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Variation in activity levels amongst dogs of different breeds: results of a large online survey of dog owners from the United Kingdom

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35 **Abstract**

36

37 Regular physical activity is an important means of promoting health, both in people and their pets.
38 Walking is the most common method used for dogs, but there is a lack of clarity on how much **daily**
39 activity different breeds of dog require. Data from an online survey of UK dog owners were
40 collected between June and August in 2014. The University of Liverpool Ethics Committee
41 approved the project, and owners consented to data use. The initial dataset (17,028 dogs) was first
42 cleaned to remove erroneous data, and then edited to remove mixed breed dogs, leaving a total of
43 12,314 dogs from known pedigree breeds. Other information collected included sex, age, neuter
44 status, breed, and amount and frequency of exercise. Exercise frequency and duration were
45 estimated across different breeds, and compared with Kennel Club recommendations, using Chi-
46 squared tests and binary logistic regression.

47

48 The online survey data indicated differences amongst breeds in the amount of walking reported
49 ($P < 0.001$). Afghan Hounds were the least exercised breed, whilst breeds reportedly exercised most
50 included: English Setter, Foxhound, Irish Setter, and Old English Sheepdog. Gundogs were most
51 likely to be walked once a day or more ($P < 0.001$), whilst smaller dogs were more likely to meet
52 their UK Kennel Club guidelines for dog walking ($P < 0.001$). The frequency of dog walking varies
53 both within and amongst breeds, and many do not currently receive the recommended amount of
54 exercise. This may constitute a canine welfare problem and also impact the physical activity levels
55 of their owners.

56

57

58 **Introduction**

59

60 Regular physical activity is an important means of promoting health in people.⁽¹⁾ A similar
61 recommendation is made in dogs, but there is a lack of clarity on how much different breeds of dog
62 require, and no current evidence-based guidelines are available.⁽²⁾ The US Department of
63 Agriculture recommends that dogs should have at least 30 minutes of exercise per day; however,
64 this recommendation mainly came from anecdotal evidence and expert opinion guidelines.⁽³⁾ In the
65 UK, the Kennel Club has published recommendations regarding activity requirements for different
66 breeds.⁽⁴⁾ However, once again, these recommendations are not taken from scientific evidence but
67 based on opinions from the breed clubs. There is generally a positive association between size of
68 the dog and exercise recommendations i.e. the bigger the dog, the more exercise it is perceived to
69 require.

70

71 Before recommendations can be made regarding the optimal amount of activity different breeds
72 require, it is first necessary to determine current activity levels and what determines them. In a
73 recent review of the correlates of dog walking, there was some evidence of smaller dogs being
74 walked less than bigger dogs, although the association was not clear.⁽⁵⁾ There was also no evidence
75 available regarding the influence of specific breed beyond broad type groupings; this was probably
76 due to the size of the dataset available, which limited the ability to perform individual breed
77 analyses. The aims of this study were to investigate differences in the amount and frequency of
78 exercise amongst dogs of different breed, and to determine the proportion of dogs within each breed
79 that meet current recommendations.

80

81 **Methods and Materials**

82 *Study design*

83 An online survey of UK dog owners was conducted between June and August in 2014, in
84 association with the broadcast of a 3-part Channel 4 television documentary series, "Dogs: Their
85 Secret Lives". Information was gathered from owners about the signalment of their dog (age, sex,
86 neuter status, and breed), body weight, whether or not the dog was overweight, lifestyle, activity,
87 and behaviour. The main questions considered in the current study are those regarding activity,
88 breed and other signalment details. The data on exercise have also been used in a separate study
89 examining the associations between exercise and overweight status,⁽⁶⁾ whilst the questions relating
90 to behaviour are reported elsewhere.⁽⁷⁾

91

92 For owner responses, most questions involved either checking boxes or using drop-down menus.
93 The main questions used in the current study were on breed and activity. Breed of dog was
94 indicated using a drop-down list of UK breeds. For exercise frequency, the question asked was
95 "How often do you exercise your dog outside of your home or garden?" and respondents could
96 select: "more than once a day", "once a day", "4-6 times per week", "1-3 times per week", or
97 "never". For exercise duration, the question asked was "Each time you exercise your dog how long
98 is it for?" and respondents could select: "over an hour", "30 minutes to an hour", "11-30 minutes",
99 and "0-10 minutes". Respondents were also asked if the dog is let off the lead (yes/no).

