of kittens, whereas "Did not know she was in heat" was the most frequent reason given by HHs with litters of puppies. In general, HHs with litters of kittens gave more varied reasons for not having the mother spayed before pregnancy than did HHs with litters of puppies. Some respondents indicated they thought that the procedure (spaying) was dangerous, but there were insufficient data for either species on which to base national estimates.

Other reasons given for not having the procedure done prior to the birth of kittens included the following:

1. Some cats were strays and showed up at the HHs already pregnant.
2. Others were considered wild, feral, or "barn cats."
3. Some respondents indicated they wanted kittens. For HHs that had litters of puppies, specific other reasons given for not having the procedure done were rarely provided and showed no apparent pattern.

Table 4 displays the disposition of kittens and puppies from sampled HHs. Kittens most frequently were given away, reported to have died, were killed, or were

TABLE 3
 Estimates of U.S. Cat- and Dog-Owning HHs in 1996 That Had Unplanned Litters by Reason for Not Having the Mother Spayed

Reasons ^a	% of All Cat-Owning HHs			No. of Cat-Owning HHs			% of All Dog-Owning HHs			No. of Dog-Owning HHs			
	N	SD	95% CI	N	95% CI	N	SD	95% CI	N	SD	95% CI	N	95% CI
Could not afford	1.8	0.2	1.4, 2.2	0.49	0.38, 0.60	0.6	0.1	0.4, 0.9	0.17	0.11, 0.23			
Going to get rid of	0.05	0.01	0.03, 0.06	0.013	0.008, 0.017			Insufficient data					
Did not know she was in heat	0.6	0.1	0.4, 0.8	0.15	0.10, 0.21	1.8	0.2	1.4, 2.2	0.49	0.38, 0.60			
Do not believe in altering animals	0.4	0.1	0.2, 0.6	0.10	0.05, 0.16			Insufficient data					
Procedure is inconvenient	0.8	0.1	0.5, 1.0	0.2	0.14, 0.27			Insufficient data					
Forgot/no time	0.06	0.01	0.04, 0.08	0.49	0.38, 0.60	0.25	0.07	0.1, 0.39	0.07	0.03, 0.10			
Thought she was too young	0.4	0.1	0.2, 0.6	0.11	0.07, 0.16	0.13	0.01	0.11, 0.15	0.035	0.029, 0.042			
Other reasons	0.9	0.1	0.6, 1.2	0.25	0.17, 0.32	0.36	0.1	0.17, 0.55	0.10	0.05, 0.15			

Note. Numbers of HHs and animals are in millions. HHs = households.

^aOf all HHs reporting that they had at least one unplanned litter, these are the reasons given for not having had the mother spayed before pregnancy. HHs could have given more than one reason for not having the mother of an unplanned litter spayed.

TABLE 4
 Estimated Number in Millions of Kittens and Puppies Born in U.S. Households in 1996,
 by Disposition

<i>Disposition</i>	<i>Kittens</i>		<i>Puppies</i>	
	<i>N</i>	<i>95% CI</i>	<i>N</i>	<i>95% CI</i>
Given away	2.91	2.50, 3.32	1.93	1.52, 2.34
Taken to shelter	0.32	0.28, 0.37	0.41	0.32, 0.49
Sold/given to pet shop	0.06	0.05, 0.07	0.14	0.11, 0.17
Sold to an individual	0.11	0.10, 0.13	2.19	1.73, 2.66
Kept/still have	1.51	1.30, 1.72	0.52	0.41, 0.63
Euthanized	0.15	0.13, 0.18	Insufficient data	
Died/killed	1.67	1.44, 1.91	0.40	0.31, 0.48
Disappeared	0.12	0.10, 0.14	0.033	0.026, 0.04
Other	0.11	0.09, 0.12	Insufficient data	

still in the HHs. Puppies most frequently were reported as sold or given away. Compared to puppies, approximately 1 million more kittens were given away, died, were killed, or were still in the home. More than 2 million more puppies than kittens were sold (relatively few kittens were sold), but more kittens than puppies disappeared. Similar numbers of kittens and puppies were taken to animal shelters. Only a few caregivers of litters of puppies indicated an “other” disposition such as giving puppies to the caregiver of the sire of the litter (“pick of the litter”). The most frequent other disposition of kittens had to do with the mother and kittens being wild, feral, or barn cats. Although this is not a disposition, not enough information was given, or known, to classify these kittens in any other category.

