

BeaCon Open Health Registry Report

April, 2016

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Preamble

This is BeaCon's 15th year in existence and the 14th 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 base.

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. Go to <http://www.beaconforhealth.org/Yearly-Reports.html> and select 2012.

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.

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

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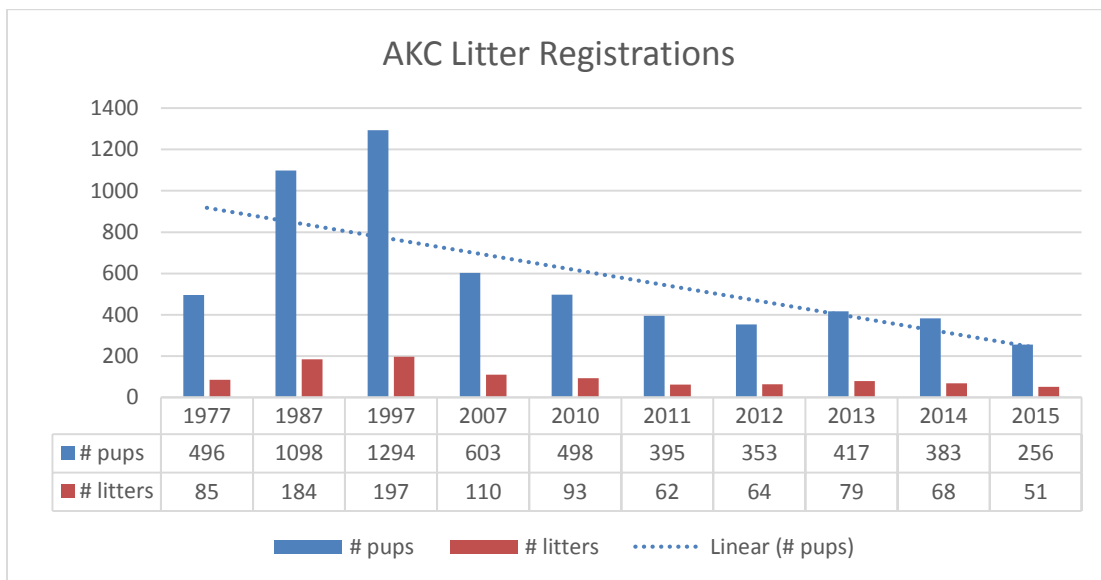
WebSite.

www.beaconforhealth.org

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 data) mirrored that seen in the UK (Kennel Club data) which is shown in the table on the next page. Recently the Kennel Club has placed the Bearded Collie on the breed watch list which indicates concern that the breed could be headed for so few registrations as to be placed on the vulnerable list.

There has been no appreciable change in the number of litters, pups in litters, and dogs registered with AKC in the last four years. Registrations have been below those of 1977, the founding year, since 2011. The continued decline over the past five years should be viewed as a warning about the breed's existence and is a subject for the parent club breeders to address in the immediate future.



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
2015	247	51	256	5.2	346	53	6.3
2014	289	68	383	5.6	371	64	5.6
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. Some dogs are in the private section of the registry (by preference or breeder reporting) and they will not appear in the public searches or reports. Data analysis was done in the week starting March 20, 2016.

Number of Owners and Dogs

There are 848 owners with 2722 Beardies, an increase of 271 dogs in the 12 month period. Of the total, 247 dogs are in the private sector of the open registry. Although their information will not display in on-line searches or reports, it is used in this report.

Year	# Owners	# Dogs	Dogs added	Months Included
15	848	2722	271	Mar 15 – Mar 16
14	804	2451	139	Mar 14 – Mar 15
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

Information was updated on 568 dogs, 401 of those living. For all living dogs in the registry (#=1353) that means that only 30% were updated this year. Some of the dogs who are still coded as living are undoubtedly deceased as judged by their dates of birth but the owners have been lost or they have just not updated information.