100

101 The University of Liverpool Ethics Committee approved the study, and all owner participation was
102 voluntary, whereby owners who wished to complete the survey logged onto the Channel 4 website.
103 Further, owners gave permission for their data to be used, in a fully anonymised form (i.e. any
104 client-identifying data removed), and for the results to be publicised both on the TV shows and
105 online. They were not required to answer questions that they did not wish to answer. To be eligible
106 for inclusion in the data analysis part of the study, dogs had to be from a pedigree breed (based
107 upon the breeds officially recognised by the UK Kennel Club)⁽⁴⁾ and questionnaire information
108 needed to be complete **i.e. all questions used in the current study needed to be answered.**

109

110 *Data handling and statistical analysis*

111 All data were first entered into a computer spreadsheet (Excel version 14, Microsoft, Redmond,
112 Washington, USA), to enable data manipulation prior to statistical analysis. **Given that the study**
113 **involved a direct comparison of exercise amongst pedigree breeds, the data from** all mixed breed
114 dogs **were removed.** Breed data were then further categorised into breed-specific groups (e.g.
115 Pastoral, Gundogs, Hounds, Terriers, Toy, Utility or Working) and by size (e.g. small, medium or

116 large), according to The UK Kennel Club UK classification.⁽⁴⁾ Unlike for the related
117 manuscripts,^(6,7) data from dogs under 2y age were eligible for inclusion in the analysis for this
118 study. Outcome variables of interest included: frequency of exercise outside of the home/garden
119 (see categories above); walked once a day or more (yes/no); duration of usual exercise (see
120 categories above), and met UK Kennel Club guidelines of exercise for that breed (yes/no). The
121 latter outcome was created by comparing each dog's reported exercise with the activity
122 requirements for recommended by the UK Kennel Club for different breeds.⁽⁴⁾ Data analysis was
123 conducted in Minitab 17 and IBM SPSS Statistics 22. Chi-squared tests were used to compare
124 proportions of dogs amongst exercise categories. Given that multiple comparisons were performed,
125 a modified Bonferroni correction was applied.⁽⁸⁾ This correction effectively meant that statistical
126 significance was only considered when $P < 0.0042$. Caution should be taken when interpreting
127 findings as even in such a large dataset, numbers in each breed were often small, hence deeper
128 statistical analysis was not conducted.

129

130 **Results**

131 ***Final dataset***

132 Data were available from questionnaires of 17,028 dogs, of which 9480 were male (56%) and 7548
133 (44%) were female. 2849 dogs (17%) were <1 year of age, 4470 (26%) were 1-3 years old, 8206
134 (48%) were 3-10 years old, and 1486 (9%) were >10 years old. A total of 12,314 were pedigree
135 dogs, comprising 71 separate breeds, and the remaining 4,714 were mixed breed dogs (which were
136 not included in the data analysis).

137

138 ***Exercise frequency***

139 There was a difference amongst dogs of different breeds for the likelihood of being exercised at
140 least once a day ($P<0.001$; Table 1). The breeds which were most likely to be exercised once a day
141 or more were English Setter (20/20, 100%), Foxhound (20/20, 100%), Irish Setter (24/24, 100%),
142 and Old English Sheepdog (19/19, 100%), Hungarian Vizla (87/89, 98%). The breeds least likely
143 to be exercised once a day or more were Afghan Hound (5/10, 50%), Papillon (11/19, 59%),
144 Pyrenean Mountain (3/5, 60%), Bloodhound (n=3/5, 60%) and Chihuahua (101/162, 62%). The
145 frequency of exercise also varied amongst dogs of different breed groups ($P<0.001$; Table 2). Dogs
146 in the Gundog (3869/4325, 90%), Pastoral (1380/1585, 88%), and Hound (789/924, 85%) groups
147 were most likely to be exercised once a day or more; in contrast, dogs of the Terrier (2257/2793,
148 81%) and Toy groups (603/814, 74%) were least likely to be exercised 1/day or more. There was a
149 difference between the size of the dog and whether it received exercise once a day or more
150 ($P<0.001$), with large dogs (4380/5006, 88%) being more likely to receive exercise once a day or
151 more compared with medium (4105/4832, 85%) and small dogs (1948/2476, 79%). There were
152 also significant differences in the frequency of exercise amongst dogs of different ages (older dogs
153 < younger dogs; $P<0.001$) and neuter status (entire dogs < neutered dogs, $P<0.001$)

