BeaCon Open Health Registry Report
April, 2014

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Preamble

This is BeaCon's 14th year in existence and the 13th year of reporting the health status of Bearded Collies in our Open Health Registry. Each owner and breeder who participates in the open health registry makes an important contribution to our knowledge.

The reader is referred to the year 12 report's introduction for information about participation, use of the database, pedigree information, and use of data.

New breeders in particular face the dilemma of having limited amounts of data on which to make an informed decision about what would constitute a good pairing. One can go to the various registries for information such as the OFA web site or CERF, but it should be understood that the appearance of a dog in one of these registries does not automatically indicate that the dog has normal results. If the dog is not listed, then a copy of the original test results should be requested. The BeaCon Open Health Registry should not be used as a definitive source for health screening test results. Readers are encouraged to contact a dog's owner for confirmation and additional information as needed.

Our goal continues to be the inclusion of every Beardie possible, whether or not it is used in a breeding program. We therefore discourage selectively entering only certain dogs or not entering some health problems, we want all dogs and all health problems and all lines!

BeaCon encourages breeders to enroll pups in the Open Health Registry before they go to their new homes. Having a large number of healthy young dogs to follow over the long term is an optimal resource for determining frequency of diseases in any breed.

Since participation in the registry is voluntary, there are a number of large holes in the data; this means that some lines are missing. That should not be interpreted as those lines being free of health issues as compared with lines represented in the registry.

Respectfully submitted, the Board of Directors for the Bearded Collie Foundation for Health (BeaCon)

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April 2014

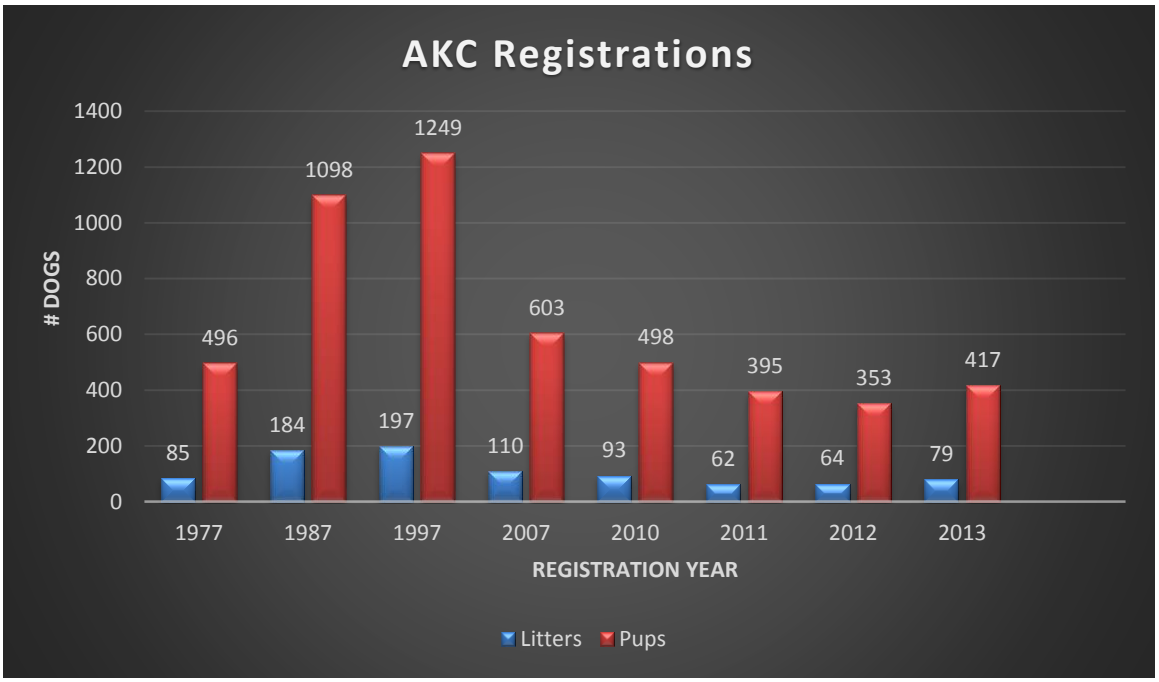
WebSite.

The website (www.beaconforhealth.org) was updated in 2012 and 2013.

Registration Statistics for Dogs, Litters, and Pups (AKC and KC)

USA registration data begin with 1977 when the breed was recognized by AKC. The decline in number of USA litters and number of pups in registered litters from 2002-2006 was statistically significant. The decline seen in the USA (AKC figures) mirrored that seen in the UK (KC figures) which are shown in the table on the next page.

In 2013 for the first time in 3 years, there was a slight increase in the number of litters, pups in litters, and dogs registered with AKC, but these still are below those of 1977, the founding year. It remains to be seen if the rebound continues.



USA yearly registration information since 1977 the founding year, and for the UK since 1989 are shown in the table on the next page.

