



Health Survey 2010

Elsa J. Sell, MD

January 5, 2011

General Information.....	4
Owner Demographics.....	4
Years in Breed.....	4
Dogs Owned.....	4
Location.....	5
Activities.....	5
Is the Breed Healthy?.....	6
Dog Demographics.....	6
Birth Years.....	7
Sex, Reproductive Status, and Breeding.....	7
Vaccination.....	8
Health Screening Tests.....	10
Dogs Bred, Number of Litters, Average Number of Pups/Litter.....	11
Bitches.....	11
Dogs.....	11
Disease Frequency by Category.....	12
Non-malignant warts, cysts, and lumps.....	12
Temperament.....	13
Skin and Hair/coat.....	14
Eye.....	14
Autoimmune.....	15
Cancer.....	15
Gastrointestinal Tract.....	17
Dietary.....	17

Mouth/Tooth	18
Ear.....	18
Muscle.....	18
Urinary Tract	18
Endocrine	19
Blood	19
Heart Problems	19
Infectious Disease.....	19
Neurological	20
Reproductive	20
Drug Or Toxicity Reactions	20
Liver or Spleen	20
Vaccine Reactions or Failures	21
Tissue Deformities.	21
Causes of Death	21
Cancer Deaths.....	21
< 4 years (n =10).....	21
4-8 years (n = 32).....	21
9-11 years (n = 40).....	22
12-13 years (n = 27).....	22
14 yr and > (n = 31).....	22
Mortality by Age Group	23
Comparison of Age Group Mortality in 2004 and 2010	23
Comparison of Cancer Mortality by Age in 2004 and 2010	24
Summary.	24
Persisting Problems	25
Vaccination Frequency.....	25
Use of Health Screening Tests in Breeding Dogs.....	25
Autoimmune Problems.....	25
Suggestions.	26
Appendix I. Additional Comparison Between 2004 and 2010 Surveys.	27
Disease Categories.....	27
Non-malignant Warts, Cysts, and Lumps.....	28

Temperament.....	29
Digestive System	29
Sex Distribution of Frequent Problems	30
Appendix II. AKC Litter/Puppy Registrations for 1995-2010.....	31
Appendix III. AKC Pup and Dog Registration	31
Appendix IV. AKC CHF CHIC Data (December 2010)	32
Appendix V. KBT CERF Research Report for 2004-2008	33
Appendix VI. Health Screening Tests in KBTs (from OFA web site - December 2010)	33
Appendix VII. Participant Comments.....	33

General Information.

The 2010 health survey is the second done by the KBTF; it was managed with Constant Contact Survey. The inclusion criterion was that the dog had been owned in the last five years. About 80 dogs' information was entered by volunteers; the others were entered on-line by owners. The survey period was May – October 2010. Survey questions were those of the 2004 survey with a few additional diseases.

Data were reviewed by John van den Bergh to clarify inconsistencies. This was done again during data analysis. Effort was made to glean additional information from the “other” and “comment” fields that were available in each disease category. However, those fields were sometimes used for disease categories other than the one it was intended for. There was no opportunity for owners to go back in the survey to correct a mistake or to add a disease. Thus, an occasional case may not have been properly counted. There is comparison of the 2004 and 2010 survey results when germane both in the main report and in several Appendices.

There were 691 dogs for general dog demographic data; only 656 marked as purebred were used for disease data analysis.

Owner Demographics.

There were 409 owners who provided information on 691 dogs. An additional 51 owners provided owner information only. Just the owners who provided dog information are included in owner demographics, except for views on whether the breed is healthy.

Close to 80% of owners had been in the breed for more than five years and it appears that owners now own fewer dogs than in the past.

Years in Breed

Years	Number Owners
1-5	79
6-10	111
11-15	88
>15	131

Dogs Owned

Number Dogs	Number Owners	
	Past Ownership	Current ownership
1	144	246
2	123	84
3	50	20
4	29	6
5	16	5

6-10	25	8
>10	22	1

Location. As in 2004, most owners were from North America. In 2004, 73.7% were from the US and 10.6% were from Canada. In 2010, 75.1% (#=307) were from the US and 12.1% (#=50) from Canada. Countries having five or more owners were Sweden (7), Australia (7), Finland (6), and the UK (5). Countries with fewer than five owners included Croatia, Czech Republic, France, Germany, Hungary, Ireland, Mexico, Netherlands, New Zealand, Northern Ireland, Norway, Panama, Russia, Scotland, South Africa, Spain, and Ukraine.

Within the US, there were participants from 41 states. States with 10 or more owners are listed below.

State	Number Owners
California	62
Florida	23
Pennsylvania	18
Texas	16
New York	12
Colorado	11
Arizona	10
Georgia	10
Maryland	10

Activities (past and/or present). These are from most to least frequent for the 2010 survey.

Activity	# Owners – 2010 (total 409)	# Owners – 2004 (total 274)
Companion	273 (68%)	240 (87%)
Obedience	102 (25%)	60 (25%)
Conformation	92 (23%)	85 (31%)
Agility	54 (13%)	58 (21%)
Breeding	45 (11%)	54 (10%)
Therapy	23 (8%)	39 (14%)
Rally	20 (5%)	NA
Herding	8 (2%)	14 (5%)
Tracking	7 (2%)	7 (3%)
Breeding and conformation	43 (11%)	50 (18%)
Conformation and obedience	41 (10%)	37 (14%)
Obedience and agility	34 (8%)	40 (15%)
Conformation and agility	24 (6%)	29 (11%)
Conformation, obedience, & agility	17 (4%)	21 (8%)
Conformation and therapy	7 (2%)	19 (7%)

Other activities were cycling, search and rescue, having CGC, hunting/pointing, foster and rescue work, service, greeter at winery tastings and events, and dock diving. The difference in activities between 2004 and 2010 may reflect changing interests of owners and venues available.

Is the Breed Healthy? Of the owners who submitted information on dogs, 374 (91.4%) believe the breed is healthy and 35 (8.6%) do not believe the breed is healthy. These figures are similar to the 2004 survey in which 84% believed the breed to be healthy. Of the 56 owners who did not submit dog information, 51 (91%) believed the breed is healthy. Even so, a lot of owners commented about a specific disease their dog had. The comments about breed health were enlightening and some conflicting with others; selected comments are below:

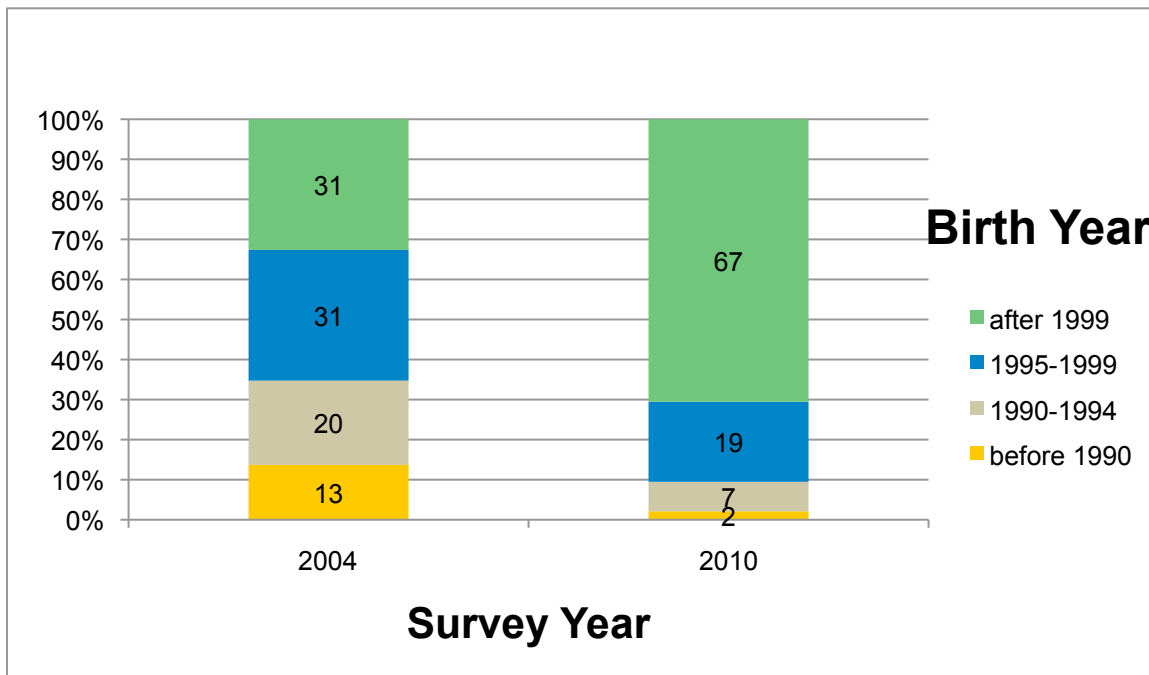
- It depends on the breeding
- I am on the fence here; have had 3 Kerries and 2 have been diagnosed with cancer
- Not true if you compare to other healthier breeds
- Yes when compared to other breeds
- Fairly healthy except for all the cancers that have started to show up
- A few of my dogs died of various cancers
- Had 2 Kerries previously that died of cancer (8 and 12); present Kerry is 13 and had leg amputation due to cancer
- It appears the breed has lots of moles and lumps
- Each of my 2 had disorders some have said are genetic
- Not a healthy breed. All 3 we've owned have had sebaceous cysts, two to a severe degree.
- My experience – healthy until around 8 years; last 2 had A/I problems before age 10
- All of ours had skin problems, sebaceous cysts, and one had skin tumors; another had Addison's, one acute glomerulonephritis, one kidney stones.
- 2/3 of ours had ongoing digestive problems; different 2 had allergies; different 2 had cancer
- 6/6 with sebaceous cysts, 3 had pancreatitis and IBD, 2 had more than 1 occurrence of cancer
- Constantly need to clean bumps on skin
- Not healthy due to inbreeding
- High health maintenance
- Healthy other than skin issues
- Our first had cancer and died at 10 yrs; some littermates died at 6 or 7
- Food allergies (several commented on this)
- Won't own another Kerry; had 2 from different breeders.
- 2/2 with severe diseases (not specified in comment section)
- Hard to know. I've spent more money on doctor visits, surgeries, etc. on this breed than any other.
- Many others commented about cysts and cancer
- There is very little tracking of health issues; just because we don't know doesn't mean they are healthy. Based on the list email, there is a lot of cancer
- Too many are bred to be aggressive

Dog Demographics

There were 516 (83%) living dogs and 163 (24%) deceased dogs; 12 were not marked as either living or deceased.