Geographic Location

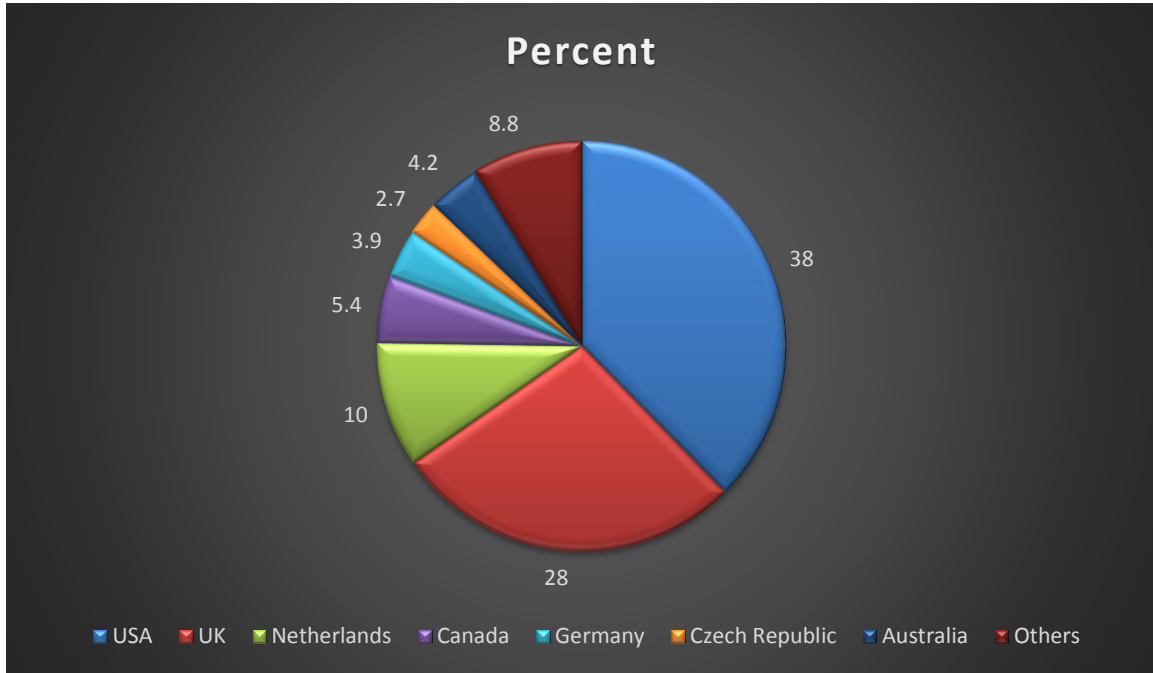
These are arranged in descending order by number of owners in a country. There was minimal or no increase in owners from any location.

Country	Owners (#)	Dogs (#)
USA	417	1030
UK	177	771
Netherlands	50	278
Canada	47	147
Germany	33	106
Czech Republic	22	72
Australia	21	115
Others*	81	203
Total	848	2722

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

Graph - Dog's Country of Origin

Compared to last year, there was a 2% decrease from the USA and a 6% increase from the UK.



General Dog Information (# = 2722)

Sex and Reproductive Status

These figures are similar to those in past years.

Sex	# Dogs	
Male	1203	
Intact	752	62.5%
Neutered	425	35.3%
Unspecified	26	
Female	1519	
Intact	829	54.6%
Spayed	671	44.2%
Unspecified	19	

New Dogs

Of the 271 new dogs entered in the last year, 204 were listed as healthy and of those, 112 (55%) were born in the last 5 years. This high proportion of healthy new dogs has been noted in previous years.

Living Dogs

The average age of living dogs (n=949) born after 4/1/2000 who have been updated in the past five years is 6.3. It is possible that some of the older dogs are deceased but haven't been updated.

Health Problems

Presentation is by groups. The five major groups being autoimmune (# = 369 cases in 304 dogs), behavioral (# = 328 cases in 273 dogs), endocrine (# = 287 cases in 250 dogs), cancer (# = 219 cases in 201 dogs), and allergy (# = 141 cases in 112 dogs). Some diseases are included in more than one group; 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 369 cases of AI disease in 304 dogs. The percentage of all registry dogs with one or more AI diseases was 13.6% (369/2722), which is up 2% from last year. The frequency of individual AI diseases was unchanged.