Year	USA - AKC				UK - KC		
	# Dogs Registered	# Litters Registered	# Pups in Litters	Av # pups/ Litter	# Registered	# Litters	av# pups per litter
2013	319	79	417	5.3	543	91	6.0
2012	269	64	353	5.5	463	78	5.9
2011	345	62	395	6.4	538	93	5.8
2010	321	93	498	5.4	572	95	6.0
2009	331	84	463	5.5	528	90	5.9
2008	393	82	421	5.1	643	113	5.7
2007	413	110	603	5.5	606	98	6.2
2006	447	90	537	5.2	720	119	6.1
2005	485	109	658	6.0	650	113	5.8
2004	562	150	842	5.6	821	129	6.4
2003	543	154	897	5.8	668	109	6.2
2002	587	159	943	5.9	901	140	6.4
2001	620	165	953	5.8	721	121	6.0
2000	682	183	1031	5.6	952	150	6.4
1999	614	196	1202	6.1	1034	175	5.9
1998	752	175	1077	6.2	1119	179	6.3
1997	711	197	1249	6.3	1286		
1996	720	178	1031	5.8	1318		
1995	762	186	1105	5.9	1467		
1994	640	177	1057	6.0	1337		
1993	749	157	912	5.8	1506		
1992	766	182	1092	6.0	1575		
1991	796	194	1162	6.0	1621		
1990	700	181	1062	5.9	1715		
1989	713	185	1128	6.1	1945		
1988	817	190	1175	6.2			
1987	760	184	1098	6.0			
1986	797	185	1175	6.4			
1985	858	191	1253	6.6			
1984	858	209	1330	6.4			
1983	895	201	1190	5.9			
1982	763	196	1257	6.4			
1981	723	172	1095	6.4			
1980	653	155	909	5.9			
1979	588	127	782	6.2			
1978	472	111	684	6.2			
1977	446	85	496	5.8			
1976	-	-	-	-			

BeaCon Open Health Registry

Data throughout the report represent all Beardies in the registry.

Number of Owners and Dogs

There are 779 owners with 2312 Beardies, an increase of 130 dogs this year. Of the total, 174 dogs are in the private sector of the open registry. Their information will not display in on-line searches or reports using the database; however, it is used in this report.

Year	# Owners	# Dogs	Dogs added	Months Included
13	779	2312	130	Mar 13 – Feb 14
12	755	2182	129	Mar 12 – Feb 13
11	729	2053	307	Mar 11 – Feb 12
10	646	1746	176	Mar 10 – Feb 11
9	606	1570	144	Mar 09 – Mar 10
8	560	1426	223	Mar 08 – Mar 09
7	491	1203	242	Mar 07 – Mar 08
6	410	961	153	Feb 06 – Feb 07
5	357	808	130	Dec 05 – Jan 06
4	315	678	85	Dec 04 – Nov 05
3	278	593	183	Dec 02 – Nov 03
2	205	410	107	Sept 01 – Nov 02
1	169	303	-	July 00 – Aug 01

Update Information

This year 233 owners updated information on 585 dogs.

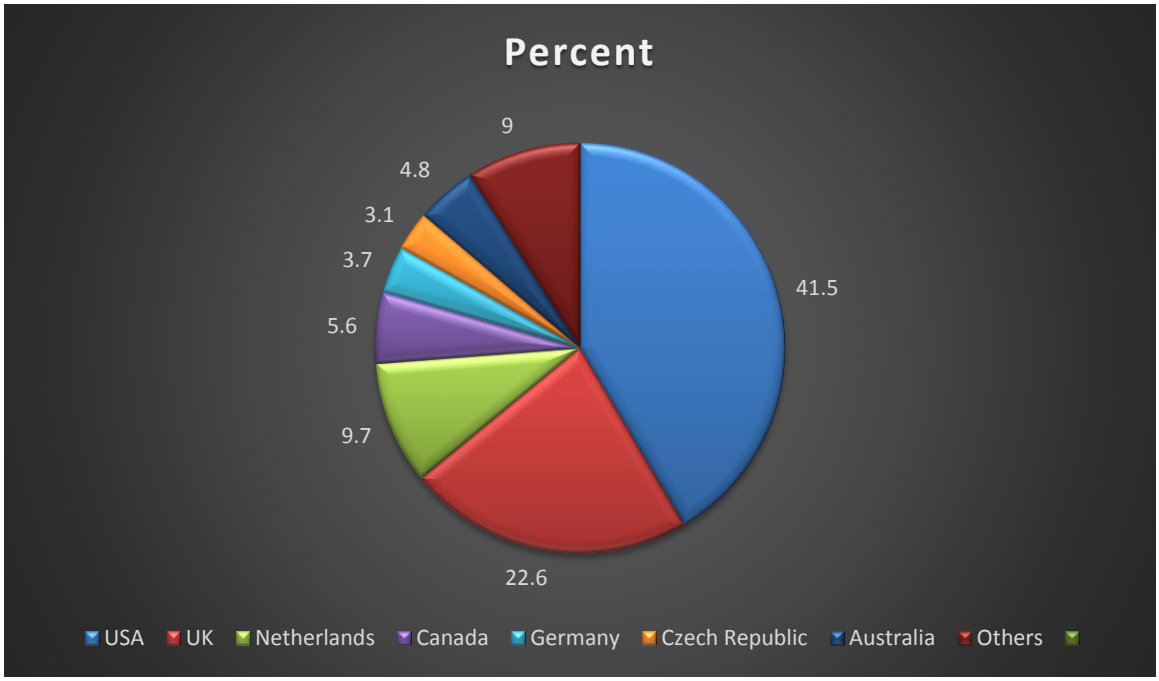
Geographic Location

These are arranged in descending order by number of owners in a country. There was minimal or no increase in owners from any location.

Country	Owners (#)	Dogs (#)
USA	401	960
UK	151	522
Netherlands	45	224
Canada	44	129
Germany	31	86
Czech Republic	23	72
Australia	21	112
Others*	83	207
Total	**799**	**2312**

*Other owner locations include Austria, Belgium, Brazil, Denmark, Finland, France, Hungary, Ireland, New Zealand, Norway, Portugal, Slovakia, South Africa, Spain and Sweden.

