

The 2018-2019 Rainbow Bridge Survey Report

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EXECUTIVE SUMMARY

We present herein the results of the 2018-2019 Rainbow Bridge Survey, the follow-on to the 2017 Longevity Survey which measured the lifespan and survival rates of Havanese from a sample of 156 males and females. In combination with the age distribution of a sample of 512 living Havanese, the 2017 Survey presented the first evidence that the lifetime distribution of both males and females was consistent with being bimodal, having a small component (approximately 20%) of the male and female population with a significantly shorter lifespan (peaking around 9 to 10 years of age) than the balance (peaking at ~13 years).²

The Rainbow Bridge Survey was conducted to attempt to uncover the origin of this bimodal distribution, by exploring the specific causes of death as a function of age from a second sample of 156 Havanese. As the samples used in both Surveys were provided anonymously, there may be some overlap in the populations. This however will not impact the results, as the second survey addresses a different set of questions. At each step of the process, we have attempted to reduce bias, but it is important to keep in mind that with the low statistics, there is no method we can apply to test how well the survey population reflects the population at large.

The 156 dogs in the survey represented 87 distinct owners and/or responders of which 35 were HCA members and 31 were past or current breeders. Almost all (91%) of the Havanese in the survey were registered with the AKC. There were 118 dogs with a spay or neuter age reported and another 32 which were spayed or neutered but did not report a known age. Of the dogs with a spay/neuter age reported, about ½ the males, and 1/3 of the females were neutered / spayed respectively after age 2 years, again suggesting that a modest proportion of dogs in the

¹ The 2018/2019 HCA Health Committee: Chair: Dr. Rafe H. Schindler. Members: Mary Cane, Sara Dellorto, Natasha Ghearing, Kim Gillette, Dr. Adam King, Kathleen King, Lucy Lancaster and Joan Little

² A consequence of this, is that once you passed this early threshold, the average lifespan increased. A dog for example that survived to 12 years of age would have an average lifetime of 15 years.

survey were being used in breeding programs (and thus consistent with the makeup of the pool of responders).

The new survey yields male and female average lifetimes consistent with but slightly shorter than those reported in the Longevity Survey. The average lifetime for 156 males and females is 12.0+/-0.3 years. Individually, the 84 females and 72 males have average lifetimes of 12.1+/-0.5 and 11.9+/-0.4 years, respectively. The systematic error on average lifetimes is estimated to be an additional +/-0.3 years, similar to the Longevity Survey. These lifetimes are well below what we describe as the “natural lifespan” of Havanese, ~15.1 years, as discussed in the final section of the report.

The new survey confirms the observation that the lifetime distribution is not a simple Gaussian one, but has significant contributions from two (or more) health issues which contribute to death earlier than the natural lifespan. These skew the lifetime distribution downward, as was seen in the Longevity Survey.

As a percent of the total survey population, the two most prominent issues identified, and which result in these earlier mortalities are cancers (26+/-4%) and cardiovascular diseases (27+/-4%). The most frequently reported cardiovascular conditions are known to appear first in midlife and subsequently lead to death – often via congestive heart failure. There is however no dominant form of cancer that can be identified here as a primary cause of death, but the most frequent types reported are: Liver/Spleen, followed by B- or T-cell Lymphoma, and finally Leukemia. Cancers occur more frequently in the male population (37.5+/-8.5%) compared to females (17.9+/-5.0%) while cardiovascular diseases overall are more prevalent in the female population (35.7+/-7.6%) compared to the males (22.2+/-6.1).³ The latter difference between males and females for all cancer related deaths⁴ has a statistical significance of ~2.78 standard deviations (or a 1 in 386 chance of being a fluctuation). The statistical difference for cardiovascular related death rates (see footnote 4) between males and females is ~2.84 standard deviations (or 1 chance in 476 of being a fluctuation).

For males and females, the mean age at death from primary cancer is 10.3+/-0.5 years (well below the overall mean lifetime). From primary cardiovascular causes it is 12.4 +/- 0.4 years, close to the mean lifetime of the full survey population but well below the ages that long-lived dogs survive to. While the rate of occurrence is different for males and females, there is no statistically significant difference in the lifetimes between males and females, in either of these disease categories.

The next smaller contributor to early mortality appears to be non-cancerous diseases of the liver. They occur at a significantly lower frequency (5.8+/-1.9%) in the total population and with no statistically significant difference between sexes. They result in an average age at death of 6.9+/-1.1 years. Somewhat surprisingly, these are reported primarily as chronic liver disease

³ Only the most prevalent conditions reported occur at a somewhat closer to equal rate in males and females.

⁴ Here the small additional number of secondary and tertiary cancer and cardiovascular occurrences are included.

and Hepatitis as opposed to Microvascular Disease (MVD) or Portosystemic Vascular Disease (PSVD). About an equal number of cases of liver cancer (reported in the Cancers category) were also observed but resulting in death at a much later average age of 9 ½ to 10 ½ years.

Examining the longer-lived end of the mortality curve, 9.6 % of the total survey population died naturally of an unknown (undiagnosed) cause with an average lifetime of 14.7+/-0.4 years. A small fraction of all dogs (8.3%) were euthanized for quality of life issues (without any underlying diagnosis being reported). Their average age was 15.3+/-0.3. In both these cases there were almost an equal number of males and females in the sample.⁵

Kidney disease/failure stands out as a leading component of mortality in the older dogs. As a primary cause it occurs in 9.6+/-2.5% of the survey population and leads to death at about 14.2 +/-0.9 years. It appears as a primary, secondary or tertiary cause in an almost equal number of males and females.

The final large category is neurological causes. When reported as the primary cause of death it appears in about 5.8+/-2.0% of the survey population. While spread out widely in age there is some suggestion of possible enhancements at younger and older ages which depend on the detailed cause (e.g.: dementia). The overall average age at death however is 10.8+/-1.6 years. The frequency is statistically similar for males and females. They appear as well as secondary and tertiary causes.

All other primary categories combined, make up a small percentage of the total survey population (7.7%) and tend to be widely spread out in the age of their impact. They will be discussed separately in the balance of the text.

The survey also examined health correlations with factors such as the age at neuter/spay and lifestyle. While no statistically discernible differences in lifespan nor cause of death was observed with spay/neuter age, there is evidence that dogs in rural environments (versus urban and suburban) have longer average lifetimes. The latter observation requires confirmation by a separate study with both higher statistics and more precise definitions of lifestyles.

Finally, the survey attempted to define *the natural lifespan of Havanese* based on data from three of the primary categories. We found a value of 15.1+/-0.4 years based on 41 dogs in the survey sample.

The dissemination of this report has been approved by the Board of Directors of the Havanese Club of America, Inc.

⁵ Euthanization is listed in the survey as a secondary cause of death, when the primary cause is known.