Birth Years. The same year groupings are used as for the 2004 survey. In the 2010 survey, 67% were born after 1999. About the same percent in both surveys gave no birth date or an impossible date (e.g., 2045); the latter dates were deleted during data clean up.

Birth Year	2010 - # (%)	2004 - # (%)
Before 1990	15 (2%)	73 (13%)
1990-1994	46 (7%)	108 (20%)
1995-1999	130 (19%)	169 (31%)
2000-2004	213 (31%)	168 (31%)
2005-2010	245 (36%)	-
Not specified	41 (6%)	23 (4%)



Sex, Reproductive Status, and Breeding. The average age for spaying or neutering was less than that in 2004 (22 mo. vs. 29 mo. for neutering and 23 mo. vs. 36 mo. for spaying). About half as many females were used for breeding prior to being spayed in 2010 as in 2004. The percentage of all dogs used for breeding were fewer in 2010; for 2004 it was 149/551 (27.0%) and for 2010 it was 140/656 purebred dogs (21.3%)

Sex	N (% of total)	Bred	Av Age S/N
M intact	172 (25%)	40/172 (23%)	
M neutered	197 (28%)	18/197 (9%)	22 mo (min 2; max 165)

F intact	115 (17%)	42/115 (36.5%)	
F spayed	207 (30%)	30/207 (15%)	23 mo (min 1; max 162)

Vaccination.

Vaccination Use	# (% of total)
Titers	33 (5%)*
Not vaccinated now	65 (9%)**
Yearly	369 (53%)
2-3 Year Interval	171 (25%)
3 Years	39 (6%)

*Although these dogs have titers done at present for some pathogens, several receive rabies vaccination per state law and some no longer are vaccinated but were previously; it is unknown how many dogs never received any vaccinations.

**Comments indicated that the not vaccinated option was selected sometimes for dogs which previously had received vaccines, but were not now being vaccinated at time of the survey due to disease, change in vet policy, or dog was “in between” routine vaccination.

Has vaccination frequency changed over time?

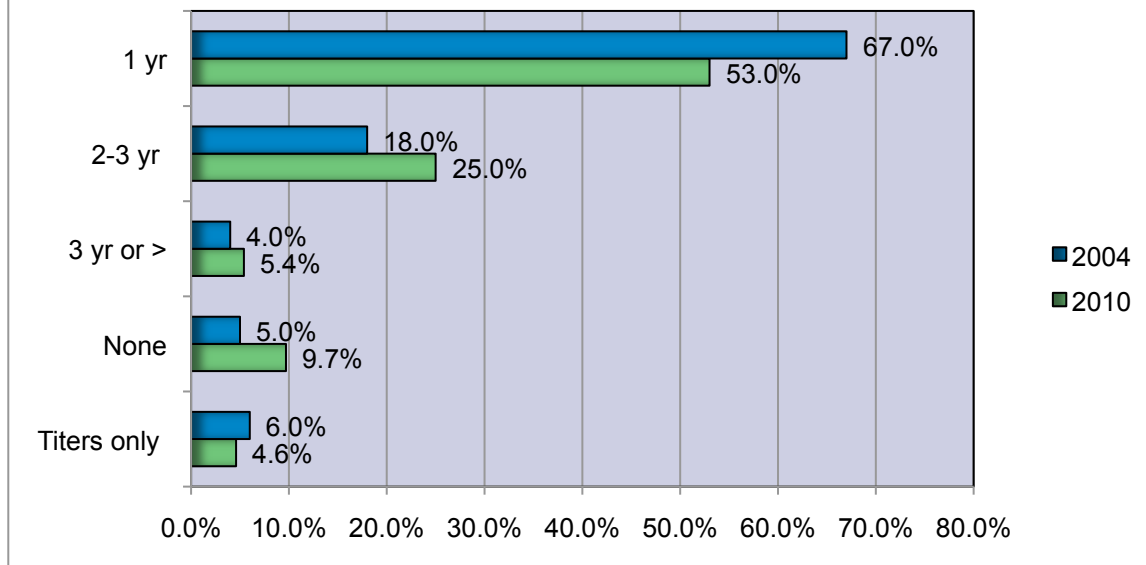
The first guidelines that core vaccines be given at three year intervals (unless required otherwise by law as with yearly rabies in some states) were published by the American Animal Hospital Association in 2004. Those guidelines were amended in 2006 and again in 2010 with no change for the distemper, adeno, and parvo vaccine intervals.

Since 84.3% of owners in the 2010 survey are from North America where the current recommendations are readily available to veterinarians, dogs from Canada and the United States with a known vaccination frequency were grouped by year when vaccination recommendations were made or amended. There was minimal increase in the number receiving vaccines at 3 years intervals in more recent birth years.

Vaccination Interval	Years of Birth		
	Before 2004 (n=246)	2004-2006 (n=127)	After 2006 (n=88)
Yearly	156 (63%)	79 (62%)	57 (65%)
2-3 Years	78 (32%)	40 (32%)	24 (27%)
3 Year or >	12 (5%)	8 (6%)	7 (8%)

When the 2004 and 2010 surveys are compared (see chart on next page), there is a little change in 2010 with fewer getting yearly vaccinations and more having vaccination at 2-3 year interval. Still there was no increase in the percent vaccinated at 3 year interval or greater.

Comparison of Vaccination Frequency



Some listing no vaccination or titers had been vaccinated when younger, prior to disease onset, or prior to having a vaccine reaction. Immunologists believe that vaccination can trigger A/I disease in the genetically predisposed dog. The category of A/I diseases was 14.9% of all dogs (it was 9% in 2004). That frequency and the fact that only 6% received vaccines at 3 year intervals, suggest that the subject merits educational efforts.

Parasite Control. There was no list of preventives for owners to select from in the survey. Thus, a hand tally was necessary. One or more preventives were used for 570 dogs (82%) and the identity of the preventive(s) was given for 494 dogs.

The main flea and tick products were:

- Frontline – 109
- Frontline Plus – 53
- Advantix – 40
- Program – 30
- Advantage – 19

The main heartworm preventives were:

- Heartgard – 103
- Interceptor – 32
- Sentinel – 22 (also provides flea control)
- Heartgard Plus – 13

A few listed Ivermectin; owners need to be aware that livestock preparations of Ivermectin are not approved for use in dogs. They are much more concentrated and great care must be taken to assure

proper dilution or serious toxicity could result. Please be very careful if you chose this kind of product and have your veterinarian supervise the dilution and use.

Health Screening Tests

Frequency of health screening tests was calculated for two groups - all dogs and for those used in breeding.

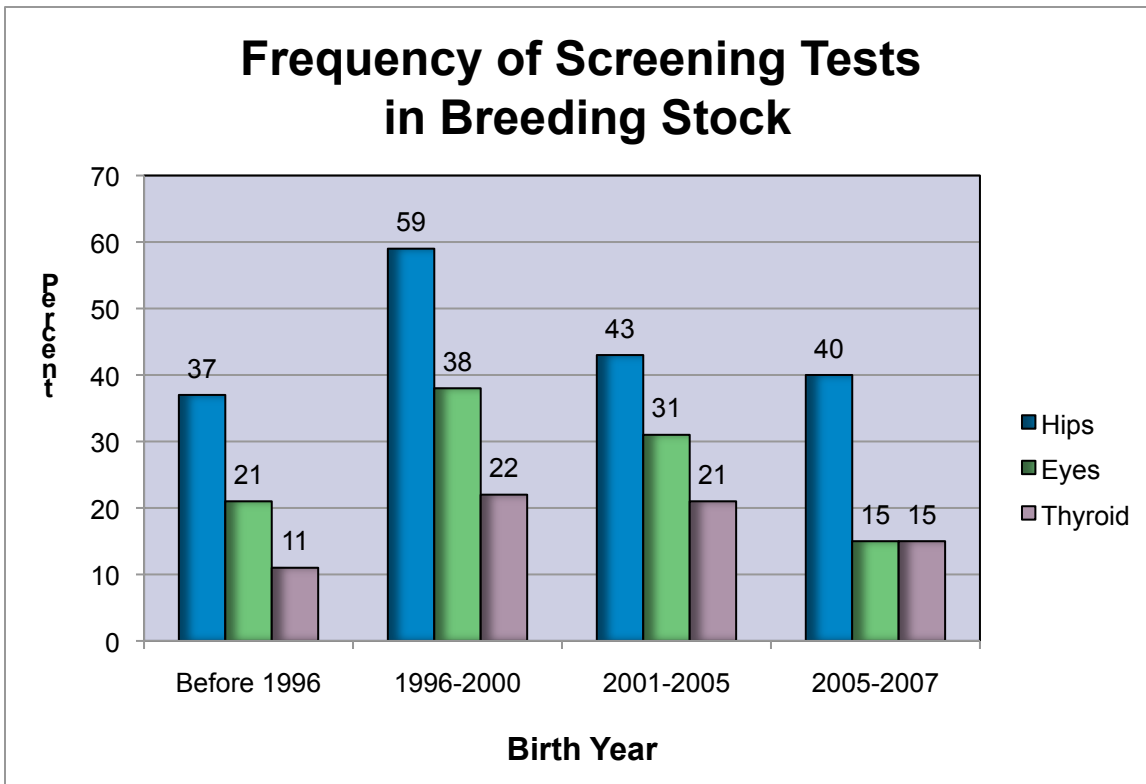
Health Screen	All dogs (n=691)	Breeding (n=140)
Hips	173 (35%)	62 (44%)
Eyes	133 (19%)	40 (29%)
Thyroid	107 (16%)	25 (18%)
Elbow	47 (6.8%)	15 (11%)
vWD	19	10
Factor XI	8	2
Heart	4	3
Degenerative myelopathy	2	1
Hips & eyes	111 (16%)	39 (28%)
Hips, eyes, & thyroid	61 (9%)	22 (16%)

Health Screening Tests in Breeding Dogs.

While use of hip and eye health screens was higher among breeding dogs, it was not even at 50% for any single test or combination of tests. The number and percentage of health screening tests would be expected to increase over time concomitantly with increasing awareness of official organizations' (e.g., CERF, OFA) recommendations and KBTF participation in the AKC CHF CHIC program from 2002-2009. The table (showing number of dogs) and graph (showing percentage of dogs) suggest otherwise. Of the 139 dogs used for breeding, 70 were from the United States; of these, 28.5% had a CERF exam.

The table below is for breeding dogs regardless of geographic location.