Country of Dog's Origin



General Information (# = 2312)

Sex and Reproductive Status

These figures are similar to those in past years.

Sex	# Dogs	
Male	1038	
Intact	634	61.1%
Neutered	390	37.6%
Unspecified	14	
Female	1274	
Intact	662	52.0%
Spayed	602	47.3%
Unspecified	10	

New Dogs

Of the 130 new dogs entered in the last year, 100 were listed as healthy; of those 100, 60% were born after 2010. This high proportion of new dogs who are well has been seen in previous years.

Living Dogs

The average age of living dogs who have been updated in the past five years is 8.0 (min =0.2; max = 16.9).

Health Problems

Presentation is by groups. The five major groups being autoimmune (# = 322), behavioral (# = 315), endocrine (# = 260), cancer (# = 171), and allergy (# = 133). Some diseases are included in more than one group. For examples, diabetes mellitus is in both autoimmune and endocrine groups; inflammatory bowel disease is in both allergy and autoimmune groups. Other diseases not among the five major groups are presented at the end of this section.

Autoimmune (AI) Disease

There were 322 cases of AI disease in 259 dogs. The percentage of dogs with one or more AI diseases was 11.2% (259/2312); that percentage has been the same for the last two years. The frequency of individual AI diseases is also essentially the same as in previous years.

Although autoimmune thyroiditis belongs with AI health problems, its incidence is unknown in this population. A thyroid panel includes thyroid autoantibodies which are the diagnostic hallmark of autoimmune thyroiditis; too few dogs have had a complete thyroid panel. Data from OFA labs for 681 Bearded Collies through December 2013 (this is 76 more tests in 2013) indicate that autoimmune thyroiditis was present in 1.3%, idiopathic hypothyroidism happened in 0.9%, 12.0% had equivocal tests and 85.7% of tests were normal. Bearded Collies ranked 72 out of 103 breeds which have at least 50 OFA thyroid panels performed. It is hoped that a repeat test was done on the dogs with equivocal tests and that breeders are following the BCCA CHIC thyroid panel testing guidelines to do an OFA thyroid evaluation from an approved lab each year until 5, thereafter every 2 years. There were 146 dogs in the OHR with a diagnosis of hypothyroidism and 127 of those had at least one thyroid screening test.

Disease	#	% of All Dogs (n=2312)	% of AI Dogs (n=252)
Addison's disease (hypoadrenocorticism)	83	3.6	32.9
Symmetrical lupoid onychodystrophy (SLO)	82	3.6	32.5
Inflammatory bowel disease (IBD)	29	1.3	11.5
Autoimmune hemolytic anemia (AIHA)	27	1.2	10.7
Vaccination reaction	20	0.9	7.9
Systemic lupus erythematosus (SLE)	19	0.8	7.5
Autoimmune-mediated thrombocytopenia (AITP)	16	0.7	6.4
Immune mediated arthritis	16	0.7	6.4
Pemphigus	7		
Discoid lupus erythematosus	7		
Keratoconjuntivitis sicca	5		
Demodectic mange	6		
Diabetes mellitus	3		
Myositis	2		
Myasthenia gravis	1		

Associated Diseases

- Multiple AI Diseases
  - 39 dogs had 2 or more AI diseases
  - 25 dogs had two, 9 dogs had three
  - 5 dogs had four problems.
- Addison's disease
  - Fear of loud sounds – 21 (25.3%)
  - Hypothyroidism - 17 (20.5%)
- AIHA
  - AITP – 4

Age of Onset

Age of onset was not given for all dogs so the number in the table below may be fewer than those in the preceding table. The diseases are arranged in order of increasing average age of onset; the N represents dogs whose age of onset were given.

Disease	Av age	Min	Max	N
SLO	4.0	0.83	13.58	79
Vaccination reaction	4.1	0.17	12.75	23
Addison's	4.6	0.5	12.5	84
IBD	4.7	0.5	12	27
Immune mediated arthritis*	5.5	0.33	11	18
AIHA	5.6	0.17	10.5	26
AITP	7.0	1.33	8.92	14
SLE	7.6	1.5	13.5	19
Keratoconjuncivitis sicca	10.8	7.9	16.1	5

*When cases under the age 7 were considered (n=8), the average age of onset was 3.1. How the diagnosis was made is not known and some of the older dogs may have had age related disease rather than autoimmune.

Sex Distribution of AI Disease

The percentage by sex distribution was calculated for the more frequent diseases. Since the percentage was higher for females in most diseases, just that is given in the table below. The list is arranged in descending order of female prevalence.

Disease	# Female	% Female
AITP	11	78.6
Vaccination reaction	17	73.9
AIHA	18	69.2
SLE	12	63.2
Addison's	50	59.5
Immune mediated arthritis	8	59.0
SLO	36	45.6
IBD	13	44.1

Behavioral, Temperament Issues

If you have had a Beardie fearful of loud unexpected noises or other behavioral/temperament issue, you are not alone. Various factors can contribute to these issues and it may be a topic to study in greater detail in the future.

General Categories

Issue	N
Fear	252
Aggression	37
Hyperactivity	13
Obsessive compulsive disorder	13

Fear

The fear reactions of Bearded Collies reported in the open registry are predominantly to loud sounds which can't be anticipated by the dog (other than thunder which follows the lightening precursor).