Although autoimmune thyroiditis belongs with AI health problems, its incidence is unknown in this population because complete thyroid panels aren't always done. A thyroid panel includes thyroid autoantibodies which are the diagnostic hallmark of autoimmune thyroiditis. Data from the OFA database for 781 Bearded Collies through December 2015 (this is 50 more tests in 2014) indicate that autoimmune thyroiditis was present in 0.1%, idiopathic hypothyroidism happened in 0.8%, 10% had equivocal tests and 80.4% of tests were normal. Bearded Collies ranked 88 out of 112 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 are 157 dogs in the OHR with a diagnosis of hypothyroidism.

Disease	# dogs	% total dogs	% with disease
Addison's disease (hypoadrenocorticism)	97	3.6	31.9
Symmetrical lupoid onychodystrophy (SLO)	95	3.5	31.3
Autoimmune hemolytic anemia (AIHA)	33	1.2	10.9
Inflammatory bowel disease (IBD)	32	1.2	10.5
Vaccination reaction	21	0.8	6.9
Systemic lupus erythematosus (SLE)	21	0.8	6.9
Immune mediated arthritis	19	0.7	5.9
Autoimmune-mediated thrombocytopenia (AITP)	18	0.7	5.9
Discoid lupus erythematosus	9		
Pemphigus	8		
Demodectic mange	6		
Keratoconjunctivitis sicca	5		
Diabetes mellitus	5		
Myositis	4		
Myasthenia gravis	1		

There was essentially no change in the frequency of A/I diseases among all dogs or the frequency of individual A/I diseases.

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	#
Vaccination reaction	2.7	24
SLO	3.8	95
IBD	4.2	32
Addison's	4.8	94
Immune mediated arthritis*	4.9	19
AIHA	5.8	33
AITP	6.8	18
SLE	7.5	17
Keratoconjunctivitis sicca	10.7	5

Sex Distribution of AI Disease

The percentage by females having the more frequent diseases in the table below is arranged by descending order of female prevalence. With newly reported cases this year, the order changed somewhat from previous years.

Disease	# Female	% Female
Vaccination reaction	21	87.5
AITP	13	72
AIHA	22	66.7
SLE	13	65
Immune mediated arthritis	12	63.2
Addison's	57	60.6
IBD	14	43.8
SLO	41	43.2

Behavioral, Temperament Issues

There were 328 temperament problems reported in 273 dogs. If you have had a Bearded fearful of loud unexpected noises or other behavioral/temperament issue, you are not alone. Various factors can contribute to these issues and may be a topic to study in the future.

General Categories

Issue	#
Fear	260
Aggression	38
Hyperactivity	13
Obsessive compulsive disorder	12

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	# (% of all dogs)
Loud sharp noises	208 (7.6)
Other	30 (1.1)
Everything	10
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 (21.6%) were also hypothyroid. As many dogs are never tested for hypothyroidism, this percentage could be higher.

Aggression

Object of Aggression	# (% of total)
Dog	19 (.7)
Family	11 (.4)
Strangers	3

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 may be invaluable.

Endocrine Problems

There were 287 endocrine problems in 250 dogs. 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	# (%) of All Dogs	Av Age of Diagnosis (yr)
Hypothyroid	157 (5.8%)	7.2
Addison's disease	94 (3.5%)	4.8
Cushing's disease	29 (1.1%)	10.2
Diabetes mellitus	5	
Insulinoma	2	

Cushing's disease is obviously a later onset problem in the breed.

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 every two years. There were no cases of hypo- or hyperparathyroidism.

Cancer

There were 219 cancer cases (8.1%) reported in 201 dogs.

Location	#
Mammary	25
Liver	24
Nasal	16
Spleen	15
Stomach	10
Abdominal	9
Bone	8
Hemangiosarcoma	9
Testicular	5
Kidney	6
Other	90

The 90 "other" cancers were in no predominant location. A list of the other cancers can be generated online in the open registry by using the search or report function.

Because of the low necropsy rate and lack of biopsy, the prevalence of cancer and location remains indeterminate.

Deaths from cancer is presented in the mortality section.

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 with 141 cases (5.2%) in 112 dogs.

