BeaCon Open Health Registry
Year 11 Report
April, 2012

Welcome to BeaCon's Open Health Registry Report for year 11. This is BeaCon's 12th year in existence and the eleventh year of reporting health conditions for Bearded Collies. BeaCon's directors thank each and every Beardie owner and breeder who has made information on their dogs available through the open health registry. You have made an important contribution to the breed by providing current and future breeders and potential new owners with valuable information

Participation

What Dogs May Participate?

- **ALL BEARDED COLLIES** of known parentage
- Deceased or living
- Healthy or with a health problem
- From any country

Who May Submit Information?

- Owners with whom the dog lives.
- A co-owner (consent from primary owner is needed before the dog's record is public).
- A breeder. Starting in the spring of 07, a breeder can also submit information. When a breeder entering pups in a litter prior to sale, if their contract notes the pup is in BeaCon's open registry, that suffices as consent. Otherwise, consent from the primary owner is needed before the dog's record is public.
- Primary owners whose co-owner refuses to let a dog be in the open health registry can still enter the dog in a non-public section (started 2008). This is done by entering a co-owner name in the appropriate field. Such dogs' data will remain private; they cannot be found in searches or reports of the database. Those dogs' individual data will be included in the general tabulation of data, such as the number of dogs with a particular disease, ages, causes of death, etc.
- Breeders who enter a sire or dam can indicate if the dog has produced a disease in offspring. This policy was started in year 3 because breeders are not always able to convince their puppy buyers to participate in the open registry. Dams producing progeny with a disease can have the number of cases and the litter (s) indicated. Sires producing progeny with a disease may have the number of cases indicated. The name of a dog with the specific disease produced cannot be listed without permission of the owner.

How To Submit Information.

This may be done either by hard copy form or preferable, on-line at www.beaconforhealth.org/sqlweb.

Documentation.

No changes have been made from previous years. Copies of health screening test results are requested but the owner is trusted to enter data accurately. Today in the USA health screening results are readily found on-line at the OFA site (www.offa.org); one needs the dog's registered name or AKC registration number for the search.

Updating.

Reminders are sent each calendar year to owners of all living dogs in the registry as of the most recent data entry. Updating should be done yearly, even if the dog has had no changes. You can also update whenever there has been a change in your dog's health or new health screens done – at any time.

Newer Features

- As of March 2009, the search and report function of the OHR became free to anyone who is registered. Currently there are 241 registered users who do not have dogs in the open registry.
- Since fall 2008, there is a non-public section if an individual prefers that their dog's information not be in the public view or when a co-owner refuses to give the primary owner permission to put the dog into the open registry. "Non-public" entries are collated in the yearly statistics only and are not available to the search and report functions. This year there are 37 dogs in the non-public section.

The Value of Large Numbers of Participants

- A large number gives a more comprehensive view of the extent of health problems in the breed because disease frequency is determined by the number of both affected and normal dogs.
    - For example, if there are 57 dogs with Addison's in a total of 916 dogs, the frequency of Addison's is 5.9%, but if the total number of dogs is 1800 dogs, the frequency of Addison's diseases drops to 3.1%.
- To provide whole family information which breeders can use for relative-risk pedigree analysis in diseases that are autosomal recessive.
- To provide data for researchers.
- To allow prospective puppy buyers data on the health conditions affecting Bearded Collies and their prevalence which may enable them to make more informed choices, or at least know what questions to ask breeders.

Pedigrees and Coefficient of Inbreeding (COI)

Every effort is made to have the pedigree be accurate. As new dogs are entered into the database, a five generation pedigree is generated offline and posted. Owners are notified and asked to confirm accuracy of the pedigree. Data for pedigrees come from many sources including pedigrees submitted by owners and online databases. With the advent of the on-line registry system, fewer hard copy pedigrees have been submitted; thus the dependence on other sources. Pedigrees are generated with Breeder's Assistant. If an error is found in a pedigree, please notify E. Sell (beaconbb@bellsouth.net) with the correct information.

A COI is the mathematical definition that elucidates closeness of relationship in a pedigree. It is usually expressed as a percentage and it was developed by Sewall Wright (Coefficients of inbreeding and relationship. Am Nat. 56:330-8, 1922). Basic principles are that inbreeding only exists if the ancestor appears on both sire's and dam's side of the pedigree.

COI's can be calculated by hand, but it is complex; various online sites describe how to do this. It isn't complex if one uses a pedigree software program with the built in calculation. Breeder's Assistant software is used to calculate 10 generation COI's which 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.

Resistance and Dilemmas

Uncertainty about entering dogs into this open health registry will always exist. Some are fearful that a breeder and his/her kennel will be maligned. BeaCon's board encourages owners and breeders alike to

give consideration to balancing such fear with the importance of establishing a record of the breed's health.

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 test results as individuals can enter data and may not send verifying data to the administrator. Readers are encouraged to contact owners for confirmation and additional information as needed.

Use of Data and Caveats

The purpose of this registry is to give objective data on disease and wellness, not to draw conclusions about any particular line, sire, or dam. We leave it to the user to interpret the information as they see fit. For maximum accuracy we need to know that data on any individual dog is current. We therefore make every effort to contact owners each year to up-date their dogs' entry even if it is just to say there has been no change in the dog's health or health clearance status. When studying disease incidence it is important to know that our healthy population for that condition remains healthy or our statistics become less accurate.

The disease frequencies in this report apply solely to this particular population of Bearded Collies. Until the majority of Bearded Collies worldwide have been entered accurately into the Open Health Registry, no conclusions can be drawn regarding the general health status of the breed.

As research uncovers more information on inheritance of disease it becomes increasingly obvious that many diseases are neither simple autosomal dominant or recessive traits. For example, the current research leads us to believe that up to 40 genes may be involved in whether or not a dog gets a particular autoimmune disease! Some genes have been found that affect the likelihood of getting any autoimmune disease while others relate to specific diseases. This supports pedigree analyses, which showed autoimmune disease in particular lines no matter which type of disease, while some breeds have higher incidence of a particular autoimmune disease.