154

155 ***Exercise length***

156 There was a difference ($P<0.001$) amongst the breeds in the duration of exercise: Alaskan
157 Malamute (42/52, 81%), Beagle (181/225, 80%), Border Collie (671/840, 80%), Cocker Spaniel
158 (687/833, 82%), Dalmatian (88/99, 89%), German Pointer (101/107, 94%), Hungarian Vizla (74/89,
159 83%), Old English Sheepdog (17/19, 89%), Shetland Sheepdog (20/24, 83%), Weimaraner (69/79,
160 87%) were most likely to be exercised for over an hour; in contrast, Bichon Frise (50/147, 34%),
161 Greyhound (118/228, 52%), Lhasa Apso (62/127, 49%), Pomeranian (16/33, 48%), and Yorkshire
162 Terrier (79/179, 44%) were some of the breeds least likely to be exercised for more than an hour.
163 There was also a difference ($P<0.001$) amongst breed groups for the duration of exercise received;
164 dogs in the Gundog (3355/4325, 78%), Pastoral (1241/1585, 78%), and Working (630/866, 73%)

165 groups were more likely to receive exercise for half an hour or more than dogs of Toy (405/814,
166 50%), Utility (600/810, 59%), Terrier (1768/2793, 63%) and Hound (606/924, 66%) groups.
167 A positive association ($P<0.001$) was also found between size of the dog and the duration of
168 exercise they received. Small dogs (1369, 55%) were less likely to receive exercise for longer than
169 30 minutes compared to medium dogs (3484, 72%) and large dogs (3752, 75%). Almost half (45%)
170 of the dogs exercised for less than 30 minutes were small dogs.

171

172 *Off-lead exercise*

173 Some breeds were more commonly allowed off the lead in public ($P<0.001$; Table 1), including:
174 Chow Chow (8, 73% let off the lead); Siberian Husky (67, 61); Pyrenean Mountain Dog (3, 60%);
175 Alaskan Malamute (31, 60%); St Bernard (5, 56%). Differences were also noted in frequency with
176 which dogs in different breed groups were let off the lead in public ($P<0.001$): Working (555, 64%)
177 and Toy (520, 64%) were least likely to be let off the lead; Pastoral (1250, 79%) and Gundogs
178 (3707, 86%) were most likely to be let off the lead; and Hound (608; 66%), Utility (676, 67%) and
179 Terrier (1898; 68%) dogs were intermediate.

180

181 *Exercising in relation UK Kennel Club guidelines*

182 There was a significant difference ($P<0.001$) between size of the dog and their Kennel Club
183 exercise recommendations. Small dogs were recommended up to 1 hour per day (1732, 70.0%) or
184 up to 30 minutes per day (744, 30.0%); medium dogs were recommended more than 2 hours per
185 day (1767, 36.6%) or up to 1 hour per day (3065, 63.4%); large dogs were recommended more than
186 2 hours per day (4364, 87.2%) or up to 1 hour per day (642, 12.8%). Thus there appears to be a
187 positive association between size of the dog and exercise recommendations i.e. the bigger the dog,
188 the more exercise it is perceived to require. Based upon the information recorded, 9025 dogs in the
189 survey (53%) did not meet the UK Kennel Club Guidelines for exercise for the respective breed,
190 and differences amongst breeds were seen (Table 1; $P<0.0001$). The breeds most likely to meet the
191 Kennel Club guidelines included: Bearded Collie (54/58, 93%), Chinese Crested dog (15/17, 88%);
192 Irish Terrier (21/24, 88%), Shetland Sheepdog (21/24, 88%) and Cocker Spaniel (704/833, 84%).
193 The breeds least likely to meet the Kennel Club guidelines included: Bloodhound (0/5, 0%), Giant
194 Schnauzer (0/7, 0%); Foxhound (0/3, 0%), Great Dane (1/35, 3%), and Bullmastiff (2/56, 4%).
195 Even in popular breeds like the Labrador Retriever only 8% were reported to meet the guidelines
196 for activity.

197

198 When classed into KC breed groupings, Terriers were most likely to meet KC exercise
199 recommendations (1987/2793, 71%), whilst Working (164/863, 19%) and Pastoral dogs were least

200 likely (327/1585, 21%) ($P < 0.001$) to meet exercise requirements. Finally, there was a difference in
201 the proportion of dogs of different sizes that met UK Kennel Club requirements ($P < 0.0001$): small
202 dogs (1762/2476, 71%) were more likely to receive their daily exercise requirement than either
203 medium (2493/4832, 52%) or large dogs (919/5006, 18%).