The average of onset was young for all four disorders – between 3.1 and 4.2 years.

Disease	# (%) of All Dogs	Av age onset (yr)
Dietary allergy/food intolerance	48 (1.8)	3.5
Inflammatory bowel disease	32 (1.2)	4.2
Atopy	31 (1.1)	3.1
Flea bite allergy	28 (1.0)	3.4

Other Diseases or Problems

Frequency is calculated if there were 20 or more cases.

Problem	# Dogs	% All Dogs
Umbilical hernia	72	2.7
Arthritis (note 1)	75	2.8
Hip dysplasia	66	2.4
Urinary infection	47	1.7
Pyometra	43	1.6
Cataract	41	1.5
Eye, other	41	1.5
Depigmentation	38	1.4
Hearing loss (note 2)	33	1.2
Nail problems, other	28	1.0
Vestibular disease	26	1.0
Cryptorchid	24	1.0
Kidney failure, cause unknown (note 3)	24	1.0
Hot spots	20	
Teeth, overshot	21	
Cognitive dysfunction	19	
Monorchid (note 4)	18	
Epilepsy, idiopathic (note 6)	16	
Stroke (note 5)	15	
Exercise induced hyperthermia	14	
Neurological, other	14	
Elbow dysplasia	14	
Teeth, base narrow	12	

Note 1: Arthritis. Age of onset was given for 66 dogs; it was over 9 years of age in 44 (67%).

Note 2: Hearing loss. Three dogs had early onset. Two were deaf by 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. Nine diagnoses 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. 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 several weeks after onset of symptoms.

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 total dogs
Hips	977	972	35.7
Eyes	731	571	21
Thyroid	504	354	13
Elbows	234	234	8.6
CEA/CH	49	49	1.8
MDR1	32	32	
Prelim hips	25	25	
DLA	23		
Von Willebrand's disease	11		
Hips and eyes		454	16.7
Hips and thyroid		241	8.9
Hips and elbow		226	8.3
Hips, eyes, & thyroid		197	7.2

Some dogs had some health screens done more than once, particularly eye exams and thyroid tests. DLA (dog leukocyte antigen) haplotype testing is a recently available screen in Europe and this test was done on 23 dogs. There was no dominant haplotype among those dogs. All MDR-1 results (n=26) were normal.

Colliet Eye Anomaly/Choroidal Hypoplasia (CEA/CH) 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. This year the number having an exam for CEA/CH is 49; last year it was 20 and the prior year 3. All but one gave results and those were normal or clear of the mutation.

OFA Hip Statistics. Since Jan 1974, with 4721 exams, there were 16.8% excellent; 6.3% dysplastic. For 2011-2015 with 156 exams, there were 26.9% excellent and 1.9% dysplastic.

Reproductive Outcome

Dogs.

Reproductive history is recorded for 215 dogs and 198 were used for breeding with a total number bitches bred being 856. Only 78 (39%) 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	65
2	42
3	23
4	13
5	14
6	9
7	4
8	7
9	5
10 or more	16
Total # bitches bred	856
Litters produced	749
Total puppies produced	3477
Total female puppies produced	1812
Total male puppies produced	1720

As would be expected, a pregnancy did not result from each breeding. The number of bitches bred and the number puppies produced was not listed for some dogs. There was a substantial increase this year for the number of breedings and litters and pups produced.

Statistics for the dogs who were bred six or more times show that just 41 (21%) bred 79% of the bitches; there were 16 dogs who were bred 10 or more times, which accounted for 39% of bitches bred.

Later Health Problems in Dogs' Progeny

Health Problem	# dogs producing problem	# progeny with problem
Cryptorchid	23	49
Other	21	See notes below
Symmetrical lupoid onychodystrophy	14	20
Hypothyroid	12	12
Addison's	13	27
Systemic lupus erythematosus	2	2

Other problems that are not necessarily diagnosed in puppies: 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, steroid responsive meningitis, cancer and myositis.

Bitches.

422 individual bitches have been bred 750 times; 712 litters and 4088 pups were produced. Average number of pups per litter was 6.2. Cesarean section delivery was done in 12.3% of the litters (77/627=12.3%). The percent live born (average 90%) and alive at six weeks (average 84%) is unchanged from previous years. The number of times a bitch has been bred is below.