Genes have been found that increase risk of disease while others protect against it, and a dog can carry both. Epigenetic changes alter how a gene is expressed or the phenotype of a cell without changing the genetic (nucleotide) sequence. These changes remain for the life of a cell, but can also be inherited at least through several mammalian generations. We have long known that environmental triggers as well as stress – physiological, physical or psychological – is somehow involved in the expression of autoimmune and other diseases, and likely this is the result of epigenetic change.

Other terms that may be heard in this context are penetrance, the % of the population with a genetic variant that shows an associated trait. In some cases penetrance can be quite low meaning other factors are likely involved. If every individual with that variant has the trait there is complete penetrance. Even with complete penetrance some individuals may be more or less severely affected, and this variable is described as expressivity. (Note expressivity is measured only with complete penetrance.)

As our understanding of inherited disease increases, identifying individual genes responsible for each disease is not going to be possible for many illnesses. There is however, a strong genetic component to their occurrence. This is where a comprehensive open health registry can be of greatest value. If we can

go back through generations of dogs – not just in a linear fashion but looking at siblings, aunts, uncles etc. patterns begin to emerge. If one problem appears repeatedly in a particular line, tapping into one where it has not appeared for generations is a possibility to reduce frequency of the problem.

Dog breeding is becoming increasingly multinational with frozen semen and surgical implantation. We are increasingly less likely to have hands on experience with every dog we are considering and its extended pedigree. We may not have all the answers ever, but the more pieces we have of a puzzle the better informed we can be to create dogs that are not just superior in structure and type, but also health and temperament.

Our goal continues to be full participation and data on every Beardie whether or not it will ever be used in a breeding program it has been part of a breeding program. We therefore discourage selectively entering only certain dogs, we want them all!

BeaCon encourages breeders to enroll pups in BeaCon's 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.

The inclusion of dogs in this registry is by the free choice of the owner/co-owner. Absence of dogs from this registry is also by the free choice of the owner/co-owner. Notice of the registry's availability is made through BeaCon's newsletter (Lighting the Way) and web site (www.beaconforhealth.org), and Beardie internet lists.

Notice of Copyright

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

Linda Aronson
Peg Caldwell
CJ del Valle
Karen Drummond
Sharon Dunsmore
Judy Howard
Elsa Sell

April 2011

WebSite.

The website (www.beaconforhealth.org) is being refurbished for a more modern look, better organization, a search utility, and more up to date links. It is expected the work will be complete by early summer. Your comments and suggestions for additional links are welcome to the webmaster (beaconbb@bellsouth.net).

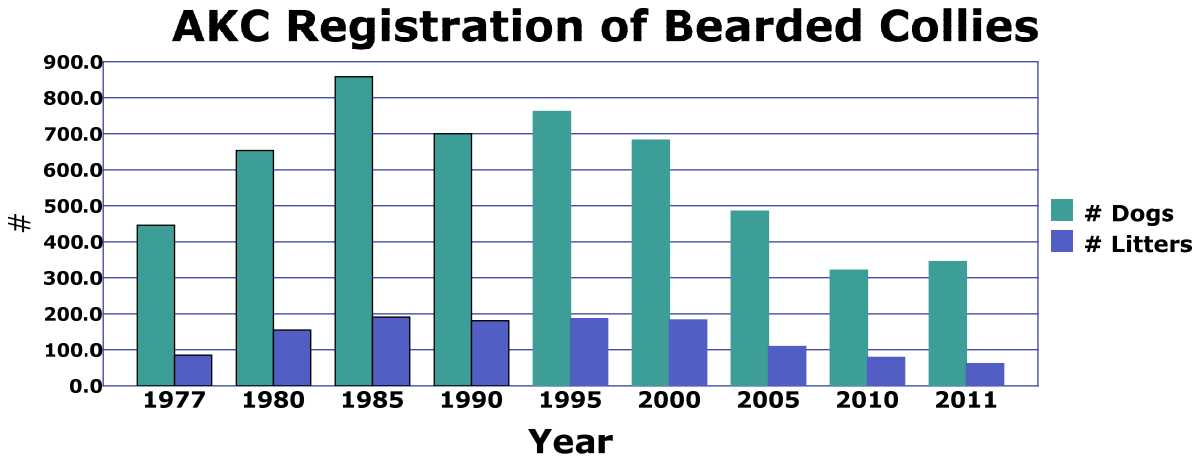
Registration Statistics for Dogs, Litters, and Pups

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.

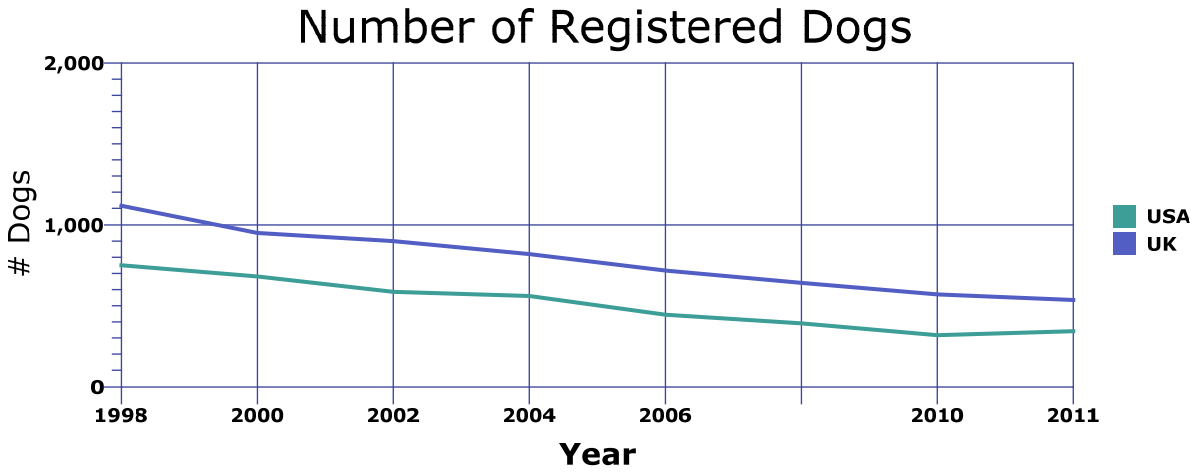
1) In 2011 the number of AKC registered litters, pups in litters, and dogs was fewer than in 2010, and still below the 1977 numbers. It is possible that some litters born in December 2011 were not yet registered when the report was generated. This will be corrected in next year's report as necessary.
2) Denise Barley provided the UK figures.