Object of Fear	N (% of all dogs)
Loud sharp noises	207 (9.0)
Other	29 (1)
Everything	9
Stranger	8

The fear of loud sounds has been recognized for some years. Although an association between fear and hypothyroidism exists, it is unclear whether that signifies causation. Certainly the fear is ameliorated in some dogs when hypothyroidism is corrected by treatment. Among those who were fearful to loud sharp noises, 45 (21.8%) were also hypothyroid. As many dogs are never tested for hypothyroidism, this percentage could be higher.

Aggression

Object of Aggression	N (% of total)
Dog	17 (.7)
Family	11 (.5)
Strangers	5

Aggressive behavior has led to euthanasia of dogs from many breeds. Sometimes that is the only choice. It is important to rule out medical problems that could be causing the dog physical discomfort, pain, or hypothyroidism. Aggressive behavior can take many forms and families/individuals differ widely in the level of aggression they are prepared to tolerate/live with. Beardies are often willing to test owners and if a growl gets them out of doing something they don't want to do or gets them something they want they will likely try it again. Because they are intelligent and easily bored it is important that they have plenty of exercise both physical and mental, and their owners make clear the behavior expected of them. If the aggression is determined to be behavioral it is often possible to modify the behavior or manage it so that dog

and owner can live in harmony. In some cases psychoactive drugs will be helpful in ameliorating the aggression to the point where it is easier to reestablish appropriate behavior. In most cases the dog can then be weaned off the medication. Basket muzzles, gates etc., may also be useful during this time. The help of a skilled trainer and/or veterinarian specializing in behavior will be invaluable.

Endocrine Problems

Hypothyroidism is by far the most common endocrine problem both in the Bearded Collie and other breeds. See the autoimmune section for comments about autoimmune hypothyroidism.

Disease	N (%) of All Dogs	Av Age of Diagnosis (yr)
Hypothyroid	147 (6.4%)	8.1
Addison's disease	83 (3.6)	4.6
Cushing's disease	27 (1.2)	10.7
Diabetes mellitus	3	
Insulinoma	2	

Hypothyroidism has a wide range of ages at diagnosis. While it is commonly stated that hypothyroidism is usually detected in dogs age 4-7, this is the age at which the more traditional symptoms of hypothyroidism usually become apparent, behavioral and more subtle signs appear in younger dogs. In general dogs up to age 7 primarily have thyroiditis past that age hypothyroidism increasingly becomes attributable to senescence of the thyroid gland. It is important to understand that hypothyroidism is present from an endocrine perspective of decreased thyroid gland function long before the clinical signs appear. Both factors were the rationale behind the BCCA CHIC recommendation for a yearly thyroid panel until age 5 and then yearly after that. There were no cases of hypo- or hyperparathyroidism.

Cancer

The reported locations for cancer in 171 dogs are given in the following table; the frequency of all cancers was 7.4%.

Location	#
Mammary	19
Liver	17
Spleen	13
Nasal	12
Stomach	10
Bone	7
Abdominal	7
Hemangiosarcoma	6
Testicular	4
Kidney and spinal cord	3 each
Other	75

The 72 "other" cancers were in no predominant location. As a result of low necropsy rate and uncertainty about location of the cancer by the treating veterinarian, the prevalence and types of cancer within the breed remain indeterminate. If desired, a list of the other cancers can be generated online in the open registry by using the search or report function.

Immunoglobulin Mediated Disorders

It is not known how these problems were diagnosed. The open registry doesn't specifically ask for this information although there is space to provide it. Allergy generally and flea bite allergy specifically, are mediated by immunoglobulin E (Ig E) whereas, food sensitivity and intolerance is mediated by immunoglobulins A and M (IgA and IgM). Inflammatory bowel disease is related to food sensitivity or intolerance. This group of disorders is the fourth most common (n=133; 5.8%).

Disease	# (%) of All Dogs
Dietary allergy/food intolerance	45 (2.0)
Atopy	32 (1.4)
Inflammatory bowel disease	29 (1.3)
Flea bite allergy	27 (1.2)

Other Diseases or Problems

Frequency is calculated if there were 20 or more cases.

Problem	# Dogs	% All Dogs
Umbilical hernia	70	3.0
Arthritis (note 1)	65	2.8
Hip dysplasia	62	2.7
Cataract	40	1.7
Urinary infection	36	1.6
Eye, other	34	1.5
Depigmentation	31	1.3
Pyometra	31	1.3
Hearing loss (note 2)	28	1.2
Nail problems, other	26	1.1
Cryptorchid	22	1.0
Hot spots	20	0.9
Teeth, overshot	20	0.9
Cognitive dysfunction	19	
Vestibular disease	19	
Kidney failure, cause unknown (note 3)	18	
Monorchid (note 4)	16	
Stroke (note 5)	15	
Epilepsy, idiopathic (note 6)	12	
Neurological, other	11	
Bladder stones	11	
Elbow dysplasia	11	
Exercise induced hyperthermia	10	
Teeth, base narrow	10	

Note 1: Arthritis. Age of onset was given for 59 dogs; it was over 9 years of age in 38.

Note 2: Hearing loss. Two dogs had early onset. One was deaf at a month of age; the other began to go deaf at age 5 yr 3 mo and was almost completely deaf by age 7 yr. The latter dog had two deaf littermates, so the cause was considered genetic by the owner.

Note 3: Kidney failure of unknown cause. Eight (50%) with this diagnosis had onset of disease before age 9 years (average age of onset was 5.5 yrs). 1 case was diagnosed as chronic interstitial nephritis by biopsy. 1 case was associated with SLE; a littermate also died early of kidney failure and their dam died of SLE. In three the kidney failure resolved according to the information provided. In three, the course of the kidney failure isn't known. Beyond these cases, it should be remembered that kidney failure is a common finding in dogs with Addison's disease at first presentation.