Health Screen	Birth Year			
	1995 and before (n=19)	1996-2000 (n=32)	2001-2005 (n=61)	2005-2007 (n=20)
Hips	7	19	26	8
Eyes	4	12	19	3
Thyroid	2	7	13	3
Hips & eyes	4	12	18	3
Hips, eyes, & thyroid	2	5	12	3



Dogs Bred, Number of Litters, Average Number of Pups/Litter Bitches

81 were identified as having been bred; 17 had no litter information (were rescues or current owner didn't breed or litter due soon). That gave 65 bitches with available litter information. Three had no puppies.

Litter #	# Bitches	Av # pups
1	62	4.3
2	28	5.9
3	9	4.3
4	4	4.0
5	0	-
6	1	4

Dogs

55 were identified as having been bred; 1 had a comment "none" taken to mean no litters; 8 were rescued or obtained after breeding was completed and no information was available. This gave 46 dogs used at stud for which litter information was available.

Litter #	# Dogs	Av # pups
1	46	5.0
2	26	4.8
3	12	4.9
4	8	5.1
5	5	5.2
6	4	6.5
7	2	6.0
8	2	6.0
9	2	6.0
10	2	6.0

Disease Frequency by Category

Only purebred dogs (n=656) were used to analyze the disease and clinical sign data. There was no field for the owner to check if the dog was completely healthy, so a hand tally of dogs was done and only 17% were completely healthy with 541 dogs (83%) having one or more diseases, or clinical signs. The large number of reported problems suggests that the effort to gain participation was met with enthusiasm. As will be seen, the same health issues lead the list in both 2004 and 2010. Although it is not known whether frequency of disease problems in this survey population is representative of the general population of KBT's, nevertheless the dominance of several problems over time warrants a search for solutions.

Here is a guide to the disease reporting:

- Disease categories are presented in decreasing order of frequency.
- Within each category, frequency of disease or clinical sign is shown if it occurred in 1% or more of all dogs.
- Less frequently occurring issues are listed after each table.
- Disease frequency was not calculated if comments suggested the diagnosis might be incorrect. Instead there is a dash "-" in the frequency columns. Please read comments after each section for explanation.

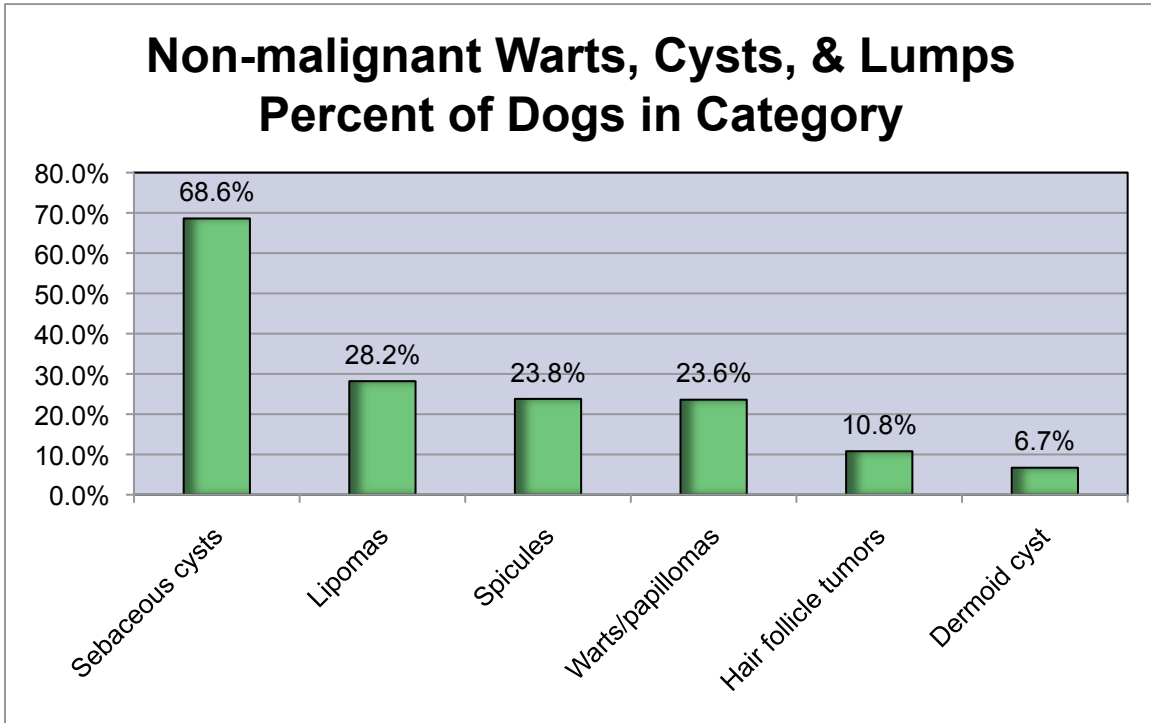
Non-malignant warts, cysts, and lumps

problems = 583; # dogs = 344 (52.4% of all dogs)

Disease	#	% of All Dogs	% of Dogs in Category
Sebaceous cysts	236	36.0%	68.6%
Lipomas	97	14.8%	28.2%
Spicules	82	12.5%	23.8%
Warts, papillomas	81	12.4%	23.6%
Hair follicle tumors	37	5.6%	10.8%
Dermoid cyst	23	3.5%	6.7%
Mammary gland adenoma	11	1.7%	3.2%

Histiocytoma and hemangioma 8 each.

Not only did dogs have multiple problems in this category, some had more than one occurrence of a disease. As in 2004, this category is the most frequent; those diseases which cause the most trouble for dog and owner deserve more detailed scrutiny. There was minimal sex difference for sebaceous cysts (male 115; female 121) and no difference for spiculosis (male 42; female 40).



Temperament

problems = 293; # dogs = 207 (31.6% of all dogs)

Problem	#	% of All Dogs	% of Dogs in Category
Excitable	84	12.8%	40.6%
Aggression	44	6.7%	21.3%
Fearful	39	5.9%	18.8%
Passive	28	4.3%	13.5%
Shy	26	4.0%	12.6%
Unstable (unpredictable)	11	1.7%	5.3%

Other diagnoses were: lethargy and irritable 4 each. 53 dogs were checked as “other” problems; except for 5 with separation anxiety it isn’t possible to categorize these easily based on the comments; some with “other” problems also had specific problems checked.

The conundrum with temperament problems is whether these are of concern for the breed. Are the characteristics natural for the breed? How and when does the environment shape temperament? Could there be physiological explanation? Although the nature vs. nurture debate can’t be answered, it is possible to determine if there is a physiological explanation. For example, some dogs of other

breeds with symmetrical lupoid onychodystrophy (a chronic nail condition associated with painful loosened nails) can become quite aggressive during the acute phase of the disease. So, for the aggressive KBT's, was there an underlying disease causing pain? Another example of physiologic explanation for behavioral issue, is the association of aggression or excessive fearfulness with hypothyroidism with resolution of the behavior in many dogs after treatment (Jean Dodds – <http://www.canine-epilepsy-guardian-angels.com/behaviorandthyroid.htm>)

Skin and Hair/coat

problems = 238; # dogs = 160 (24.4% of all dogs)

Disease or sign	#	% of All Dogs	% of Dogs in Category
Spiculosis	82	12.5%	51.3%
Poor, dry, or thin coat	25	3.8%	15.6%
Chewing or biting at skin or coat	22	3.4%	13.8%
Dietary allergy	17	2.6%	10.6%
Hot spots	16	2.4%	10%
Pruritis	15	2.3%	9.4%
Allergic skin disease	14	2.1%	8.8%
Contact allergy	14	2.1%	8.8%
Flea allergy	10	1.5%	6.3%

Other diagnoses included dermatitis 8; hair loss, lick granuloma, demodectic mange, 3 each; sarcoptic mange, atopy 2 each; bacterial hypersensitivity and yeast infection 1 each

There were no cases of depigmentation, other mange, pemphigus (although there were 13 cases checked in the A/I category).

Since one of the clinical signs of hypothyroidism is a poor coat (thin, dry) this is a diagnosis that should be ruled out. Only 3 of the 25 with poor coat were hypothyroid; it is not known if the other 22 had thyroid levels checked.

Eye

problems = 147; # dogs = 128 (19.5% of all dogs)

Disease	#	% of All Dogs	% of Dogs in Category
Conjunctivitis	68	10.4%	53%
Keratoconjunctivitis sicca (KCS)	35	5.3%	27.3%
Cataracts	21	3.2%	16.4%
Distichiasis	8	1.2%	6.3%

Glaucoma 5, entropion 3, ectropion 4, corneal dysplasia, uveitis, and progressive retinal atrophy 1 each (onset before age 1, now totally blind).

In cases where age was given, cataracts and glaucoma were of older age onset. Among dogs with cataracts for whom age of onset was given (n=11) were 9 years or older. Nine of 35 checked having KCS were using treatment for the condition or commented that KCS was the diagnosis. Ascertaining if KCS is a significant problem in the breed will take more focused collection of clinical information.

Autoimmune.

problems =141; # dogs = 98 (14.9% of all dogs)

Disease	#	% of All Dogs	% of Dogs in Category
Thyroid	35	5.3%	35.7%
Uveitis	24	-	-
Pemphigus	13	2.0%	13.3%
Rheumatoid arthritis	12	-	-
Degenerative Myelopathy	11	-	-
Chronic active hepatitis	9	1.4%	9.2%
Immune suppression*	7	1%	7.1%

*3/7 immune suppression cases had another A/I disease checked (1 uveitis and Addison's, 1 uveitis, 1 AIHA, rheumatoid arthritis, and chronic active hepatitis).

Other diseases were: SLE (5, coded under kidney A/I problem), AIHA (5), immune suppression (with no other A/I diagnosis given) and Addison's (4 each), and diabetes mellitus, AITP, and hypoparathyroidism (2 each); Cushings (1) (see Endocrine Disease for additional cases). There were no cases of myasthenia gravis or myositis.

Age of onset:

- Hypothyroid – av 7.2 yr (n=15; min 2.5 yr; max 12 yrs)
- Addison's – 9 yr (one case)
- Uveitis – 2, 5, 9, 6 yrs.
- AIHA – 2, 5, and 10 yrs; 1 of those during pregnancy
- Degenerative myelopathy – 1, 8 yrs

Other observations.

- It is likely that not all rheumatoid arthritis cases are that diagnosis because two comments indicated older age onset of arthritis and rheumatoid arthritis generally is younger age onset.
- The 5 SLE cases are probably not all SLE. For example, two had older age of onset (one had kidney failure at 15 ½ years, another 11 years of age) and one had kidney failure secondary to Lyme disease. In no case was there comment about how SLE was diagnosed.
- Several cases of uveitis are questionable; two commented that the dog had occasional eye infections and one commented that the dog had inverted eyelids. Without more detail it is impossible to know if the infections or inverted eyelids were the only eye diagnosis or accompanied uveitis.
- At least two cases of degenerative myelopathy had comments suggesting that the dogs don't have the disease; one was a degenerative myelopathy carrier and the other was a PNA carrier.
- It is unknown whether all thyroid problems were autoimmune.
- Eleven cases of DM were reported in 2010 and 12 cases, in 2004. With a DNA test available for degenerative myelopathy the problem should decline in frequency and eventually be eliminated.