	USA - AKC				UK - KC		
Year	# Dogs Registered	# Litters Registered	# Pups in Litters	Av # pups/ Litter	# Registered	# Litters	av# pups per litter
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	-	-	-	-			

AKC Registrations – 5 years Intervals
For those interested in the figures for each year, refer to the previous table.



Comparison of AKC Registrations (USA) and KC Registrations (UK) at 2 Year Intervals from 1998



The above graph shows a parallel decline in the number of Registered Bearded Collies in the UK and the USA between 1998 and 2011. Where this will end, no one knows, although it is heartening to see less decline in the last few years.

THE OHR – Owners, Dogs and Registry Years

Number of Owners and Dogs
There are 729 participating owners, an increase of 80 over last year, and 2053 Beardies, an increase of 307. There is little change in the frequency of the most common health problems; fear issues and autoimmune problems continue to lead the list, although their order is reversed. The frequency of health

screens is also little changed. Puppy mortality is 5% stillborn and an additional 7-8% dying by 6 weeks of age. The following table shows the cumulative participation over the years.

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

Geographic Location

These are arranged in descending order by number of owners in a country. The overall increase in owners was 80 with the largest percent from the UK (28.5%) and the Netherlands (22.5%).

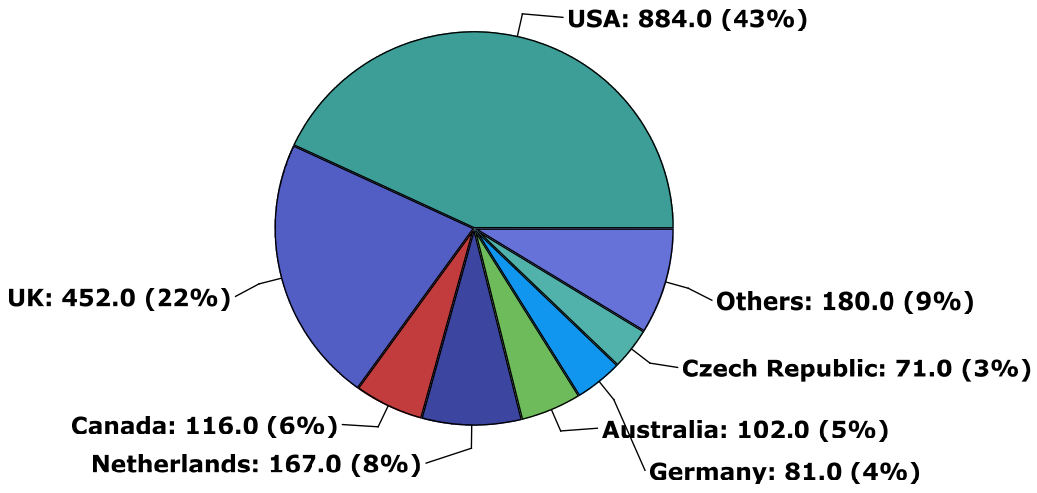
Country	Owners (#)	Dogs (#)	Dogs (%)
USA	381	884	43.1%
UK	138	452	22.0%
Canada	42	116	5.7%
Netherlands	40	167	8.1%
Germany	30	81	4.0%
Czech Republic	24	71	3.5%
Australia	21	102	5.0%
Others*	53	180	8.8%
Total	**729**	**2053**	

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

Country Contribution of Dogs.

Compared to last year, the largest percentage increases by country were: the Netherlands 44%, Finland 30%, UK 18%, and Germany 16%. The USA decreased by 4 percentage points.

Location of Dogs



General Dog Information (2053 Beardies)

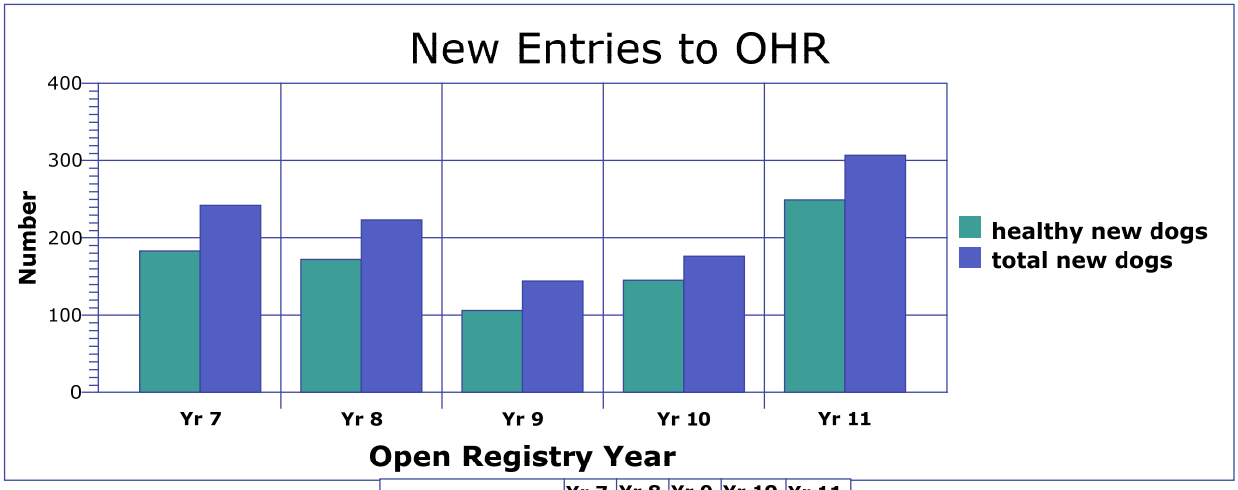
Sex and Reproductive Status

These figures are similar to those in past years although the percentage of intact males was slightly higher.