Number of times bred	#
1	166
2	118
3	72
4	28
5	10
6	1

Breeding Methods Resulting In Live Pups. (Unknown in 50).

Method	# Bitches
Natural	505
A/I fresh	67
A/I chilled	23
A/I frozen	16
Natural and A/I fresh	23
A/I operative	23

Bitches' 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	2401	-
live born	2135	88.9
live @ 6 wks	1995	74.9
		% of live born
cryptorchid	102	4.8
mismark	87	4.1
umbilical hernia	73	3.4
bad bite	19	
poor pigment	16	
cleft palate	3	
Female pups		
	#	% of total
total born	2234	-
live born	2015	90.2
live @ 6 wks	1876	83.4
		% of live born
mismark	101	5.0
umbilical hernia	76	3.8
bad bite	15	
poor pigment	6	
cleft palate	4	

The most prevalent identifiable early issues remain cryptorchid in male pups, mismarks and umbilical hernias in both sexes.

Later Health Problems in Bitches' Progeny

	# Bitches
Addison's	21
Symmetrical lupoid onychodystrophy	21
Systemic lupus erythematosus	4
Hypothyroid	14
Other	46

There is incomplete reporting of the number of progeny produced by some bitches, so this is no longer being reported.

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 so it is likely there was a more serious kidney or other issue that was not detected*); 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, AIHA

Sharing of Health Information.

Puppy owners, breeders (defined normally as owner(s) of a litter's dam), and stud dog owners all have a vital role sharing health information. When any party fails that responsibility it is to the detriment of future breeding programs and the breed's long term health prospects.

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 837 deaths reported (30.8% of all dogs). The average of death was 12.1 yrs., the minimum was 0.1 year, the maximum 18.9 years (assuming the correct year of death was entered for this dog).

Necropsies were conducted on 47 (5.6%). Necropsies will sometimes be helpful in establishing the cause of death; if more were done there would be more identifiable causes of death.

Mode of death was natural in 114, euthanasia in 683, accidental in 25, and undocumented in 46.

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.

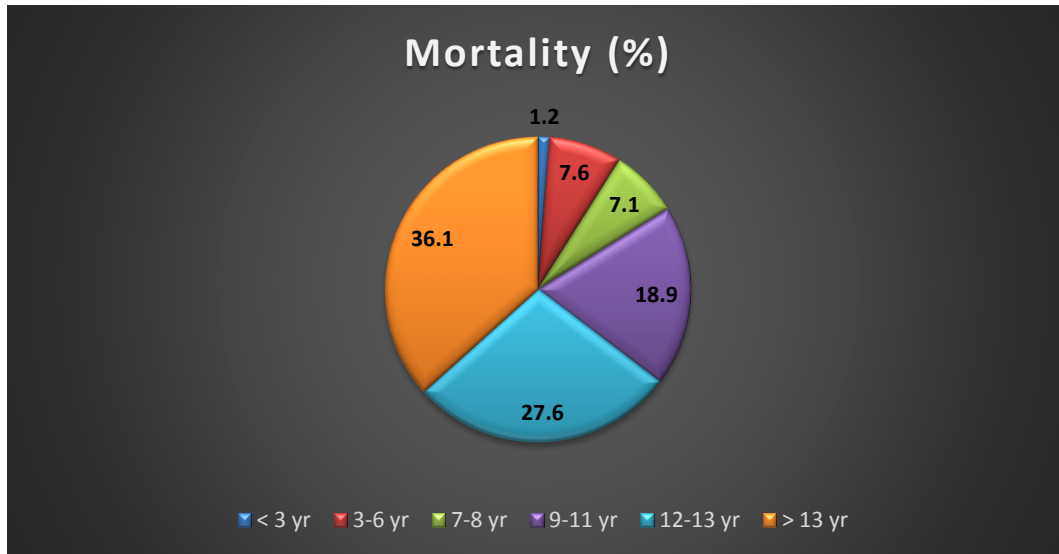
Leading Causes of Death

	Age at Death (yrs)					
	< 3	3-6	7-8	9-11	12-13	>13
# Dogs	24	64	60	159	232	300
# Dogs minus accidental deaths	18	54	56	157	230	300
Problem/Issue						
Cancer	-	14	21	54	66	43
Old Age	-	-	-	6	42	162
Autoimmune	9	15	10	17	16	1
Stroke*	-	-	-	2	15	18
Accidental	6	10	4	2	2	1
Kidney failure, unknown cause	1	3	4	12	11	8
Aggression	2	4	2	-	1	-
Other	6	4	11	52	52	57**
Unknown	-	14	9	14	27	11