Cancer

problems = 127; # dogs affected = 105 (16% of all dogs)

Disease	#	% of All Dogs	% of Dogs in Category
Lymphosarcoma, lymphoma	26	4.0%	25%
Mammary	16	2.4%	15.5%
Squamous cell sarcoma	14	2.1%	14%
Malignant melanoma	11	1.7%	10.7%
Bladder	10	1.5%	9.7%
Stomach	9	1.4%	8.7%
Lung	7	1.1%	6.8%

Other cancers were: Liver 6; bowel and hemangiosarcoma 5 each; Osteosarcoma, spleen, leukemia, and mast cell 3 each; heart, kidney, testicular, thyroid, non-malignant melanoma and uterine 1 each. There were no cases of ovarian cancer. Some cases were only suspected by veterinarian to involve the organ marked; only one had an autopsy.

Multiple Cancers. Fifteen dogs (14.3%) had two or more cancers, some of which may have been metastatic from a primary. The combinations listed below happened in one dog, with a single exception which is noted. Lymphoma includes lymphosarcoma.

- Lung, liver, toe
- Lymphoma, liver, thyroid
- Bladder, lung
- Osteosarcoma, mammary
- Lymphoma, squamous cell
- Lymphoma, leukemia
- Bowel, stomach
- Malignant melanoma, squamous cell, stomach
- Lymphoma, bowel, stomach
- Spleen, heart
- Mammary, stomach
- Malignant melanoma, mammary
- Liver, bowel
- Lymphoma, malignant melanoma (two dogs)

In cases of multiple cancers in a single dog, there is insufficient information to know if a cancer location was primary or metastatic, except for 1 case of lung cancer that was metastatic from mammary cancer.

Age of Cancer Onset was given for 23 (22% of dogs with cancer).

- Lymphoma, lymphosarcoma – 7, 10, 11, 11 ½, 12 yr
- Mammary – 5, 5, 9, 10 yr
- Squamous cell sarcoma – 5, 9, 15 yr
- Malignant melanoma – 2, 8, 10 yr
- Bladder - 4, 10, 11, 11, 12 yr

Osteosarcoma – 5 yr
Kidney – 9 yr
Stomach – 9 yr

Since age of diagnosis was available in just 22% and 13/23 were 9 years or older, it is unclear from this set of data whether early onset cancers are a problem in the breed. However, better insight comes from the mortality data starting on page 20 which shows that cancer was the leading cause of death in all age groups except those over 14 years of age.

Gastrointestinal Tract

problems = 188; # dogs = 126 (19.2% of all dogs)

Disease	#	% of All Dogs	% of Dogs in Category
Recurring diarrhea	43	6.6%	34.1%
Flatulence	35	5.3%	27.8%
Recurrent vomiting	35	5.3%	27.8%
Acute diarrhea	28	4.3%	22.2%
Chronic colitis (IBD)	22	3.4%	17.5%
Chronic diarrhea	8	1.2%	6.4%
Anal gland infection	8	1.2%	6.4%

Chronic gastritis (6), persistent vomiting (3). There were no cases of megaesophagus or bloat.

Dietary

problems = 113; # dogs = 108 (16.5% of all dogs)

Problem	#	% of All Dogs	% of Dogs in Category
Food Hypersensitivity	55	8.4%	50.9%
Food Intolerance	38	5.8%	35.2%

Among other dietary problems were: picky eater (3), loose stools (3), IBD (2), food allergy (1), copper storage disease (1). Picky eating and loose stools were common in those with food hypersensitivity too. The hypersensitive dogs were unable to tolerate various ingredients from grains to different meat sources to commercial kibble (several of the latter were on novel protein source kibble which suggests IBD as a diagnosis but which had not been checked). Some with food hypersensitivity also had skin manifestations of allergies.

GI Combo

For purposes of comparison with the 2004 survey, the same grouping of gastrointestinal diseases or clinical signs was created. It included:

- Food hypersensitivity (n=55)
- Food intolerance (n=38)
- IBD (n=22)
- Recurrent vomiting (n=35)

- Recurrent diarrhea (n=43)

This grouping resulted in 145 dogs or 22.1% of all dogs; some had more than one issue. These data are shown in the graph on page 25.

Mouth/Tooth

problems = 221; # dogs = 140 (21.3% of all dogs)

Disease	#	% of All Dogs	% of Dogs in Category
Halitosis	66	10.1%	47.1%
Dental tartar	57	8.7%	40.7%
Missing teeth	46	7.0%	32.9%
Gingivitis	15	2.3%	10.7%
Tooth abscess	12	1.8%	8.5%

Other diagnoses were: retained puppy teeth and overshot 6 each, undershot 5, epulis/gum growth 3, cancer 2, crooked lower teeth, Gemini tooth, broken tooth 1 each. There were no cases of wry mouth. Some dogs experienced multiple mouth/tooth problems, the most common being halitosis and dental tartar (18); halitosis and gingivitis (10).

Ear

problems = 106; # dogs = 101 (15.4% of all dogs)

Disease	#	% of All Dogs	% of Dogs in Category
Chronic ear infections	69	10.5%	68.3%
Deafness	29	4.4%	28.7%

There were 2 cases of ear vasculitis and 1 case of aural hematoma. All but one case of deafness were age related (i.e., older dogs) which is a normal aging phenomenon.

Muscle

problems = 84; # dogs = 77 (11.7% of all dogs)

Disease	#	% of All Dogs	% of Dogs in Category
Trembling, tremors	54	8.2%	70.1%
Degenerative myelopathy	11	1.7%	14.3%
Weakness	10	1.5%	13%
Twitching	9	1.4%	11.7%

As noted in the A/I category, all cases of degenerative myelopathy may not be that diagnosis. There were no cases of myasthenia gravis or myopathy. Whether trembling or tremors is clinically important is not known.

Urinary Tract

problems = 69; # dogs = 65 (9.9% of all dogs)

Disease	#	% of All Dogs	% of Dogs in Category
Incontinence	15	2.3%	23.1%
Kidney disease	14	2.1%	21.5%
Bladder stones	14	2.1%	21.5%
Cystitis	11	1.7%	16.9%

Other cases included crystals 6, kidney stones 5, vaginitis and prostate disease 2 each. Kidney disease included glomerulonephritis (1), and associated with Lyme disease, Leptospirosis, or Addison's (1 case each). There were no cases of nephritis.

Endocrine

problems = 56; # dogs = 51 (7.8% of all dogs)

A number of these problems are also listed in the A/I Category

Disease	#	% of All Dogs	% of Dogs in Category
Hypothyroidism	35	5.3%	68.6%
Pancreatitis	8	1.2%	15.7%

Less frequent diagnoses were: Cushing's (5), Addison's (4), diabetes mellitus and hypoparathyroidism (2 each). There were no cases of prostatic disease. Three cases of pancreatitis were in dogs 8 years or older.

Blood

problems = 32; # dogs affected = 31 (4.7% of all dogs)

Disease	#	% of All Dogs	% of Dogs in Category
Lymphoma, lymphosarcoma	26	4.0%	83.9%

Other diagnoses were: AIHA and von Willebrand's Disease, factor XI deficiency 4 each, leukemia 3, AITP 2, myeloma 1. There were no cases of bone marrow failure, SLE (though 5 cases of SLE were checked under kidney A/I problem), or hemophilia.

Heart Problems

problems = 22; # dogs = 22 (3.4% of all dogs)

Nineteen dogs (2.9% of all and 86.4% of the category) had a heart murmur. There were 3 cases of heart failure with no identified primary cause. There was no cardiomyopathy or subaortic stenosis. No structural cause for the heart murmurs were mentioned, though one had a hole in the heart repaired surgically. Unless one has a diagnostic cause for a heart murmur it isn't possible to know if there are underlying developmental lesions or later onset poor cardiac function, or loss of valve function.

Infectious Disease

diseases = 37 (note: non-diagnostic cases are not included in this number – e.g., "bacterial"); # dogs = 51 (7.8% of all dogs)

Disease	#	% of All Dogs	% of Dogs in Category
Lyme disease	16	2.4%	31.4%
Giardia	14	2.1%	27.5%

There were 12 bacterial, 4 acute, 2 chronic, 2 viral, 2 fungal, 5 coccidia, and 2 leptospirosis cases. There were no cases of mycoplasma or heartworm.

The diagnosis of Lyme disease suggests the need for increased vigilance and regular inspection of a dog's coat for ticks even when tick preventives are in use. If tick preventives are not being used, owners should review this with their veterinarian. Knowing where Lyme disease is most prevalent helps decision making. The states of PA, NY, MA, CT, RI, MD, and WI had the largest number of human cases of Lyme disease reported for 2002-2004. This link shows the number of cases for 2009 - http://www.cdc.gov/ncidod/dvbid/lyme/ld_incidence.htm).

Neurological

problems = 62; # dogs = 47 (7.2% of all dogs)

Disease	#	% of All Dogs	% of Dogs in Category
Seizures	16	2.4%	34.0%
Tremors	13	2.0%	27.7%
Hyperexcitability	10	1.5%	21.3%

Other diagnoses were twitching and vaccine reaction 6 each, epilepsy 3, PNA 2, single other cause 6. There were no cases of fainting.

Reproductive

problems = 44; # dogs = 35 (5.3% of all dogs)

The following diagnoses were reported: false pregnancy 9; pyometra 7; vaginitis 6; abnormal heat cycles, cryptorchid, and monorchid 4 each; stillborn puppies, infertility, sterility, and poor libido 2 each; abortion (also poor libido) and metritis 1 each. There were no cases of anestrus, hermaphroditism, or vaginal strictures.

Drug Or Toxicity Reactions

These were very infrequent with 18 events in 15 dogs with the following drugs or toxins – plants (7), corticosteroid (3), Sentinel and Acepromazine (2 each), and Program, Rimadyl, Rodenticide poison, and Slug bait (1 each).

Liver or Spleen

These were very infrequent with diagnoses in 14 dogs. There were 9 cases of chronic active hepatitis (also listed in A/I category), 5 liver failure, 5 hemangiosarcoma (also listed in cancer category), and 1 each cirrhosis, acute hepatitis, and splenomegaly. Some dogs had several problems.