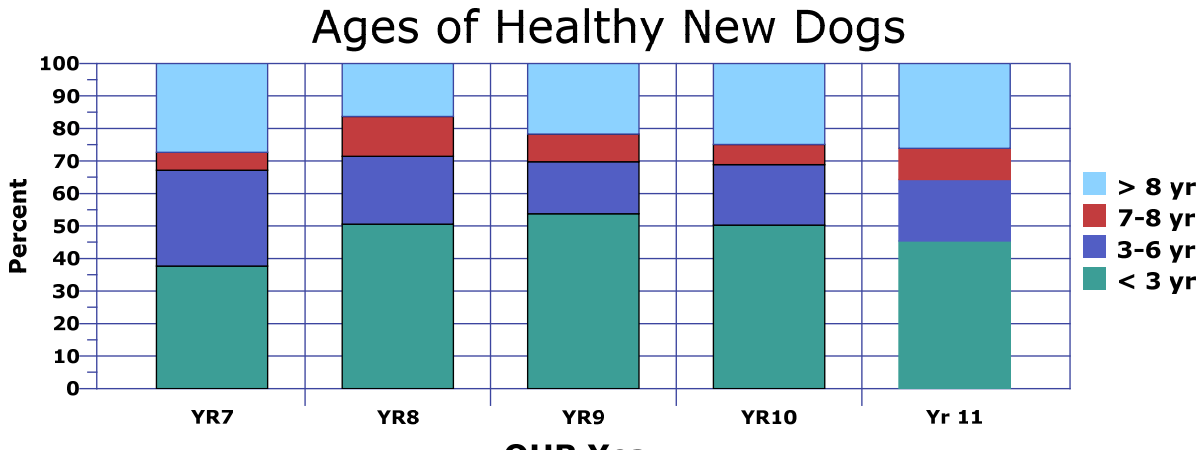
Sex	# Dogs	%
Male	926	45% of total
Intact	556	60% of males
Neutered	356	38.5% of males
Unspecified	14	
Female	1128	55% of total
Intact	583	51.7% of females
Spayed	536	48.3% of females
Unspecified	9	

Healthy

The percentage of healthy dogs in recent registry years is given in the two figures below. 1168 (56.9%) dogs have no health issues recorded as of February 15, 2012.



	Yr 7	Yr 8	Yr 9	Yr 10	Yr 11
healthy new dogs	183	172	106	145	249
total new dogs	242	223	144	176	307

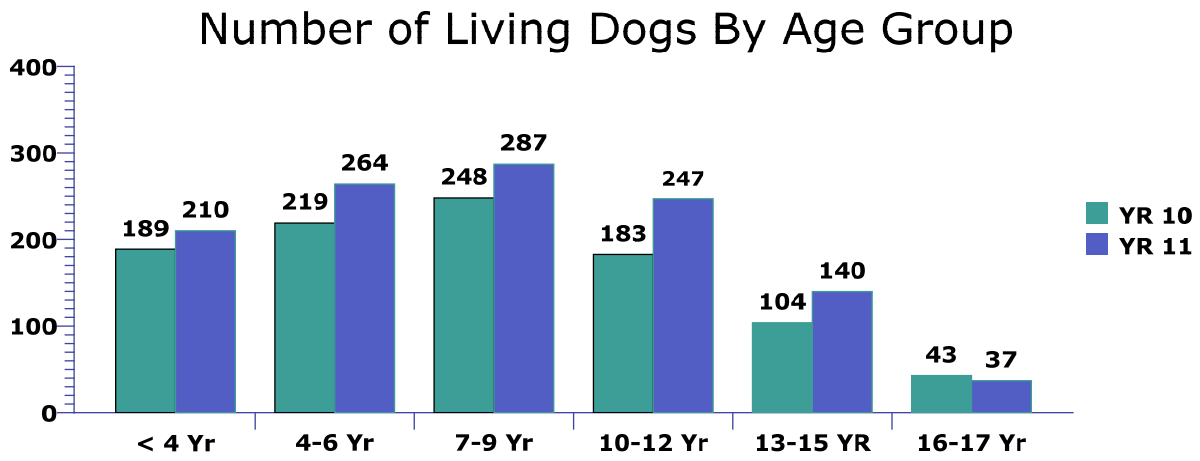


	YR7	YR8	YR9	YR10	Yr 11
< 3 yr	37.7	50.6	53.8	50.3	45.4
3-6 yr	29.5	20.9	16	18.6	18.9
7-8 yr	5.5	12.2	8.5	6.2	9.6
> 8 yr	27.3	16.3	21.7	24.9	26.1

The second graph shows that 73% or more of new healthy dogs entered in the last five years were under the age of nine years and in the last four years 45% or more were below the age of three years. The youth of new entries provides an excellent opportunity to follow their health over the long term.

Ages of Live Dogs in Registry

Age of dogs using 2/23/12 as the current date was calculated for 1228 dogs below the age of 18 years and last recorded as alive. The average age is 8.5 years. Breakdown by age groups is given in the chart below.



Health Problems.

Frequency is calculated if there are more than 25 cases. Autoimmune diseases remain the most common problem though dropping by 1 percentage point probably because of the larger denominator of healthy younger dogs entered this year.

Health Problem	# Dogs	% Dogs
Autoimmune diseases	234	11.4%
Fear, loud sharp noises	197	10.0%
Cancer (all types)	147	7.2%
Hypothyroidism	129	6.3%
Umbilical hernia	69	3.4%
Hip dysplasia	55	2.7%
Dietary allergy/food intolerance	41	2.0%
Cataract	35	1.7%
Aggression, all types	32	1.6%
Atopy	29	1.4%
Depigmentation	28	1.4%
Inflammatory bowel disease	27	1.3%
Fear, other	26	1.3%
Nail problems, other	26	1.3%
Allergy, flea bite	25	1.2%
Hearing loss	24	
Pyometra	24	
Teeth, overshot	18	
Cryptorchid	18	
Vaccination reaction	17	
Cushing's disease	17	
Cognitive dysfunction	16	
Kidney failure	15	

Hot spots	15	
Monorchid	14	
Hyperactivity	13	
Obsessive compulsive	12	
Epilepsy, idiopathic	12	
Exercise induced collapse	9	
Diabetes mellitus	3	

Note: Some cases of depigmentation can be autoimmune in nature (e.g., vitiligo, or associated with lupus or pemphigus). Since there are other causes of depigmentation, it was not placed into the table with autoimmune diseases.

Cataracts. 35 had cataracts and an additional six had punctate cataracts (Category E) – age of onset wasn't given for five and it was under the age of eight in just 9. Among the others there was one with bilateral juvenile cataracts; the type was not specified for the others.