Kidney and liver failure are symptoms of leptospirosis (as is uveitis). Antibiotic therapy should be instituted immediately in all suspected cases of leptospirosis, even if the dog was vaccinated as vaccines are unreliable at best. It should also be realized that titers are unlikely to be positive until at least 10 days after symptoms first appear, so the dog should be titered again.

Note 4: Monorchid means that the dog only has one testicle anywhere in its body and is extremely rare, likely some dogs reported as monorchid are actually cryptorchid which means that one or both testicles have failed to settle in to the scrotum by age 12 weeks but are present elsewhere in the abdomen. This is a relatively common condition.

Note 5: All were over the age of 10.5 years.

Note 6: There is insufficient information given in the cases of idiopathic epilepsy with respect to how the diagnosis was made. Review of the cases doesn't provide history that would be compatible with idiopathic epilepsy in most; namely, few had persisting seizures or required anti-convulsant medication for control.

Health Screening Tests

Screening Test Done	# tests	# dogs	% of all dogs
Hips	832	827	35.8
Eyes	688	510	22.1
Thyroid	480	335	14.5
Elbows	203	203	10.0
Prelim hips	25	25	1.1
Hips and eyes		404	17.5
Hips and thyroid		227	9.8
Hips and elbow		197	8.4
Hips, eyes, and thyroid		182	7.0
MDR-1	26	26	1.1
DLA	18	18	0.8
Von Willebrand's Disease	11	11	

CEA	3	3	

The number of individual health screens done increased only minimally this year. It can be seen that some dogs had some health screens done more than once (e.g., eye and thyroid). DLA (dog leukocyte antigen) haplotype testing is a recently available screen in Europe and this test was done on 16; there was no dominant haplotype among those dogs. All MDR-1 results (n=26) were normal. The CEA (Collie Eye Anomaly) exams were normal.

CEA was identified in a Bearded Collie in the UK in 2012. At present there is a program to contact the owners of dogs that shared recent common ancestry to the affected dog to inform them of the situation. Recommendations have been made regarding testing with the offer of financial help. Parentage testing for the CEA affected dog has also been offered. As new information comes in, BeaCon will post it on the website.

Reproductive Outcome

Dogs.

Reproductive history was recorded for 179 dogs and 164 were bred; 80 (44.7%) had semen checked and a few provided additional information beyond "excellent" or "motility good". Ideally a semen exam should include information about color, sperm count, sperm motility, and sperm morphology. In addition to the semen exam, the dog should have an exam of external organs and for scrotal torsion or prolapse.

Item	#
# times a dog used at stud	
1	56
2	37
3	19
4	10
5	13
6	3
7	3
8	6
9	5
10 or more	12
Total # bitches bred	636
Litters produced	566
Total puppies produced	3305
Total female puppies produced	1430
Total male puppies produced	1491

As would be expected, a pregnancy did not result from each breeding. The number of puppies produced was not listed for some dogs, so the number of total male and female puppies is less than the total number of puppies.

Later Health Problems in Dogs' Progeny

Health Problem	# dogs producing problem	# progeny with problem
Cryptorchid	21	47
Other	16	See notes below
Symmetrical lupoid onychodystrophy	10	16
Hypothyroid	10	12
Addison's	9	20
Systemic lupus erythematosus	2	2

Other problems produced by 16 dogs included: umbilical hernia 5 (produced by 2 dogs), heart anomaly type not identified 3, overshot bite 2, and 1 each – monorchid, persistent pupillary membrane, patent ductus arteriosus, immature kidney syndrome, AIHA, transitional vertebrae, low platelets, nail problems, and myositis.

Fourteen dogs produced more than one problem. A number had "unknown" recorded for whether a problem had been produced or not. As one stud dog owner wrote, "I can only attest to the problems I've been informed about".

Bitches.

355 bitches were bred with 621 litters and 3826 pups produced. Average number of pups per litter was 6.2. Cesarean section delivery was done in 70 (11.3%). The resorption rate or stillborn rate is 37/621 (6%); there is no way to know when pregnancy failed. An additional 249/3826 (6.5%) died by 6 weeks of age.

Breeding Methods Resulting In Live Pups. (Unknown in 45).

Method	# Bitches
Natural	411
A/I fresh	63
A/I chilled	22
A/I frozen	15
A/I operative	17
Natural and A/I	17

Progeny and Early Identifiable Issues

Information about the number of puppies and early issue was provided for 621 litters.

Male pups		
	#	% of total
total born	1998	-
live born	1788	89.5
live @ 6 wks	1668	83.5
		% of live born
cryptorchid	90	5.0
mismark	76	4.3
umbilical hernia	71	4.0

bad bite	15	
poor pigment	14	
cleft palate	3	
Female pups		
	#	% of total
total born	1818	-
live born	1679	92.4
live @ 6 wks	1550	82.3
		% of live born
mismark	82	4.9
umbilical hernia	68	4.1
bad bite	15	
poor pigment	6	
cleft palate	3	

Later Health Problems in Bitches' Progeny

	# Bitches	Total #
Addison's	17	23*
Symmetrical lupoid onychodystrophy	14	19
Systemic lupus erythematosus	4	3
Hypothyroid	13	15
Other	34	25**