The “other” problems are mostly single causes.

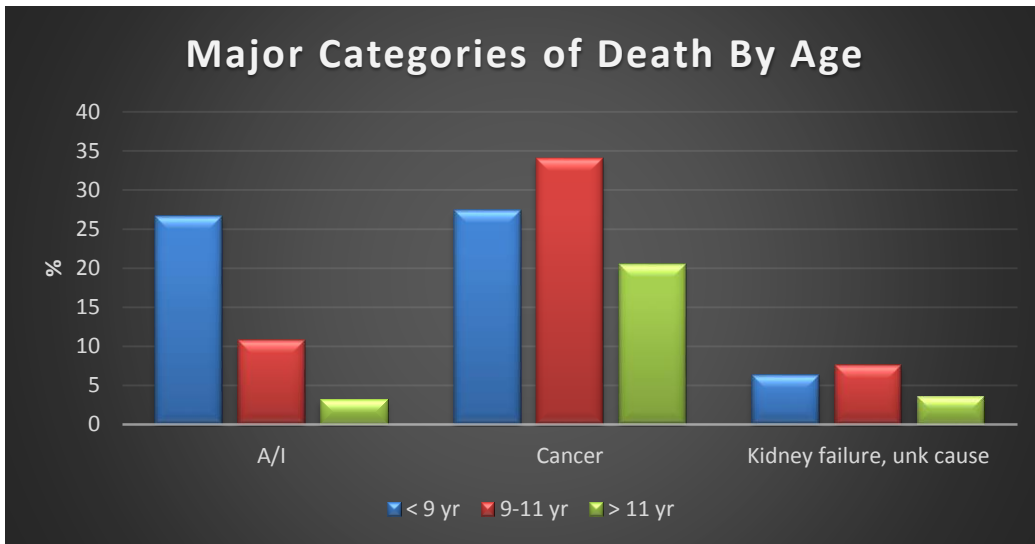
*Old dog vestibular disease from which dogs routinely make complete recovery in 3-21 days is often mistaken for stroke (and vice versa) which may also resolve usually in a slightly longer time period; it could also be mistaken for brain tumors which obviously do not resolve but are uncommon.