The incidence of autoimmune thyroiditis in the open health registry dogs remains unknown; data from OFA labs through December 2011 suggest it is relatively low – 1.3% of 537 having OFA panels (with 0.9% idiopathic hypothyroidism, 12.1% equivocal, 85.7% normal)..

The more frequent location of cancer is listed on the next page (see the online OHR search facility for a look at the less common cancers - select cancer, other). To assure an accurate count, the cancer causes of death are checked against a dog's health problem list. If such a diagnosis had not been added to the health problem list by the owner, it was added by the database administrator.

There were 62 cancers marked as "other"; no one location was predominant among those cancers. The type of cancer within an organ/location was sometimes documented because of pathology exam; more often it was not. The necropsy rate is low for all deaths. Often either the primary site of the cancer is unknown or a diagnosis is "suspected" cancer. As a result of low necropsy rate, few pathology exams, and other factors, the prevalence of cancer and the type of each cancer within the breed remains uncertain.

mammary – 16
liver – 13
spleen – 12
nasal – 11
stomach - 9
bone - 7
hemangiosarcoma – 5

Autoimmune (A/I) Disease

The number of individual A/I diseases was 264. The number of dogs having A/I disease(s) was 234, or 11.4% of all dogs. There was a small increase in the number of cases for most diseases this year; the increase for SLO was greater, likely due to the research focus on SLO for the past 2 ½ years. Hypothyroidism is not included in A/I diseases because there is insufficient information available to know that the disorder was autoimmune based. The frequency of the A/I disease was unchanged among all dogs and those with A/I disease.

Disease	#	% of All Dogs	% of A/I Dogs
Addison's disease (hypoadrenocorticism)	76	3.8	32.5
Symmetrical lupoid onychodystrophy (SLO)	71	3.5	30.3
Inflammatory bowel disease (IBD)	27	1.3	11.5
Autoimmune hemolytic anemia (AIHA)	25	1.2	10.7
Systemic lupus erythematosus (SLE)	19	1.0	8.1
Rheumatoid arthritis*	14	0.7	6.0
Immune-mediated thrombocytopenia (ITP)	13	0.6	5.6
Pemphigus	7		
Discoid lupus erythematosus	7		
Myositis	3		

* These include cases of suspected immune polyarthritis

Twenty-five dogs had more than one disease

20 dogs had 2 A/I diseases

7 dogs had 3 A/I diseases

3 dogs had 4 A/I diseases

Addisonian dogs

16 (21.1%) are hypothyroid

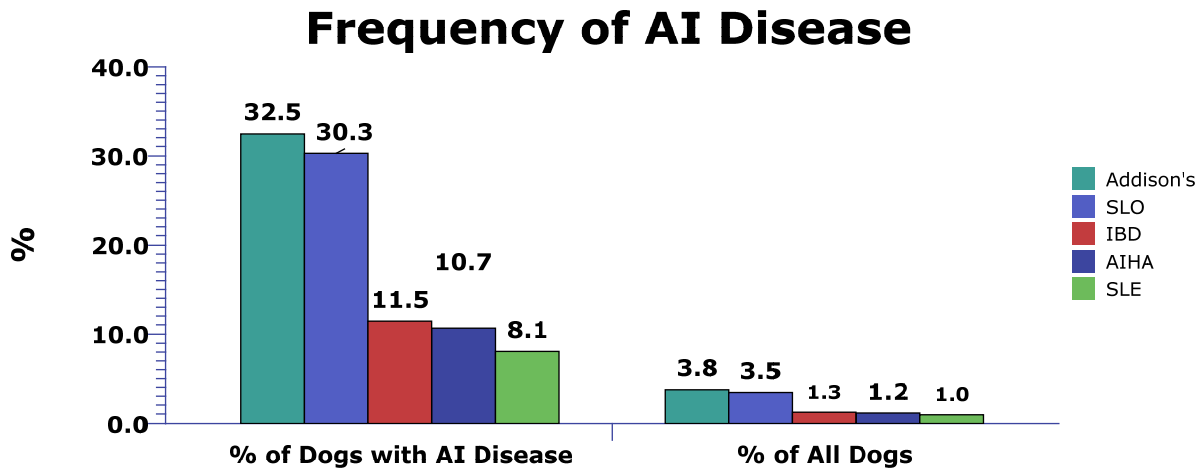
21 (27.6%) have fear of loud sharp sounds

SLO dogs

6 (8.5%) are hypothyroid

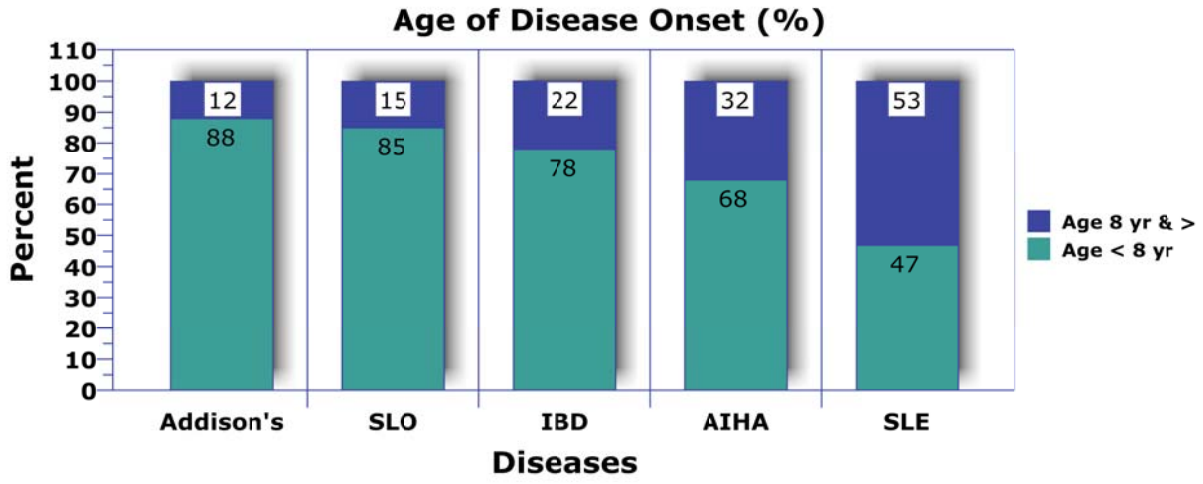
A/I diseases – charts

Frequency of Most Common A/I Diseases



The frequency of the different AI diseases is the same as last year with Addison's disease and then SLO leading the list.