Table 5 shows the number of cats and dogs added to HHs during the year by source. An estimated total of 4.62 million HHs (17.1%) added an estimated total of 8.6 million cats. More than one source was possible per HH that reported adding a cat. Cats were added to HHs most often—based on the percentage of HHs—because they were abandoned or stray (“just showed up”), representing 30.9% of HHs that added cats and 24.1% of all cats added. Friends or neighbors were a source of cats for 15.5% of HHs that added cats and 12.9% of cats added to HHs. Offspring of cats already in the HH were the source of new cats for 15.2% of HHs and 34.4% of cats added. Shelters were the source of new cats for 13.2% of HHs and 9.5% of all cats added. Strangers were the source of cats for 7.7% of HHs and 6.4% of cats.

New dogs most often came from breeders—with 18.8% of HHs that added a dog reporting this source and 15.8% of new dogs coming from this source. Friends or neighbors were the source of new dogs for 16.7% of HHs and 14.3% of dogs added. Strangers were the source of new dogs for 13.4% of HHs and 10.7% of dogs

TABLE 5
Estimates of Source of Cats and Dogs Added to U.S. HHs in 1996

	% of HHs That Had at Least 1 Cat Added			No. of HHs			% of HHs That Had at Least 1 Dog Added			No. of HHs			No. of Dogs		
	N	SD	95% CI	N	95% CI	N	SD	95% CI	N	SD	95% CI	N	95% CI	N	95% CI
HHs that had at least 1 animal added from:															
Offspring	17.1	0.7	15.8, 18.5	4.62	4.25, 4.99	8.60	7.92, 9.28	13.6	0.7	12.3, 14.9	4.25	3.84, 4.66	5.99	5.41, 6.57	
Pet shop	2.9	0.2	2.4, 3.4	0.79	0.66, 0.92	2.96	2.47, 3.45	1.6	0.2	1.1, 2.0	0.50	0.36, 0.64	1.59	1.14, 2.03	
Breeder	0.6	0.1	0.3, 0.9	0.16	0.09, 0.23	0.19	0.10, 0.27	0.5	0.1	0.2, 0.7	0.14	0.06, 0.22	0.17	0.07, 0.26	
Shelter	0.2	0.05	0.1, 0.3	0.06	0.03, 0.08	0.08	0.04, 0.11	2.7	0.3	2.1, 3.3	0.84	0.66, 1.02	0.95	0.75, 1.16	
Veterinarian	2.5	0.3	2.0, 3.1	0.69	0.54, 0.83	0.82	0.65, 0.99	1.5	0.2	1.1, 2.0	0.48	0.34, 0.62	0.51	0.36, 0.66	
Rescue group	0.3	0.1	0.1, 0.5	0.09	0.04, 0.14	0.09	0.04, 0.15	0.15	0.07	0.01, 0.28	0.05	0.003, 0.09	0.05	0.003, 0.1	
Friend/neighbor	0.2	0.09	0.05, 0.39	0.06	0.01, 0.10	0.09	0.02, 0.15	0.3	0.1	0.08, 0.47	0.08	0.02, 0.15	0.11	0.03, 0.18	
Family	3.0	0.3	2.4, 3.6	0.81	0.65, 0.96	1.11	0.90, 1.32	2.4	0.3	1.9, 3.0	0.75	0.58, 0.93	0.86	0.66, 1.05	
Stranger	0.9	0.1	0.6, 1.2	0.25	0.17, 0.32	0.29	0.20, 0.38	0.7	0.1	0.4, 0.9	0.21	0.13, 0.29	0.26	0.16, 0.36	
Abandoned/stray	1.5	0.2	1.1, 1.8	0.40	0.30, 0.50	0.55	0.41, 0.69	1.9	0.2	1.4, 2.4	0.60	0.45, 0.74	0.64	0.48, 0.80	
Gift	6.0	0.4	5.1, 6.8	1.61	1.39, 1.83	2.07	1.78, 2.35	1.7	0.2	1.2, 2.2	0.53	0.38, 0.67	0.54	0.39, 0.69	
Other sources	0.9	0.2	0.6, 1.2	0.25	0.16, 0.34	0.27	0.17, 0.36	0.6	0.1	0.3, 0.9	0.20	0.11, 0.29	0.22	0.12, 0.31	
	0.2	0.1	0.03, 0.3	0.04	0.01, 0.07	0.08	0.02, 0.13	0.3	0.1	0.1, 0.5	0.10	0.03, 0.17	0.10	0.03, 0.17	

Note. Numbers of HHs and animals are in millions. HHs could have added more than one animal during the year for different reasons. HHs = households.

added, and dogs that were abandoned or stray were the source for 11.8% of HHs and 9.0% of new dogs. Offspring of dogs already in the HH was the source of new dogs for 11.2% of HHs and 26.5% of new dogs, and 10.7% of HHs reported that they added a dog from a shelter, which represents 8.5% of new dogs.