* One bitch produced 6 Addisonian puppies; one bitch produced 2 Addisonian pups

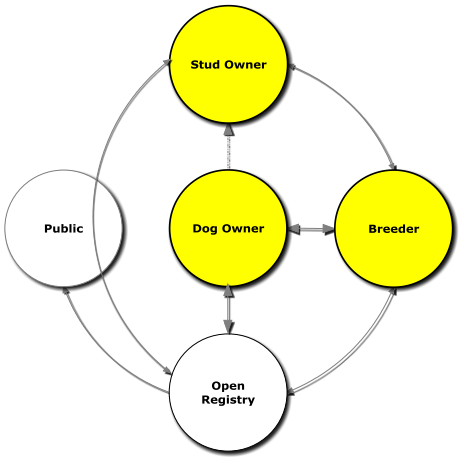
** Among the other are early, potentially congenital or heritable conditions:

- 6 heart problems (3 PDA; 1 persistent right aortic arch; 1 murmur, diagnosis unknown; 1 heart anomaly, diagnosis unknown)
- 3 exocrine pancreatic insufficiency
- 2 renal dysplasia; pyelonephritis (1 died at 3 wks, other at 21 mos) *(note: it is rare to die from pyelonephritis, so it is possible there was another more lethal diagnosis for the kidney problem)*; seizures (1 diagnosed with idiopathic epilepsy); autoimmune hemolytic anemia; ulnar shortening (1 noted to be from premature closure of growth plate; the other associated with elbow deformity ? related to metabolic disorder)
- 1 each - hyperthyroid, discoid lupus, kidney failure (several died as young dogs), myositis, hip dysplasia, sudden collapse, loss of pigment

Diffusion of Health Information.

It would be prudent if many more breeders (AKA bitch owners who produce litters) would communicate more often with the owners of stud dogs. Even then, the breeder can only attest to problems they have been informed about. Thus, the gap in the flow of information can only be closed by an owner informing their breeder of a dog's wellness status or health problem.

Ideal Diffusion of Health Information



Any open registry (e.g., BeaCon, OFA, or CERF) is a repository for various types of information (e.g., health screening test results from approved laboratories) that is available to others. If health information doesn't get deposited in an open registry, then it isn't available other than by word of mouth which has limited distribution and is prone to rumors. These tend to spread widely and with much exaggeration.

Less than ideal diffusion of health information removes 1 or more, or all of the arrows in the above figure.

Mortality

General

The percentage of deaths in each age group is calculated by # deaths/total deaths regardless of whether or not the cause of death was given.

There were 685 (29.6%) deaths reported. The average of death was 12.0 yrs., the minimum was 0.1 yr, the maximum 17.6 yrs.

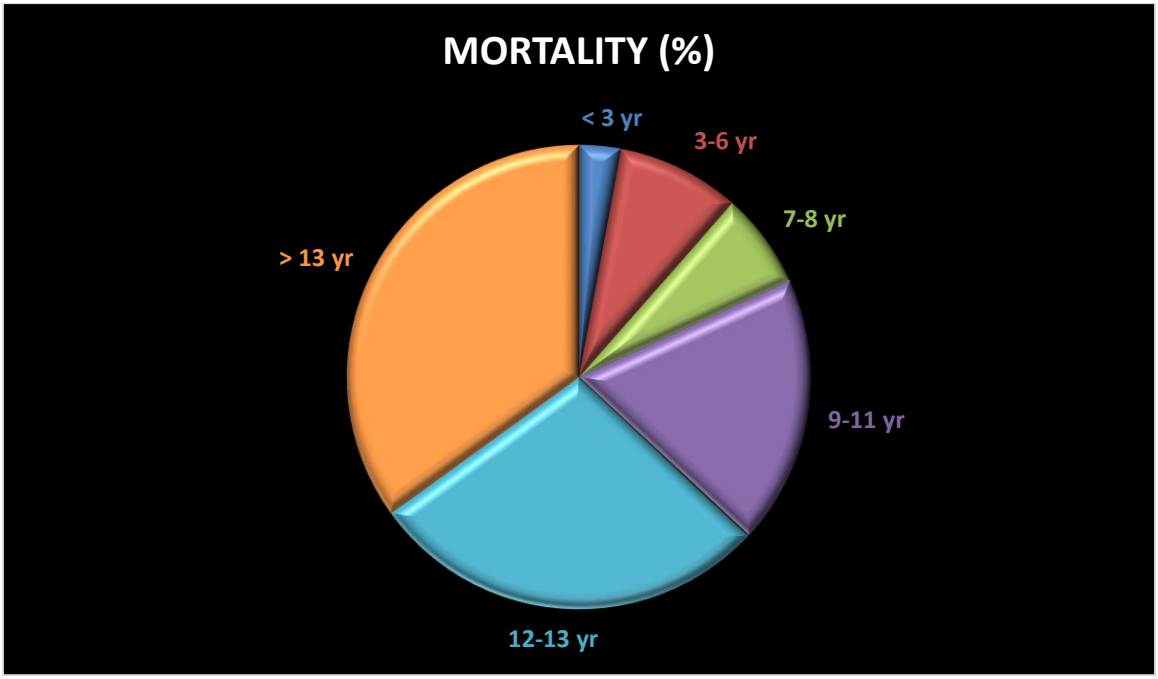
Necropsies were conducted on 40 (6.1%). It should be remembered that necropsies will sometimes be helpful in establishing the cause of death. If more necropsies were done in those where death is not due to very old age, there would certainly be more identifiable causes of death.

Mode of death was natural in 95, euthanasia in 530, accidental in 21, and not documented in 38.