Age of Onset of Most Common A/I Diseases



As in previous years, Addison's, SLO, and IBD had earlier onset than AIHA and SLE, using below and above 8 years of age as the division point for early and late onset.

Screening Test Done	#	% of All Dogs
Hips	751	36.6
Eyes	625	30.4
Thyroid	445	21.7
Elbows	181	9.0
Hips and eyes	370	18.3
Hips and thyroid	210	10.2
Hips and elbow	175	8.5
Hips, eyes, and thyroid	169	8.2
MDR-1	24	
DLA	18	
Von Willebrand Disease	11	

The frequency of individual health screening tests declined slightly for hips, eyes, and thyroid. DLA (dog leukocyte antigen) haplotype testing is a recently available screen in Europe and this test was done on 18. The frequency of various test combinations was similar year to year.

Reproductive Outcome

Dogs. There were 143 with reproductive history recorded; 62 had semen checked but most gave no information about semen quality. The following table shows the number of bitches bred, the number of litters and puppies produced.

Item	#	Av
Bitches bred	562	4
Litters produced	501	3.5
Total puppies produced	2927	20.5
Total female puppies produced	1269	8.7
Total male puppies produced	1345	9.4

Every breeding did not result in a pregnancy. 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.

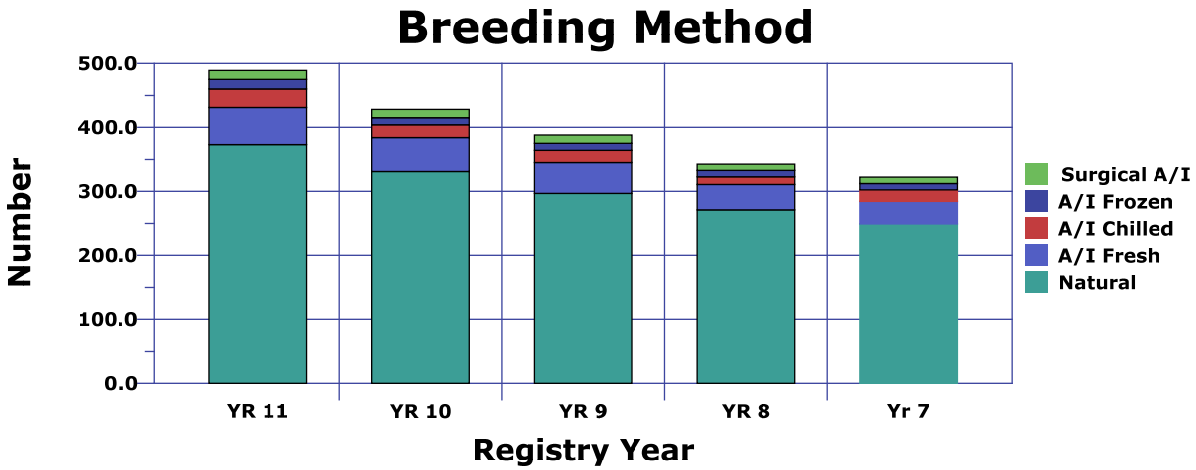
Later Health Problems in Dogs' Progeny.

Health Problem	# dogs producing problem	# progeny with problem
Addison's	8	19
Symmetrical lupoid onychodystrophy	9	14
Systemic lupus erythematosus	2	2
Hypothyroid	10	12
Cryptorchid	20	46

Other problems produced by 16 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.

Bitches. 323 bitches were bred with 520 litters and 3404 pups produced. Cesarean section delivery was done in 59 (18.0%).

Breeding Methods Resulting In Live Pups.



	YR 11	YR 10	YR 9	YR 8	Yr 7
Natural	373	331	297	271	249
A/I Fresh	58	53	48	40	35
A/I Chilled	29	20	19	12	18
A/I Frozen	15	11	11	10.0	10
Surgical A/I	14	13	13	10.0	10

Additionally, there were 15 (4.6%) bred with a combination of natural and A/I fresh; for 45 the method of breeding is not known.

Progeny and Early Identifiable Issues.

Male pups		
	#	% of total
total born	1764	-
live born	1624	92.1%
live @ 6 wks	1506	85.4%
		% of those alive at 6 weeks with
cryptorchid	86	5.7%
mismark	72	4.8%
umbilical hernia	59	3.9%
bad bite	15	
poor pigment	14	
cleft palate	3	
Female pups		
	#	% of total
total born	1640	-
live born	1523	92.9%
live @ 6 wks	1410	86.0%
		% of those alive at 6 weeks with
mismark	75	5.3%
umbilical hernia	62	4.4%
bad bite	15	
poor pigment	6	
cleft palate	2	

Later Health Problems in Bitchs' Progeny.

Health Problem	# dams	# progeny
Addison's	13	19*
Symmetrical lupoid onychodystrophy	11	14
Systemic lupus erythematosus	4	3
Hypothyroid	11	10
Other	33	25**

* One bitch produced 6 Addisonian puppies

** 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
- 1 each - hyperthyroid, discoid lupus, autoimmune hemolytic anemia, pyelonephritis (early death at 3 wks), kidney failure (several died as young dogs), myositis, hip dysplasia, ulnar shortening.

There is a need for puppy owners, breeders, and stud owners to have better communication about health problems. Until that happens, there will continue to be gaps in knowledge of progeny health problems that may be heritable.

Mortality

General Information

The only departures this year in reporting mortality from previous years have been:

1. Separation of the age group 9-14 years into two groups because that has represented close to 50% of all deaths.
2. Percentage of deaths in each age group is calculated by # deaths/total deaths regardless of whether or not the cause of death was given.

The relatively high proportion of deceased dogs is probably due to the large number of elderly Beardies in the registry and an improved rate of updating this year. There are 554 (26.50%) deaths reported. For the 536 dogs with known date of death, the average of death was 11.9 yrs., the minimum was 0.1 yr, the maximum 17.6 yrs.

Necropsies were conducted on 34 (6.1%). Owners should remember 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 83, euthanasia in 420, accidental in 20, and not documented in 31.

Owners sometimes provided only 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.