**> 13 age group other included 7 with arthritis, 7 with vestibular disease, 3 with cognitive dysfunction

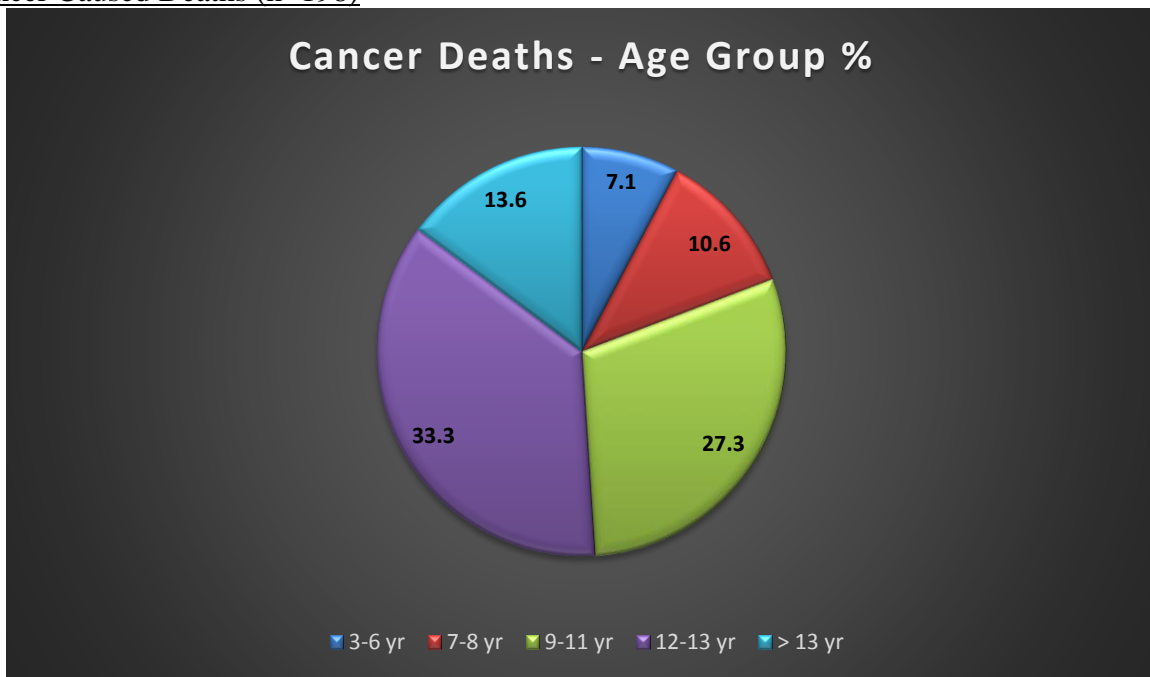


Dogs under 9 years of age accounted for almost 16% of the deaths; of those 148 dogs, 18 were accidental deaths which leaves 128 whose death was caused by a medical condition. For dogs 9 years and older there were few accidental deaths.

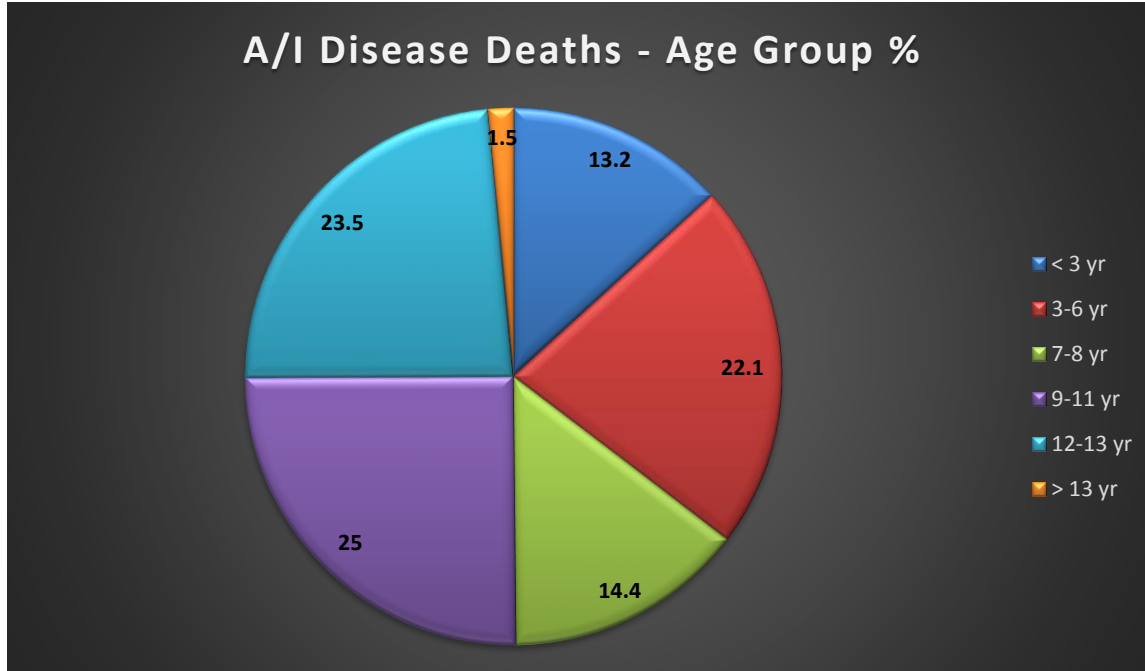
A comparison of the major causes of death across age groups is shown in the graph below. For the first time, this year the number of dogs used in the denominator for calculation of percent deaths by disease excluded accidental deaths.