Vaccine Reactions or Failures

These were reported in only 11 dogs. Three had anaphylaxis, 1 developed AIHA after rabies, parvo, & distemper shots, and 1 developed pancreatitis and IBD within 2 weeks of shots (also had anesthesia for neutering in that time frame).

Tissue Deformities.

Only 7 cases were reported; 4 umbilical hernias and 2 inguinal hernias. There were no cleft palates. The other case was a fat nodule on the umbilicus.

Causes of Death

Age groups for mortality are generally the same as for the 2004 survey to allow for comparison between surveys; the oldest dogs were divided between 12-13 yr and 14 yr and over for the 2010 survey. There were 163 deaths (23.6%); 19 had no date of death (or an implausible date of death and/or birth); 4 with dates of death had no date of birth. Thus, there were 140 dogs for which age at death was calculated. Necropsy was done on 12 dogs.

Cancer Deaths.

Cancer was the leading cause of death in all age groups except 14 yr and older. This includes those who were suspected to have had cancer or with an unidentified primary site, so the numbers might be falsely high.

- Before 4 years of age – 40%
- 4-8 years – 62.5%
- 9-11 yr – 41.9%
- 12-13 yr – 48.1%

Considering cancer deaths in all dogs (even those with no date of death), there were 77/163 (47.2%). Only 67 of these cases had date of death listed and could be placed into one of the mortality age groups.

< 4 years (n =10)

- 4 Cancer (leukemia & tested + for Ehrlichiosis, Cushings due to tumor in adrenal gland, hemangiosarcoma, bladder)
- 2 Aggression
- 2 AIHA
- 1 each – heart disease and Leptospirosis

4-8 years (n = 32)

- 20 cancer
 - 5 lymphoma
 - 3 prostate
 - 2 mammary
 - Others were either unidentified primary site or single cases

- 1 each accidental, dog fight related injuries, degenerative myelopathy, acute respiratory distress, protein losing enteropathy, unknown (possible A/I), renal failure, aggression, glomerulonephritis, chronic nasal inflammatory disease, immune problem associated with loss of facial muscles and inability to eat, lymphangectasia

9-11 years (n = 40)

- 27 cancer
 - 6 unspecified
 - 3 lymphoma
 - 2 each lungs and bladder (1 also involved liver)
 - Others were single cases – e.g., face, brain, melanoma
- 2 each heart failure, degenerative myelopathy, unknown
- 1 each old age, heart attack, kidney failure, liver failure, massive infection, meningitis, possible PNA (no testing)

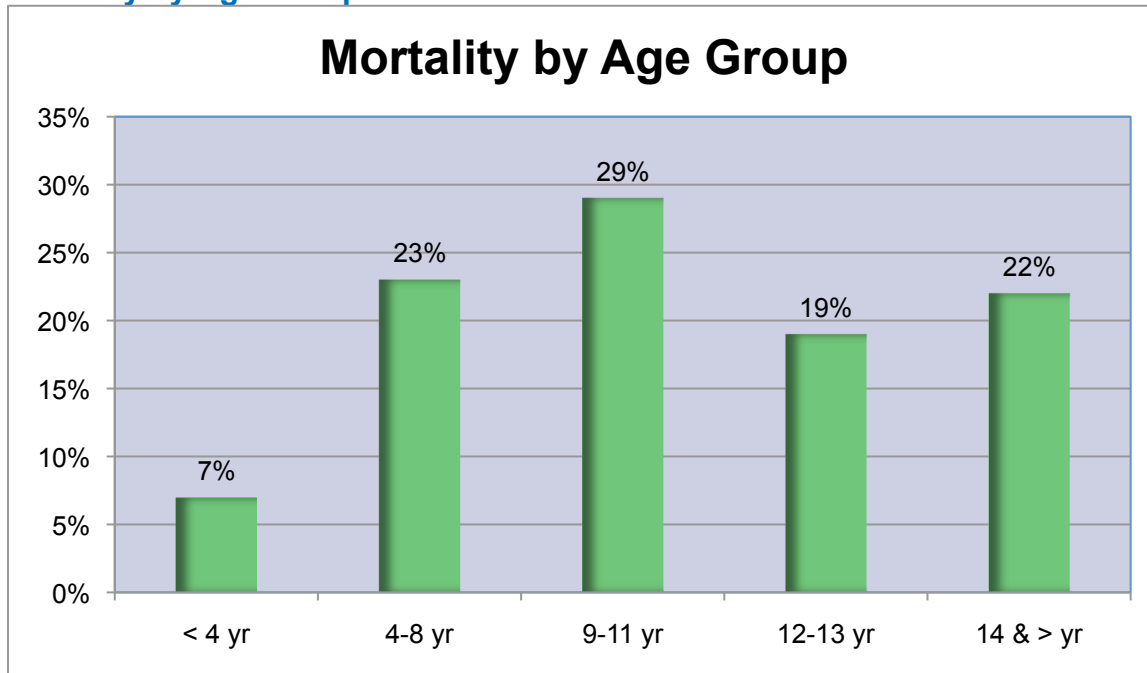
12-13 years (n = 27)

- 13 cancer
 - 2 each brain, mammary
 - Others unidentified
- 4 unknown or not specified
- 2 each liver failure and kidney failure
- 1 each heart failure, paralysis of hind legs, seizures, pancreatitis, lost bowel function after killing skunk, lung *E. coli* infection

14 yr and > (n = 31)

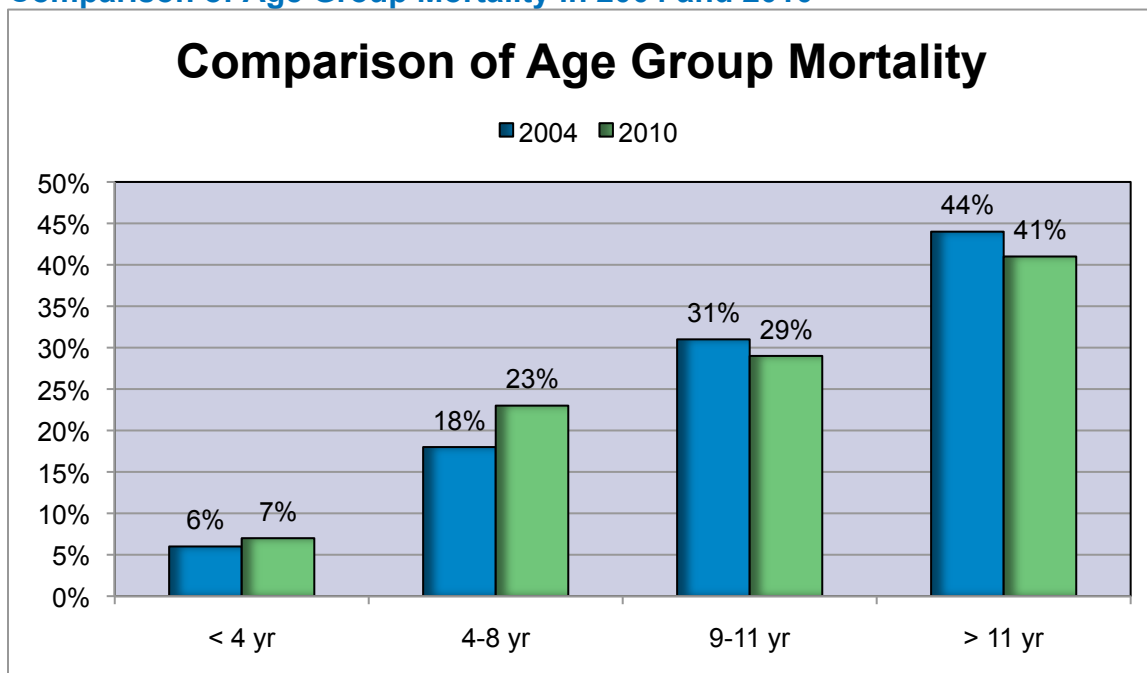
- 13 old age
- 5 seizures or stroke
- 4 kidney failure
- 3 cancer
- 1 each drowning, Addison's, intractable bleeding from nose & head, systemic infection and heart failure, possible meningitis, congestive heart failure

Mortality by Age Group

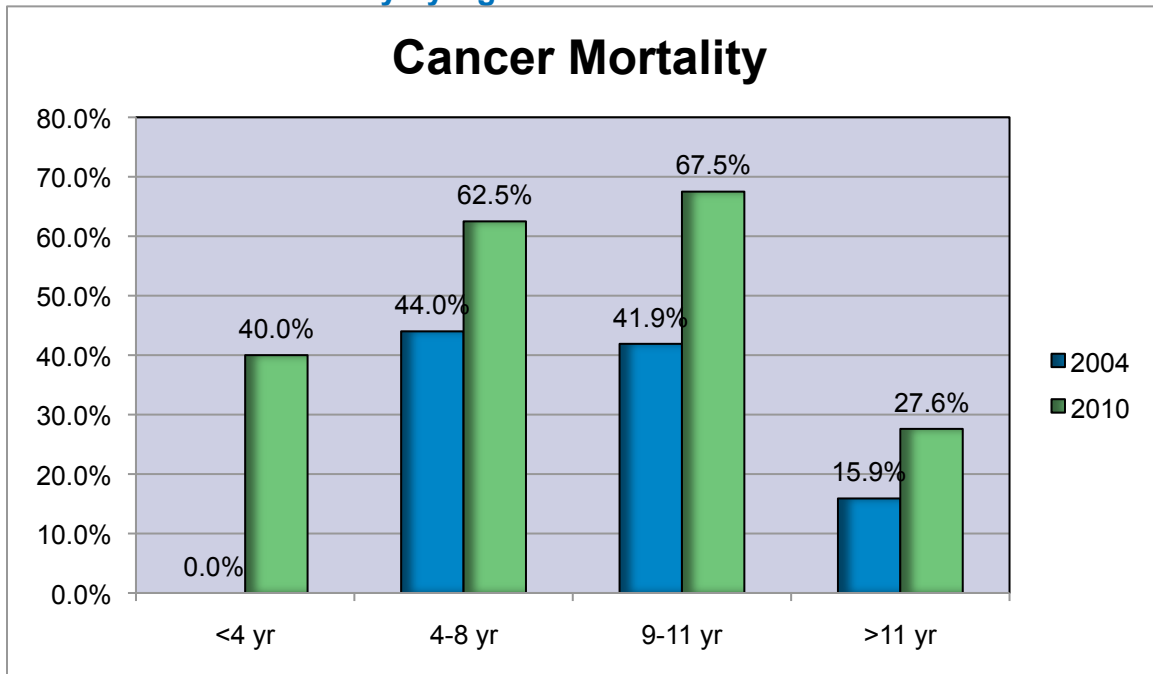


The age group mortality rates were very similar between the 2004 and the 2010 surveys as seen in the chart below.