The leading causes of death before 9 years of age were autoimmune (n=24), accidental (n=14), and cancer (n=11 in the 7-8 yr group). The high number dying from autoimmune disease at a young age is of concern and should be the focus of research to identify cause(s) and trigger(s), and hopefully elimination of these problems where feasible.

The overall percentage shown for each age used 536 dogs as the denominator

Age Group – up to 3 yr

There were 18 deaths (3.4%)

- Accidental – 4
- Autoimmune – 27.8% of age group: 1 each pemphigus/SLO, IBD, Addison's, immune mediated polyarthritis, AIHA
- Aggression, directed at dogs' family – 2
- 1 each intussusception (after hemorrhagic gastroenteritis), meningitis, kidney failure, pyometra, myocarditis
- Unknown - 2

Age Group – 3-6 yr

There were 43 deaths (8.0%)

- Autoimmune - 11 (27.5% of age group)
    - SLE – 3
    - AIHA – 3
    - 1 each: SLO with aggression due to pain, ITP, Evan's syndrome (ITP & AIHA), Addison's, IBD
- Accidental – 6
- Cancer – 6 (14% of age group)
- Unknown - 5
- Acute renal failure - 2
- 1 each: chronic interstitial nephritis, respiratory failure (in an Addisonian), acute fulminating pancreatitis after whelping, neurologic other (had hip dysplasia and developed rear paralysis from a pinched nerve), liver failure, sudden acute retinal deterioration (unable to deal with visual loss), chronic pancreatitis, aspiration pneumonia, atopy, idiopathic epilepsy, poisoning, aggression

Age Group – 7-8 yr

There were 41 deaths (11.5%)

- Autoimmune – 10 (24.4% of age group)
    - 4 – Addison's (either primary cause or associated)
    - 2 – AIHA
    - 1 each – autoimmune muscle disease, rheumatoid arthritis, SLE, SLO
- Cancer – 9 (22% of age group)
- Unknown – 9
- Accidental – 5
- 2 – renal failure
- 1 each: family aggression, pet food poisoning, rear end paralysis, sudden breathing distress, pyometra, amyloidosis

Age Group – 9-11 yr

There were 112 deaths (20.9% of total deaths)

- Cancer – 42 (37.5% of age group)

- Autoimmune – 12 (10.7% of age group)
    - Addison's – 4
    - AIHA - 5
    - 1 each – SLE, discoid lupus, ITP
- The remainder were either unknown or a few cases of a wide range of health problems – including several with heart failure and several with Cushing's disease

Age Group – 12-13 yr

There were 152 deaths (28.4% of total deaths)

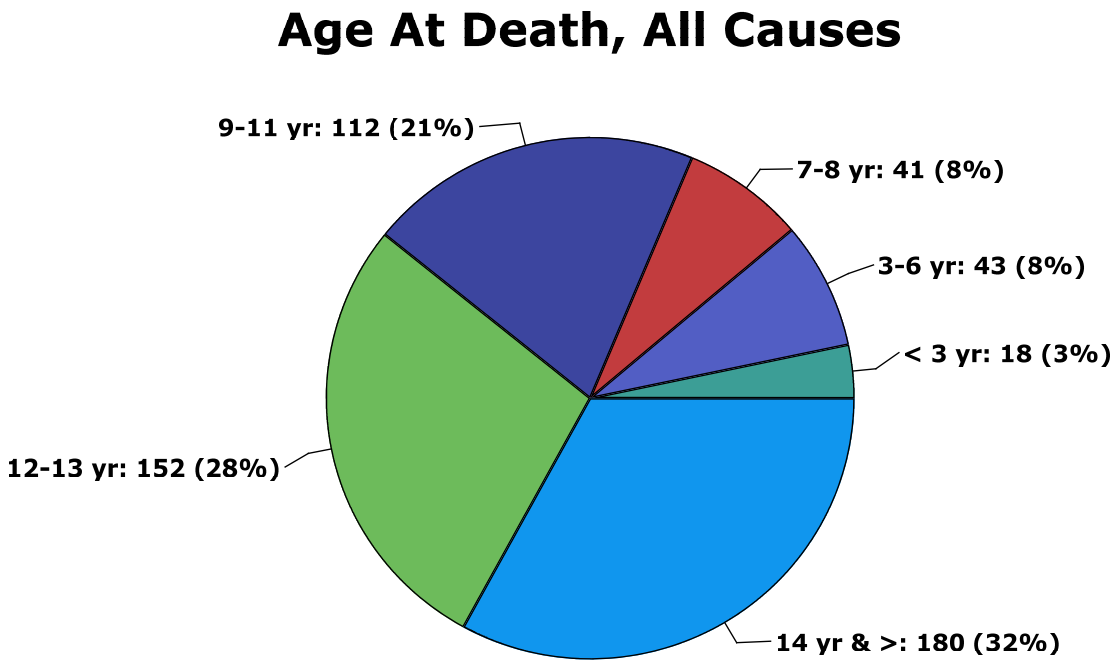
- Cancer – 39 (25.7% of age group)
- Old age – 24 (15.8% of age group)
- Kidney failure, unknown cause – 9
- Stroke – 7
- Autoimmune – 7 (4.6% of age group)
    - Addison's – 5
    - SLE – 2
- The remainder were either unknown or 1-few cases of a wide range of health problems