Age Group Distribution

Owners may have given month and year, or sometimes only year, for age of death. For those, an estimated exact date of death was assigned by using the first day of the month (if month and year were given) or assigning the date as 1/1/yyyy (if only year was given). In no case did the assignment of estimated exact date of death change the age group that the dog was in for purposes of evaluating causes of death.

	Age at Death (yrs)					
	< 3	**3-6**	**7-8**	**9-11**	**12-13**	**>13**
# dogs	20	57	46	128	192	239



Leading Causes of Death

	Age at Death (yrs)					
	< 3	**3-6**	**7-8**	**9-11**	**12-13**	**>13**
Problem/Issue	**# cases**					
Cancer	-	9	13	50	48	33
Old Age	-	-	-	4	30	118
Autoimmune	6	12	10	14	17	1
Stroke*	-	-	-	1	10	14
Accidental	5	6	3	3	2	3
Aggression	2	4	1	-	1	-
Other	6	15**	12	32	53	37***
Unknown	1	11	7	27	31	35

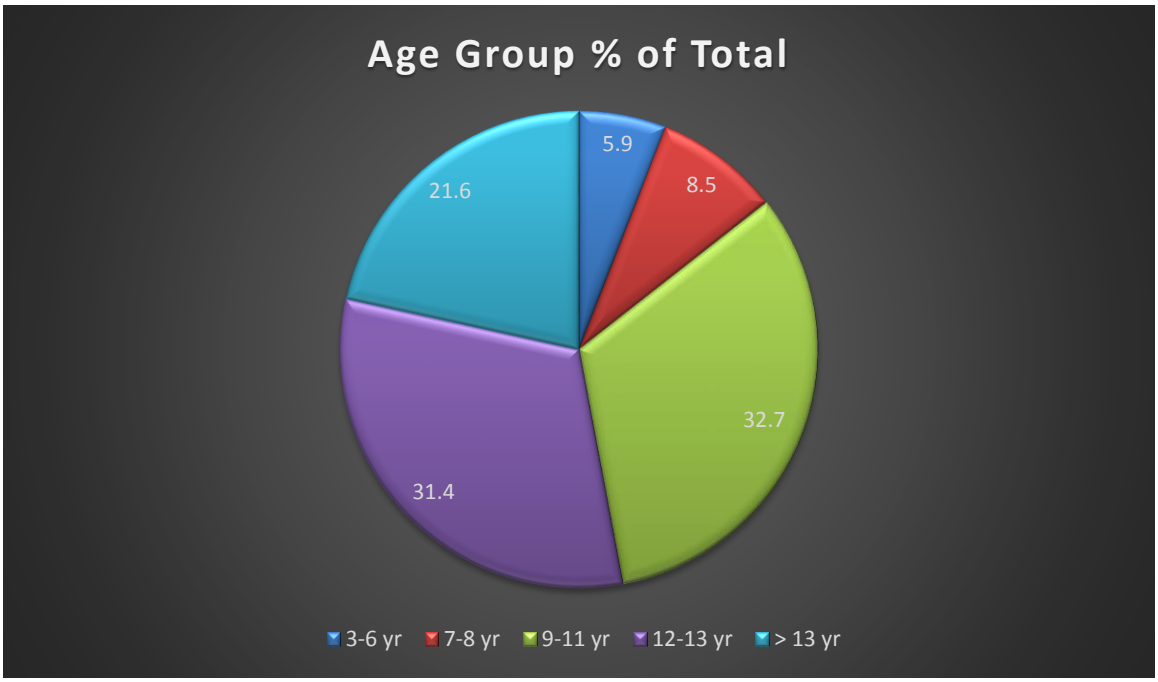
The “other” problems are mostly single cases.
*It should be noted that old dog vestibular disease from which dogs routinely make complete recovery in 3-21 days is often mistaken for stroke (and vice versa) which may also resolve usually in a slightly longer time period; it can also be mistaken from brain tumors which obviously to not resolve but are uncommon.
**Renal failure: 5 in the 3-6 age group; 3 in the 7-8 age group; 6 in the 9-11 yr group; 6 in > 13 yr group.

***> 13 age group other included 6 with arthritis, 7 with vestibular disease, 4 with cognitive dysfunction and 3 with seizures.