Comparison of Age Group Mortality in 2004 and 2010



Comparison of Cancer Mortality by Age in 2004 and 2010



All age groups had a higher cancer mortality rate in the 2010 survey. Whether this represents a true increase in cancer in the breed or greater motivation to report cancer mortality is not known.

Summary.

The Kerry Blue Terrier Foundation 2010 Health Survey will have several benefits. The effort in planning and doing the survey has resulted in documenting again that certain health issues are persistent in the breed. It offered participants the opportunity to voice their opinion based on their own experience. While there was greater participation in both number of owners and dogs in 2010 than in 2004 and while one always wishes to have had greater participation, you take what you have and run with it.

A number of owners offered up their view about health of the breed and specific areas of concern. The survey findings buttress owners' concerns regarding both causes of morbidity and mortality. The most frequent disorders causing morbidity or mortality probably deserve first consideration of research efforts because of the number affected. This is especially true in view of the declining numbers of litters since 2005 (as assessed by AKC registration statistics). Several areas for educational efforts include vaccination schedules, health screening tests for breeding stock, and definition of disease conditions.

It is quite possible that the Foundation Board will see other problems equally or more deserving of attention.

Persisting Problems

The most frequent disease categories relate to skin problems, temperament, eyes and possibly, autoimmune. Although these problems are not usually lethal, they present significant morbidity for the owner to deal with and thus deserve attention.

The major health problem in terms of mortality is cancer. For dogs less than 9 years, cancer accounted for 57% (24/42) of the deaths. For dogs less than 12 years, cancer accounted for 62% (51/82) of deaths.

The 2004 and 2010 KBTF surveys identified health concerns similar to those found in a USKBTC survey in 1999. The latter survey had 94 respondents from 1960-1989 and 204 respondents for 1990-1999. The similarity of reported health problems exists even though the KBTF surveys report individual dog diseases while the USKBTC survey reported information as a percentage of respondents. In the USKBTC survey, skin disorders (sebaceous cysts, spiculosis, warts in descending order) were reported by over $\frac{3}{4}$ of respondents. Thus, certain problems have persisted over decades.

Vaccination Frequency

Immunologists believe that vaccination can be a trigger to A/I disease in the genetically predisposed dog. Although there is uncertainty about some of the diagnoses, A/I disease category occurred in 14.9% of all dogs (it was 9% in 2004). That frequency and the fact that apparently only 6% are receiving vaccines at 3 yr intervals indicate that the subject merits educational efforts.

Use of Health Screening Tests in Breeding Dogs

Lack of using available health screening tests for breeding dogs doesn't necessarily mean that progeny will have a preventable health problem. But the lack of health screening for breeding dogs participating in these surveys happened in both surveys. This is also apparent in the AKC CHF CHIC program participation and for the most recent CERF research report years. The rate of screening test use may be an anomaly related to which breeders chose to participate in the surveys, CHIC, or CERF. The OFA KBT health testing data show a low frequency of abnormal results for hips, thyroid, and elbows (though not for degenerative myelopathy which was 10%). Some may believe that such a low frequency of abnormal screening tests means there is nothing to worry about. That belief has to be proven before breeders can be complacent.

Autoimmune Problems.

This category was the fourth highest. However some of those diagnoses are uncertain. Hypothyroidism should be only classified as autoimmune if there is laboratory proof of autoantibodies to one or more thyroid hormones. Those autoantibodies will be found in the younger dog when the autoimmune disease is active and thyroid destruction is ongoing. If a dog is first tested for hypothyroidism when it is 9 or 10 years old, that is long past the time to find autoantibodies.

It was pointed out in the main report that some diagnoses may not be accurate for rheumatoid arthritis, degenerative myelopathy, and uveitis. If it is decided to focus on this category of problems, a new survey (or a registry – see suggestions) with clear definition of how a diagnosis is made and a request for veterinary documentation of the health problem would be essential.

Suggestions.

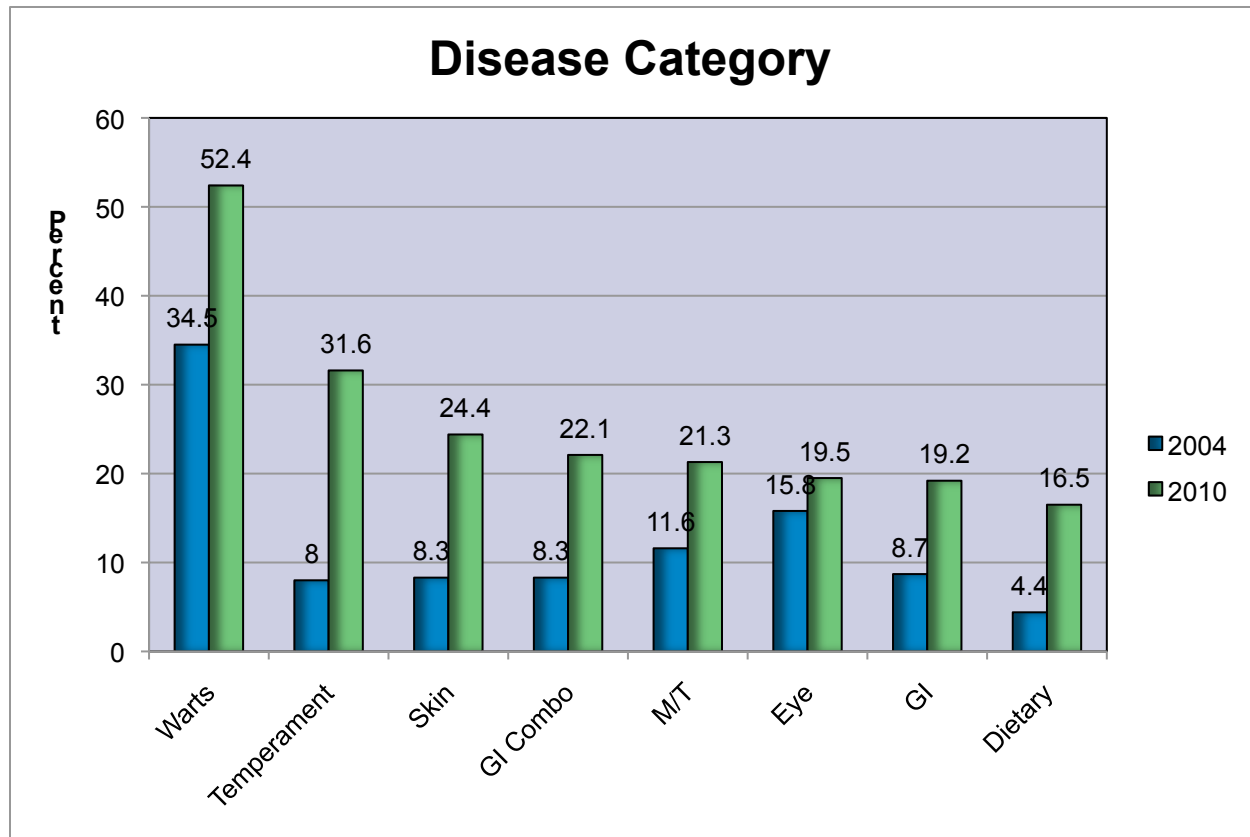
1. Decide whether to address health maintenance topics (e.g., vaccination schedules), the most troublesome morbidities, cancer, or health screening tests for breeding dogs. Although schisms no doubt exist among the breed organizations, perhaps these topics could become the pivotal point of a shared effort.
2. Contemplate instituting an on-line health registry (either general or for specific diseases) for long term tracking of diseases. A major decision would be whether to offer the registry as open or closed, at the option of the dog's owner.
3. For future surveys and/or an on-line health registry.
 - a. For a survey, use a more flexible survey tool to facilitate participation (make it easy) and that allows the owner to go back to correct mistakes or enter additional information.
 - b. Limit the effort to issues determined to be significant, either from the perspective of morbidity, frequency, 2010 participant comments, or early mortality.
 - c. Obtain owner contact information so that ambiguous answers can be clarified and participation can be acknowledged (if an on-line registry).
 - d. Obtain pedigree information.
 - e. If preventives are to be included, use separate fields for heartworm and fleas/ticks drugs, and provide drop down list of commonly available products for each.
 - f. Require certain fields (e.g., owner name, dog name, sex, reproductive status).
 - g. Set validation limits on certain fields (such as DOB and DOD – and their format mm/dd/yyyy)
 - h. Diseases
 - i. The list of “problems” should include only diagnosable diseases and not clinical signs (e.g., diarrhea, vomiting) which are non-specific and non-diagnostic.
 - ii. Have a single dropdown list of all diseases (with an associated field for age of onset) so that owners can select as many as necessary. Include a field for age of onset.
 - iii. A data analyst or database administrator can combine various diseases into categories for comparison with previous surveys.
 - iv. Provide a glossary of terms to assist those not familiar with medical terminology.

Appendix I. Additional Comparison Between 2004 and 2010 Surveys.

Disease Categories

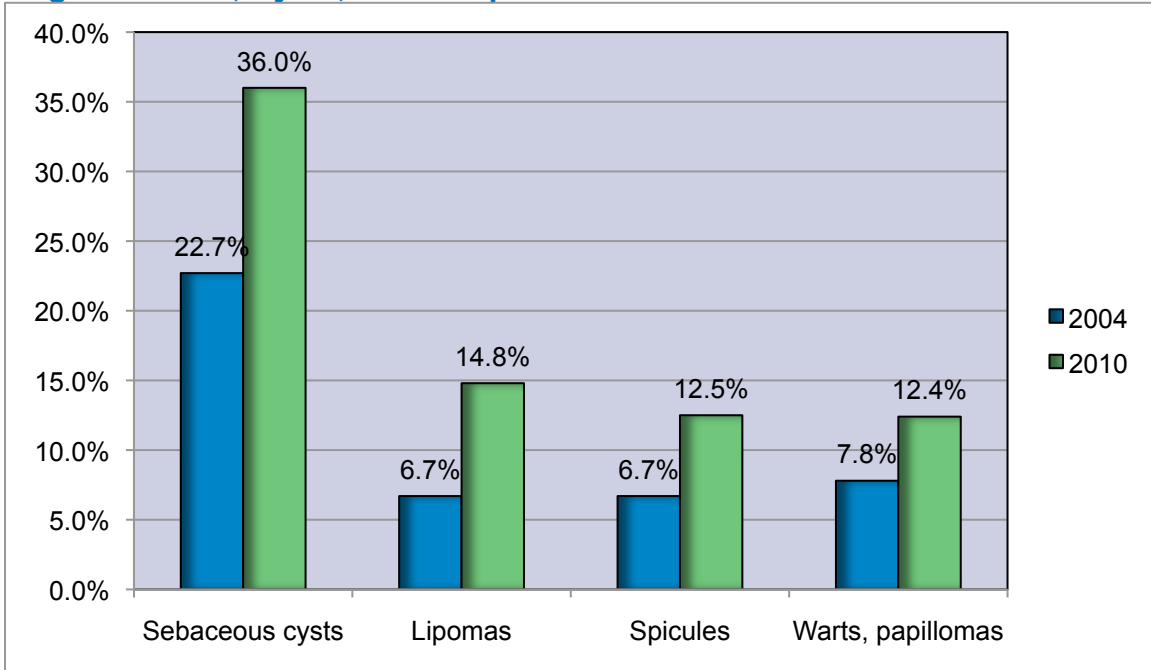
The most frequent disease categories are compared in the chart below arranged in decreasing frequency order for the 2010 survey. The frequency in 2010 was calculated by the formula: (# purebred dogs affected with 1 or more diseases in the category) / # purebred dogs

As noted previously, a new GI Category (GI COMBO) was created for comparison with 2004.