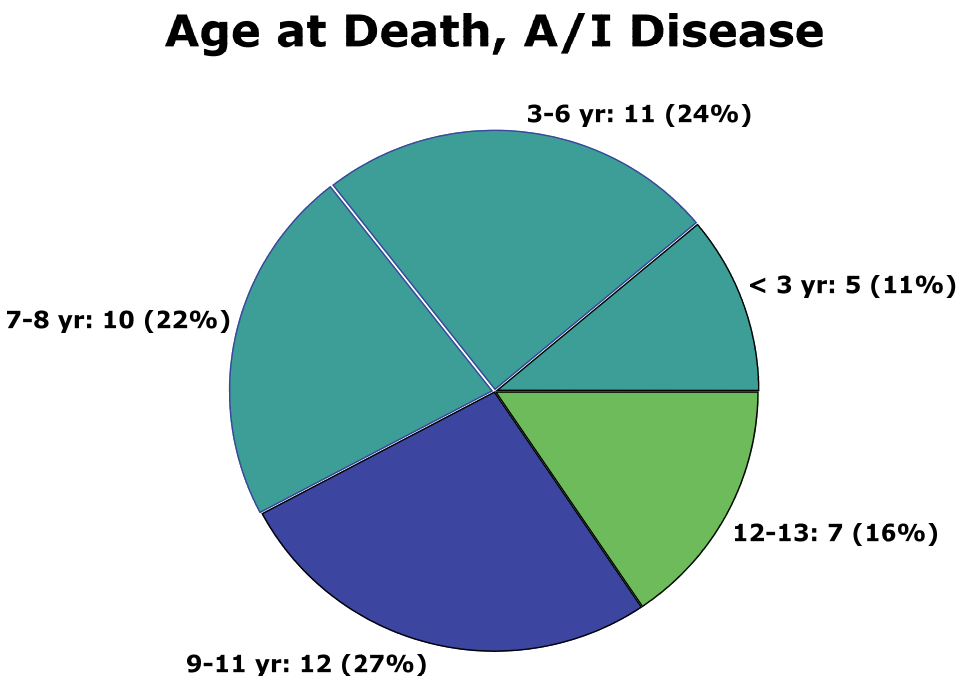
Age Group 14 yr and above

There were 180 deaths (33.6%)

- Old age - 88 (48.9% of age group)
- Cancer – 28 (15.6% of age group)
- Stroke – 10
- The remainder was either unknown or single/few cases of a wide range of health problems.

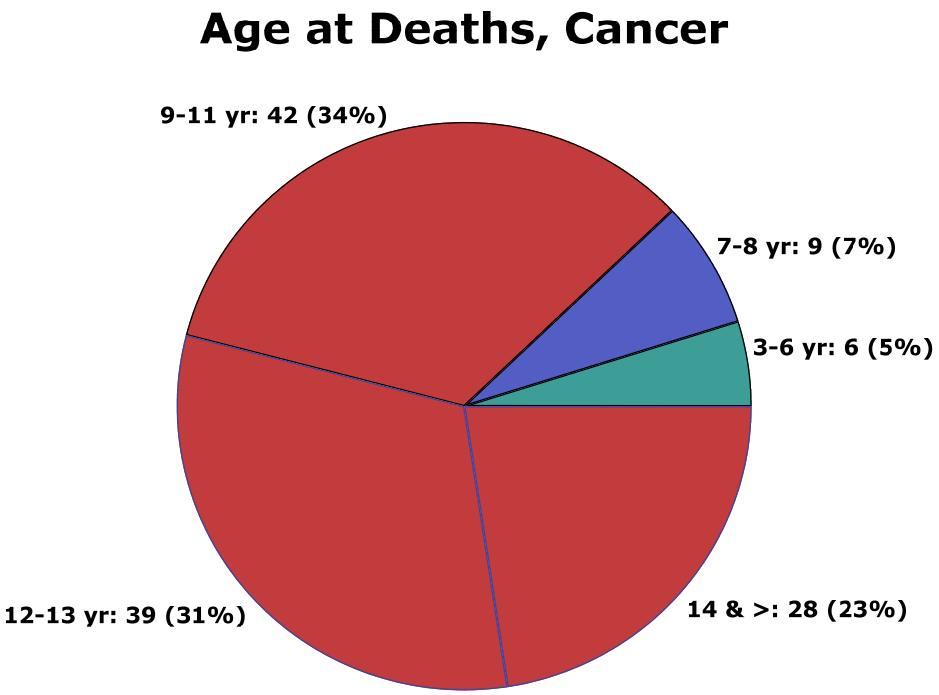
Charts – Age at Death, general; A/I Disease; Cancer





Although only 19% of all deaths occurred before 9 years of age, 57% of these were due to autoimmune disease, as shown in the turquoise color of the second chart.

The reverse is true for cancer as the cause of death; 88% of cancer deaths were over the age of 8 years as shown in the red color of the chart below. This finding is the same as reported in previous years.



Coefficient of Inbreeding (COI)

The COI values were calculated using the Breeder's Assistant (BA) Pedigree Software for ten generations of ancestors. 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.

Others using different pedigree software may obtain different COI's for ten generations. All software state that the original Wright's coefficient is used; however, the algorithms used for the COI calculation probably vary slightly to account for the differing values that have been brought to our attention.

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 breedings. There were 939 Bearded Collies registered as foundation stock as of October 1, 1976.

The data are arranged by decreasing COI for individual country's dogs. Given the large standard deviations, the differences between countries are not significant, but just reflect the current breeding pool. Almost all countries have a maximum COI over 40; the two exceptions are the Netherlands with a maximum of 37.5 and Finland with a maximum of 31.4. All countries have a minimum COI of 9-14 except for the UK which is zero, due to one breeder who is utilizing non-KC registered sires in their breeding program.

Year Report/Other	Coefficient of Inbreeding				
	# 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 11					
All dogs	2508	23.3	0	47.5	6.3
UK	436	24.7	0	43.2	7.1
USA	868	23.7	11.2	43.9	5.6
Canada	114	23.3	9.2	47.5	6.8
Belgium	26	22.3	14.3	38.9	6.7
Finland	43	22.1	9.9	31.4	5.7
Czech Republic	70	22.0	11.2	47.3	6.1
Australia	102	21.6	10.8	42.1	5.3
Netherlands	161	21.3	9.2	37.5	5.4
Germany	80	20.4	8.9	42.4	6.6

Research

The SLO survey project continues. The family pedigree data have been provided to Dr. Anita Oberbauer's lab for statistical analysis of possible mode of inheritance. The environmental data have been reviewed by Dr. Patrick Horan; he, like Dr. Oberbauer recommend gathering similar environmental data on a group of healthy older Beardies without SLO or any chronic nail condition. That project is to begin shortly.

DNA samples continue to be collected and stored by Dr. Anita Oberbauer's lab. These will be utilized for research into Addison's disease and/or SLO, depending on technology advances. The board of directors continues to encourage every Beardie owner who has a dog with one of these diseases to submit DNA samples (see links below) and all Beardie owners who have healthy dogs or at least dogs who are free of chronic health issues that require regular veterinary attention, and who are age 8 or beyond to submit DNA for the SLO study.