Cancer Caused Deaths (n=198)



Autoimmune Disease Caused Deaths (n=68)



Autoimmune diseases take their toll across all age groups. There were additional dogs with A/I diseases whose primary cause of death was a different problem.

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.

Methodology

Explanation added April 2015 is in italics. BeaCon uses Breeder's Assistant software to calculate COI's. It is possible to choose the number of ancestor generations and to fine tune the calculation by controlling the treatment of ancestors beyond the number of generations that are visible to the calculation because of multiple occurrences of the same ancestor in different generations of the pedigree. The fine tuning possibilities with Breeder's Assistant are:

1. *Strict options mean that the program is to strictly observe the ancestor generation limit imposed on the calculation; these cannot go beyond the last generation even though that information may be available in the database.*
 - a. **Strict with Minimal Common Ancestor Inbreeding** considers only the inbreeding of a common ancestor that is visible within the pedigree at both the sire and dam side occurrences, on a path by path basis.
 - b. **Strict with Maximum Common Ancestor Inbreeding** uses the maximum inbreeding of the common ancestor as can be deduced by examining its sire and dam side occurrences, again on a path by path basis.
2. *Relaxed options are faster when computing inbreeding to any significant depth of ancestors.*

- a. *Relaxed with Maximal COI* includes all possible common ancestors that can be deduced from the pedigree, subject only to the generation limit.
- b. *Relaxed with Maximal Speed* computes the inbreeding coefficient as fast as possible by ignoring knowledge of the parents of ancestors that only occur in the last generation.

BeaCon uses 10 generations and relaxed with maximal speed for COI calculations. When comparing COI values obtained with other software programs the calculation methodology needs to be identical. All pedigrees in the OHR were recalculated in 2015-16 to assure that each one was done with the identical calculation rule.

Data

The data for the USA 1977 foundation stock were calculated by using just one dog from each litter so as to represent unique litters. The total number of foundation stock on October 1, 1976 was 939 dogs.

To date calculations of COI's for the AKC stud books are complete for 1977 - 1986. It is anticipated that by summer 2016 the calculations will be finished for the stud book dogs through 2015. When that is done, the data will be turned over to a veterinary geneticist for analysis of genetic diversity in USA Bearded Collies. This genetic diversity project is modeled after that done by the Kennel Club (KC) on UK Bearded Collies which was published in 2015. As a result of that project, recently the KC placed the Bearded Collie on the breed watch list which indicates concern that the breed could be headed for so few registrations as to be placed on the vulnerable list.

The data 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. All countries have a minimum COI of 6-14 except for the UK which is zero.

Year Report/Other	Coefficient of Inbreeding (10 gen)				
	# dogs	Av	Min	Max	Std dev
USA foundation stock	318	18.3	3.8	40.1	
USA stud book:					
61-76	1030	18.7	3.8	40.1	2.3
77-81	719	22.1	5.3	41.9	0.6
82-86	745	23.4	8.5	46.1	13.3
Open Health Registry					
Year 15					
All dogs	2677	22.5	0	50.3	6.4
UK					
UK	694	24.2	0	50.3	6.8
USA					
USA	985	23.1	2.3	42.8	5.7
Belgium					
Belgium	26	22.4	14.3	38.9	6.7
Canada					
Canada	145	21.9	6.6	37.6	6.0
Czech Republic					
Czech Republic	71	21.7	11.2	47.3	6.1
Finland					
Finland	52	21.6	9.9	31.4	5.5
Australia					
Australia	115	21.2	5.6	42.1	5.7
Germany					
Germany	104	20.8	7.7	38.4	6.6
Netherlands					
Netherlands	274	18.9	6.4	37.5	5.4

Conclusions

There were no major changes from previous years, other than a near record number of newly registered dogs.

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 gives uncertainty regarding causes of mortality.

The OHR needs as many Beardies as possible, living and dead, to be entered and updated regularly to increase its value as a predictor of emerging health issues, monitor existing ones, and be a useful tool for breeding healthy dogs in future generations.

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