- Warts = Nonmalignant warts, cysts, and lumps
- Skin = Skin, coat, hair (spiculosis is duplicated in this and the wart category)
- M/T = Mouth/Teeth problem
- GI combo = IBD + food hypersensitivity + food intolerance + recurrent vomiting + recurrent diarrhea

Non-malignant Warts, Cysts, and Lumps



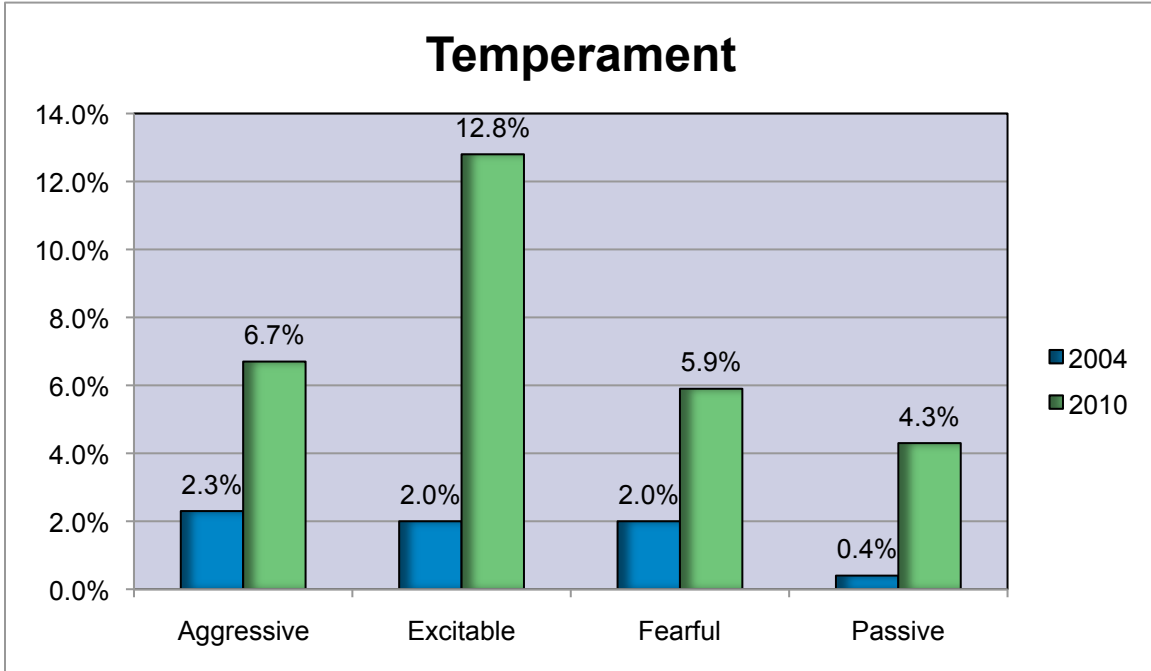
This disease category is by far the most frequent. Other breeds have sebaceous cysts (adenitis). Research in several breeds (Standard Poodle, Akitas, and Samoyeds) has so far not identified a DNA gene(s) or marker(s). There are four closed studied and one current study listed on the AKC CHF site - <http://www.akcchf.org/research/funded-research/1346.html>

The following is from the OFA website: “Two factors make SA (sebaceous adenitis) particularly difficult for breeders to control: the possible late onset of the disease, and the subclinical state of the disease. With late onset, the dog may have already been bred long before it ever shows clinical signs of the disease. In its subclinical state, an owner may be unaware that the animal is affected since it shows no visible signs of the disease.

The challenge in controlling the disorder is in identifying dogs as clear, carriers, or affecteds. DNA testing remains the "gold standard" in terms of identifying a dog's genotype, however, at present there is no DNA test to determine a dog's status with regard to SA. Today's best alternative is the phenotypic evaluation through the skin biopsy. As enough phenotypic information on families of dogs is entered into the database, breeders will be able to make educated assumptions on a dog's genotype. This will allow breeders to apply greater selective pressure in controlling and reducing the incidence of the disease.”

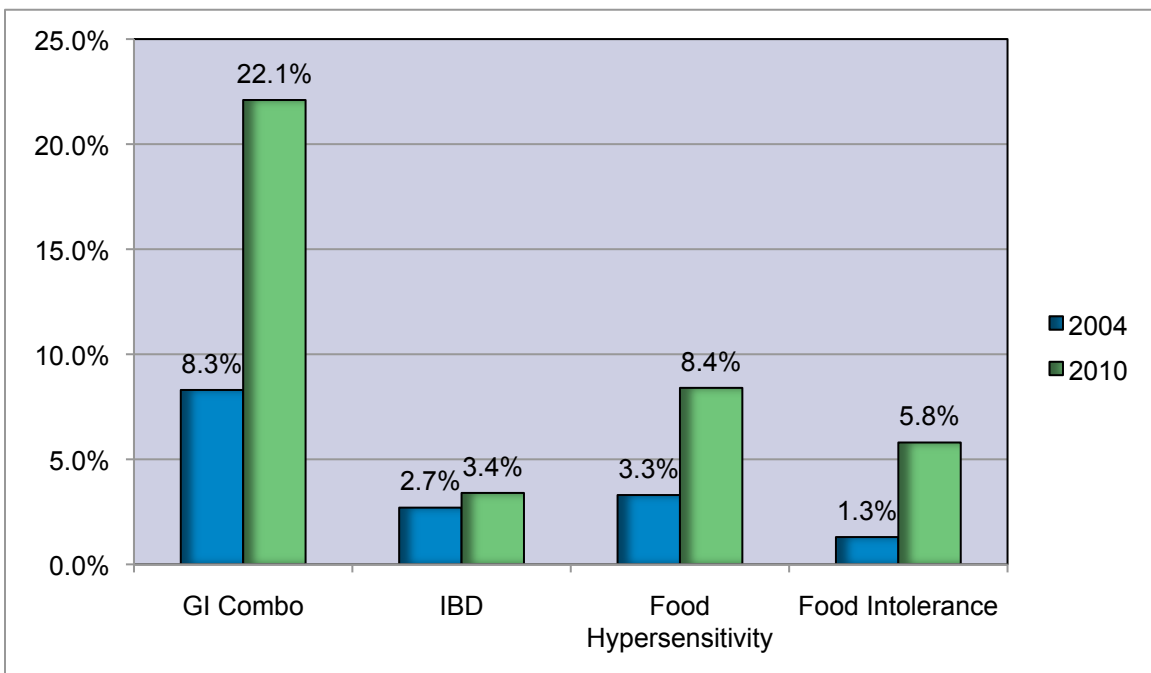
Presently OFA offers a SA registry; minimum age is 12 months old. “The attending veterinarian examines the dog for clinical symptoms of the disease and notes any findings on the application form. A minimum of two 6mm punch biopsy samples are taken from the skin of the dog's neck between the top of the head and the withers. If there are areas of scaling and hair loss, samples should be taken from those areas.” (OFA web site)

Temperament



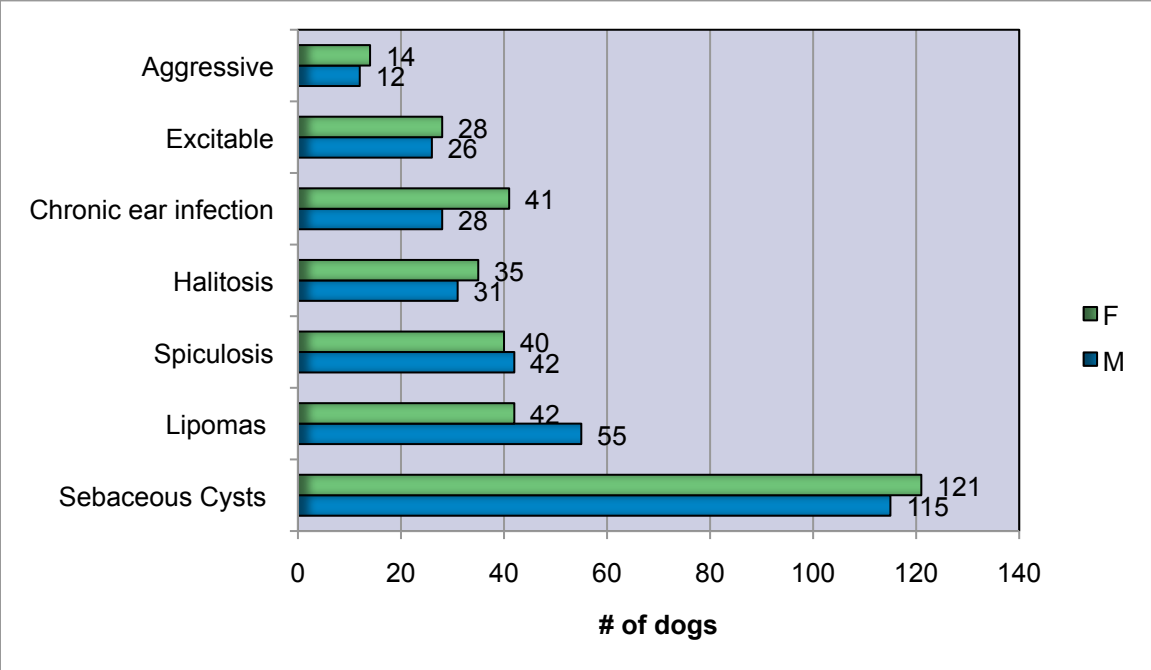
Each category of temperament was markedly higher in the 2010 survey. The relevance of this depends on whether a temperament characteristic is normal and acceptable for the breed and what the change between surveys, thus over time, might mean.