Dogs and cats born in the HH were the most frequently reported source of new animals (34.4% of cats and 26.5% of dogs added). Compared to dogs, more than a million more cats were added to HHs by being born there or by being adopted as abandoned or stray cats. Compared to cats, almost a million more dogs came from breeders.

DISCUSSION AND CONCLUSIONS

To our knowledge, these are the first national estimates of the magnitude of, and reasons for, animals leaving HHs. These data are also the first estimates of birth-rates on a national basis. Approximately 1 million more cats than dogs died—or were killed—during this period. The crude death rate, based on all known deaths from all causes, was similar for cats and dogs at approximately 8% during 1996. Because, however, some of the animals that disappeared probably died or were killed, the crude death rate must be considered a minimum estimate. Because of the disproportionate number of cats who disappeared, the crude death rate for cats, in particular, must be considered an underestimate.

A large number of animals are dying each year by means other than euthanasia. This is true especially of kittens. This raises questions as to the causes and methods of these deaths, but such data were not collected in this survey. That more cats than dogs died, were killed, or disappeared may suggest less attention or concern by cat caregivers, in general, compared to dog caregivers. Caregiver expectations of cats (the assumption that it is a cat's nature to disappear for a few days and then return) also may explain some of this disparity. It would be valuable to know what efforts were made to find dogs and cats who disappeared and determine if these efforts differed by species, but these data were not collected. These findings, along with the estimate that almost a million more cats than dogs were given away, suggest that different values are being placed on these two species.

These data also suggest the fluid nature of the cat population, with many cats disappearing from some HHs and at least some being added to other HHs as abandoned or stray animals. This phenomenon has been suggested by others (Patronek, Beck, & Glickman, 1997) and complicates attempts to measure accurately the dynamics of this particular population. Whether this phenomenon reflects the basic nature of cats, perceptions or attitudes of caregivers, or a combination of the two plus other factors is an area that needs more study.

Although a similar number of kittens and puppies were born during 1996, important differences exist. The number of unplanned litters of kittens is disturbing

and justifies increased efforts aimed at promoting surgical neutering. That a large percentage of kittens born in HHs were of unknown sex (caregiver did not know the sex) may contribute to the cat surplus. Caregivers who intend to keep some of the kittens but also intend that the ones they keep are of the same sex may end up with additional unplanned litters. When combined with information on the disposition of kittens compared with puppies, the picture is bleaker. More kittens than puppies died or were given away, and, compared to puppies, fewer were sold. Furthermore, it must be remembered that these data are based on responses by people who admit to some relationship with the cats. We did not collect any data on the feral cat population and its dynamics in the United States.

The relative value of cats compared to dogs, as perceived by caregivers and society in general, has been a subject of some discussion. As early as 1904, Hall and Browne published data showing that dogs were considered much more manly than cats. Others have also identified differences between cat and dog caregivers (Kidd & Kidd, 1980; Perrine & Osbourne, 1998). These findings point to a need to consider strongly the human characteristics (knowledge, attitudes, expectations, experience) of cat and dog caregivers to understand better the dynamics that make some animals valued members of a HH and others only marginal and disposable members. Because these data were collected in 1997 on HHs with cats and dogs in 1996, they may not represent current situations in HHs. To estimate trends, replication of this study in some form would be necessary.

ACKNOWLEDGMENTS

This study was conducted under the auspices of the National Council on Pet Population Study and Policy. Funding was provided by American Animal Hospital Association, American Veterinary Medical Association, Humane Society of the United States, Massachusetts Society for the Prevention of Cruelty to Animals, PetsMart Charities, Colorado State University, and the University of Tennessee. We thank J. Karl Wise, Brad Gehrke, and Claire Louise Adams of the American Veterinary Medical Association Center for Information Management, and Arnold Saxton of the University of Tennessee Institute of Agriculture for their invaluable assistance with this project.

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