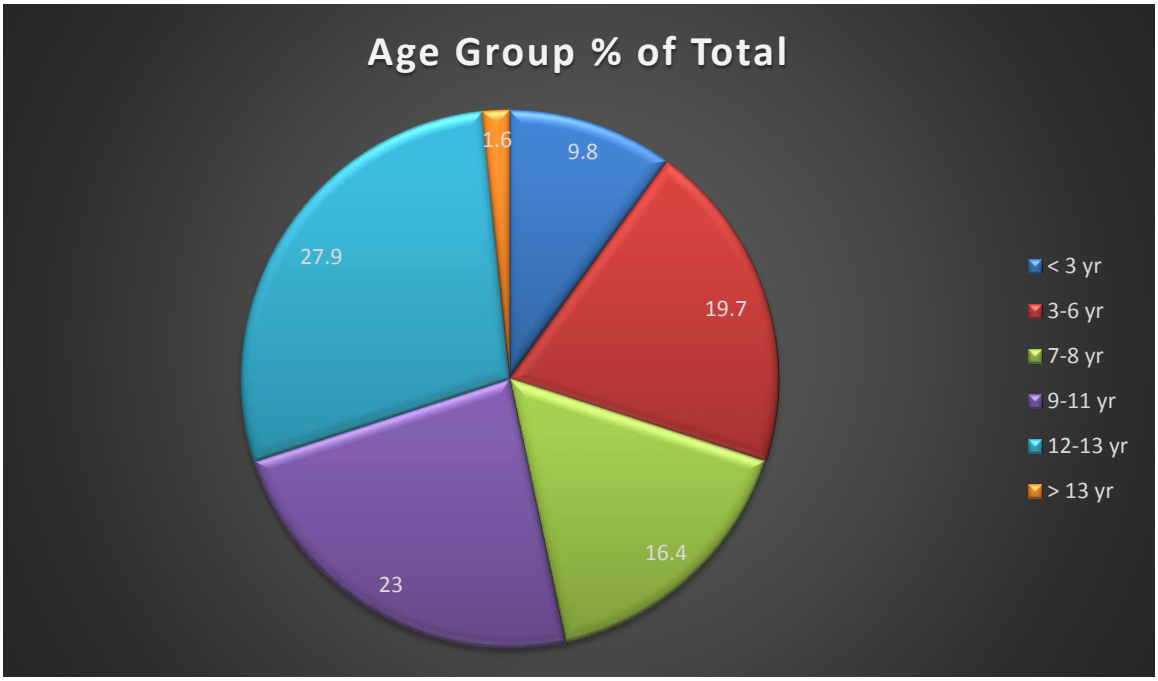
The leading causes of death (n=123) before 9 years of age were autoimmune (22.8%), cancer (17.9%), and accidental (11.4%). The high percentage dying from autoimmune disease at a young age has been a persistent finding over the years, as has been the diagnosis of autoimmune diseases in this age group. Those observations should be of concern sufficient to emphasize the need for cooperation in the effort to develop a foundation for research. Likewise, early deaths from cancer deserve attention.

After 11 years, there were 431 deaths; 34.3% were due to old age and 18.8% were due to cancer.

<u>Cancer Deaths (n=153)</u>



Autoimmune Disease (n=61)



Autoimmune diseases take their toll across all age groups other than the oldest dogs. Number of cases for each disease cumulatively across age groups were: Addison's 19, AIHA 11, SLE 7, AITP 4, IBD and SLO 3 each, others 10.

Coefficient of Inbreeding (COI)

COI indicates the closeness of relationship in a pedigree. A higher number means more closely related; a lower number indicates less closely related. It is usually expressed as a percentage. The concept was developed by Sewall Wright (Coefficients of inbreeding and relationship. Am Nat. 56:330-8, 1922). The basic concept is that inbreeding exists when an ancestor appears on both sire's and dam's side of the pedigree.

BeaCon uses Breeder's Assistant software to calculate a 10 generation COI; this is displayed at the top of each dog's pedigree. These values may differ from those obtained by other pedigree programs due to the algorithm used for calculations. Further information about COI's and their meaning can be found on the internet and also on BeaCon's web site in the section on open health registry data.

The data for the USA 1997 AKC stud book were calculated by trying to use just one dog from each litter so as to represent unique litters. Foundation stock on October 1, 1976 consisted of 939 dogs.

The data for 10 generation COI's by country are arranged by decreasing COI. Given the large standard deviations, the differences between countries are not significant. The values simply reflect the breeding pools of the dogs in the open health registry. Almost all countries have a maximum COI over 40; the two exceptions are Belgium and Finland. All countries have a

minimum COI of 6-14 except for the UK which is zero, due to one breeder who has used non-KC registered sires.

Ten Generation COI's

Year Report/Other	Coefficient of Inbreeding (10 gen)				
	# dogs	Av	Min	Max	Std dev
USA – 1977 stud book	318	18.3	3.8	40.1	
USA – 2011 Specialty BOB	72	22.9	11.9	40.3	
Year 13					
All dogs	2267	23.2	1.2	52.9	6.3
UK	504	25.0	0	52.9	7.5
USA	942	23.2	11.2	49.0	5.9
Canada	127	23.0	9.2	47.5	7.0
Belgium	26	22.4	14.3	38.9	6.7
Finland	51	21.6	9.9	31.4	5.6
Czech Republic	71	21.8	11.2	47.3	6.2
Australia	111	21.7	10.8	42.1	5.5
Netherlands	221	21.1	9.2	40.8	6.2
Germany	84	20.2	8.9	42.4	6.8

Comparison of Five and Ten Generation COI's (n=2267)

	Five Gen	Ten Gen
Av COI	5.7	23.2
Min COI	0	0
Max COI	34.0	52.9
# with COI 0.00	243	19
# with COI < 10.0	1791	29

The significant drop in average COI between 5 and 10 generations indicates that a major contributor to the close relationships is from ancestors beyond 5 generations. So, when a breeder considers what COI he/she is striving for among all the variables to be considered in breeding, what is the answer? That depends on what you consider the breed average to be where you live. At present there are too few dogs in this health registry to use the above data for a guide.

A list of 5 and 10 generation COIs for dogs in the public sector of the Open Registry is available in the Breeder's Section of the web site.

Conclusions

No major changes from previous years were found in the cumulative data reported here. The predominant health issues continue to be autoimmune diseases (Addison's and SLO leading the

list), behavioral and temperament issues, endocrine disorders, immune mediated problems, and cancer. Reproductive outcome and problems in progeny are similar to that of previous years.

The distribution of diseases responsible for death at certain ages continues as in previous years. Cancer deaths are more prevalent in dogs over 8 years of age. Deaths from autoimmune diseases occur across the age spectrum except for those over 13 years of age. The lack of necropsy and the large number of unknown causes of death contributes to less than ideal understanding of causes of mortality.

BeaCon's Directors thank everyone who has contributed to the open health registry.