Digestive System

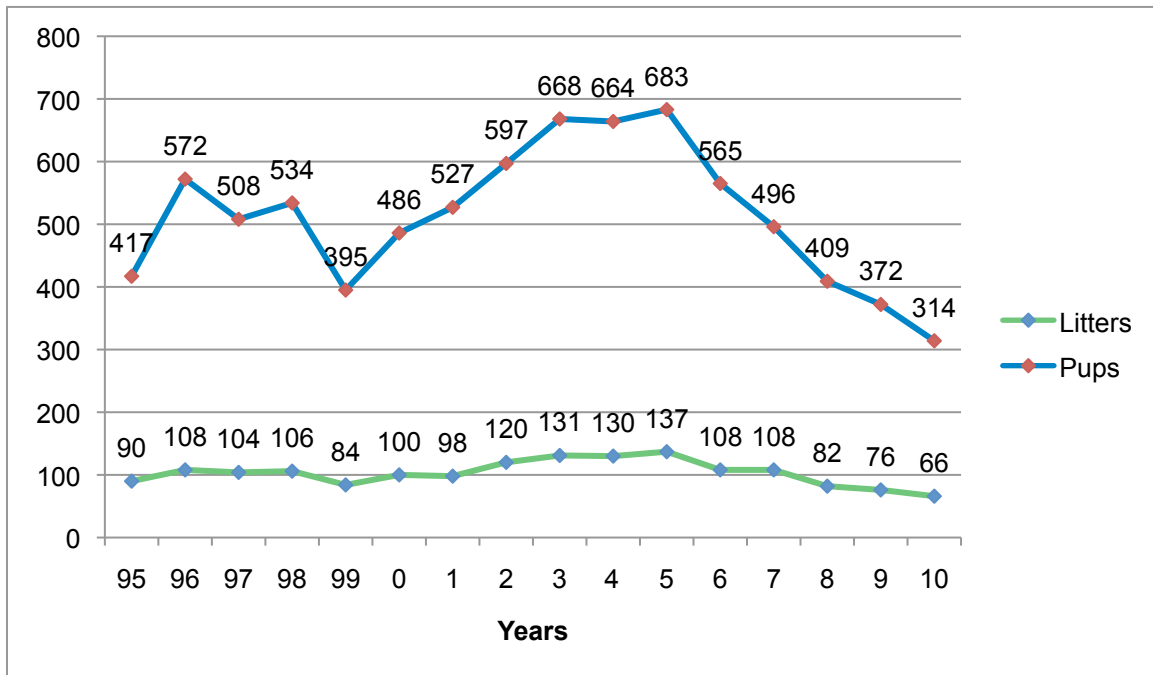


The GI Combo was defined on pages 16-17. As in 2004, the data suggest that the KBT has one or more digestive problems that merit further scrutiny. It is possible that some dogs with clinical signs only might also have IBD; educational efforts about that possibility and how to establish a diagnosis may be of benefit.

Sex Distribution of Frequent Problems



Appendix II. AKC Litter/Puppy Registrations for 1995-2010.

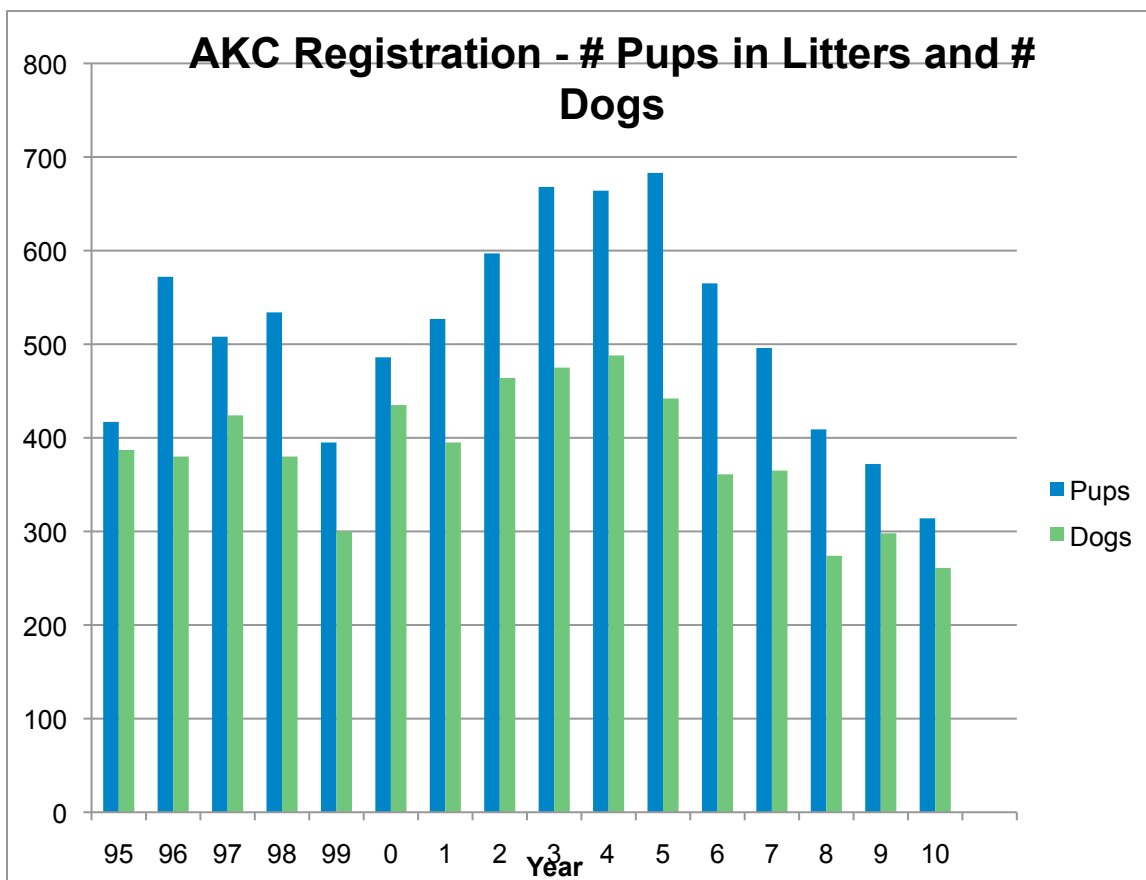


These data are from an AKC litter/puppy registration statistics report. Litter registrations and number of pups peaked in 2003-2005 and, have declined steadily to half the number of both pups and litters in 2010 compared to 2005. The average number of pups per litter was 5.0 (range 4.6 - 5.4).

Appendix III. AKC Pup and Dog Registration

The pup registration numbers in this graph are the data given in Appendix I. The dog registrations were individual dog registrations, probably most done by owners after puppy purchase.

Since some dogs born late in one year will be registered in the following year, it isn't completely correct to calculate the percentage of registered/born with data from a single year. Even so, it is apparent from the graph that overall the registration of both pups in litters (by breeders) and of dogs (by owners) has been in decline since 2005. This phenomenon has been occurring in other breeds, too.



Appendix IV. AKC CHF CHIC Data (December 2010)

Health Test Done	# dogs	%
Hips (required)	128	100
CERF (required)	128	100
Elbows	28	21.9
Thyroid	22	17.2
Cardiac	16	12.5
Degenerative Myelopathy	16	12.5
vWD	7	5.5
Factor XI	6	4.7
Patella	5	3.9

These data are for 2002-2009 when KBTF participate in the CHIC program. All but hip and CERF exams were optional.

Appendix V. KBT CERF Research Report for 2004-2008

Year	# CERF	# Abnormal*	# Hereditary
2004	31	5	1
2005	45	12	8
2006	43	2	1
2007	40	5	2
2008	29	7	4

*Not all abnormalities are hereditary.

Though there are few hereditary problems documented, the question is whether or not more would be found if more dogs were being CERF'd. Until a larger proportion of breeding stock is screened regularly at yearly intervals, it is hard to know.

Appendix VI. Health Screening Tests in KBTs (from OFA website - December 2010)

Health Screen	# KBT	% Normal	% Abnormal
Hips	1424	93.6%	5.9%
Thyroid	72	88.9%	1.4%
Heart	29	100%	0
Degenerative myelopathy	60	45%	10%
Elbow	161	95%	5%
vWD	18	83.3%	5.6%

Appendix VII. Participant Comments.

All general comments were reviewed. Many were related to the owner's happiness with dog for various reasons. Those that may be useful in future planning are listed below; names were removed to preserve anonymity.

- Cysts.
 - This male has been extremely healthy. Spicules, cysts and warts are the common problems with him.
 - The first Kerry I owned had no skin problems (cysts). Every Kerry I've owned since and the older ones I've met recently, all have this problem.
 - The biggest problem is sebaceous cysts. Otherwise she is quite healthy.
 - Other than recurring cysts, this Kerry has been extremely healthy.
 - In my opinion the KBT is overall a healthy dog breed but I believe breeders need to concentrate on eradicating inherited skin diseases more closely.
 - I love my KBT and I want to keep her healthy. Is there anything I can do to prevent the cysts and tumors?

- Auto immune. disease lumps all over body, some would get infected

- Eye.
 - In general, from my experience, and that of other family members who have had KBT, dry eye is a significant problem which needs more aggressive treatment by a canine ophthalmologist.
- Dietary
 - At age of 5 developed allergy to dog food, changed 4 times during life to eliminate diarrhea.
- Renal.
 - I provided a pedigree because of PLE and that it is usually passed down to puppies.
 - 2 Kerry puppies dying of juvenile renal failure at 6 mo. and 8 mo. of age. These puppies from different breeders were related to each other.
- Behavior/temperament.
 - I love my Kerry and despite his aggressive issues I have always been able, through training or avoidance, been able to keep him and others safe and happy
 - I believe the breeders are putting too much emphasis on conformation and "spark" to win in the ring and not nearly enough emphasis on health and solid temperament
 - How about you do a survey of Kerry temperament? I think that would be useful. It should include pedigree info, so problems or especially good personality traits can be traced.
 - Others commented about the good temperaments of their KTBs.
- Vaccination.
 - I have had 3 Kerries which have had reactions to rabies shots. I have had 2, which have developed a cancer that studies are now finding are a result of yearly vaccination.
 - I have found that since reducing the frequency of vaccination and only giving a C3 my dogs have been much healthier