204

205 **Discussion**

206

207 This is the first study to investigate differences in reported exercise between dogs of different
208 breeds. We found differences between (and within breeds) relating to factors including: exercise
209 frequency, exercise length, and whether or not the dog met the UK Kennel Club guidelines.⁽⁴⁾

210 Whilst these findings indicate current exercise patterns, further work is now required to determine
211 their significance, for instance, whether different exercise patterns can predispose to or protect from
212 diseases such as obesity. It is suggested that an inverse correlation **exists** between physical activity
213 of dogs and canine obesity.⁽⁹⁾ By encouraging dog owners to meet their own recommended daily
214 exercise, it is hoped that the health and wellbeing of pet dogs will be improved.⁽⁵⁾ Further studies
215 should also be considered not just to examine frequency and duration of exercise but also the nature
216 of the activity undertaken. In one recent study, the majority of time during a dog walk was spent
217 sniffing, suggesting minimal activity overall.⁽¹⁰⁾ Therefore, future studies should also measure
218 intensity of exercise and perhaps distance travelled, using objective methods such as
219 accelerometry⁽¹¹⁾ and global positioning system receivers.⁽¹²⁾

220

221 Differences were seen amongst different breeds in terms of the frequency of exercise. Most notably
222 breeds in the Gundog, Pastoral and Hound groups were more frequently exercised than other dogs,
223 most notably the Toy and Terrier groups. Similarly, duration of exercise varied amongst breed
224 groups and, once again, those in the Gundog, Pastoral and Hound groups were exercised for
225 longest, whilst those in the Terrier and Toy breed groups were exercised least frequently. Similarly,
226 when categorised on size, smaller dogs were exercised for a shorter time overall and less frequently
227 than medium or larger breed dogs, although some notable exceptions occurred (e.g. both Afghan
228 and Foxhounds were amongst the least and most frequently exercised) that require further
229 investigation. These findings support the findings of a recent review of the correlates of dog
230 walking, which also found evidence for smaller dogs being walked less than bigger dogs.⁽⁵⁾ Such
231 differences in exercise pattern might reflect differences in capabilities for exercising amongst
232 breeds, but might also be related to owner factors and geographical location. For example, many
233 owners choose breeds based upon their lifestyle, and owners might select smaller breeds if they are
234 concerned they will not have enough time to exercise a more athletic breed. Geographical location
235 might dictate choice of breed, with more athletic breeds being more commonly chosen when living
236 in rural locations. Unfortunately, given that data were fully anonymised, it was not possible to
237 assess owner or geographical effects, and further studies, likely including in-depth qualitative
238 investigation, are required.

239

240 Although no evidence-based guidelines exist regarding the exercise that dogs in each breed require
241 each day, general recommendations are provided by many canine organisations, such as the UK
242 Kennel Club.⁽⁴⁾ For example, the UK Kennel Club provides guidance by breed regarding the
243 recommended daily exercise, with recommendations varying amongst breeds between >30
244 minutes/day to >2h/day. In this respect, the recommended exercise for many of the smaller breed
245 dogs (e.g. Chihuahua, Lhasa Apso, Papillon, Pomeranian, and Yorkshire Terrier) is >30min/day,
246 although >1h/day is recommended for some small breed dogs (e.g. Border Terrier, Lhasa Apso and
247 Pug). The typical recommendation for many of the medium breeds (e.g. Cavalier King Charles
248 Spaniel, Cocker Spaniel, Miniature Schnauzer, Staffordshire Bull Terrier) is >1h/day, whilst the
249 typical recommendation for larger breeds (e.g. Bullmastiff, Doberman, English setter, Great Dane,
250 Labrador Retriever, Rottweiler, Saluki, and Samoyed) is >2h/day, although >1h/day is
251 recommended for some larger breeds (e.g. Greyhound), whilst >2h/day is recommended for some
252 of the more active medium size breeds (e.g. Border Collie and English Springer Spaniel). Perhaps
253 the most concerning observation of the current study was the fact that only half of the dogs studied
254 received the recommended amount of exercise. In contrast with the frequency and duration of
255 exercise reported, it was more often dogs in many of the larger breeds that did not meet the
256 recommendations. This suggests that it is particularly challenging for owners to ensure that their
257 dog receives >2h/day of exercise. In light of this, evidence-based recommendations are urgently
258 needed to determine whether the 2-hour recommendation is necessary; if it is, better education of
259 prospective dog owners is required to ensure that they understand activity requirements of different
260 breeds, and the particular challenges faced with the larger breeds.

261
262 A number of limitations, in addition to those discussed above should be considered when
263 interpreting the results. First, whilst the use of a voluntary online survey increased the number of
264 responses, it was a convenience sample and, therefore, there are concerns regarding selection bias.
265 In this respect, we cannot be certain that the participants were truly representative of the UK dog
266 population as a whole; it might be that owners who exercise their dog more were more willing to
267 participate than those who did not. The use of self-reports of exercise is subjective, and can be
268 unreliable.⁽¹⁰⁾ Third, in responding, owners could only select from a small number of categories,
269 and owners might have had trouble choosing between categories, not least if they exercised their
270 dogs irregularly in terms of frequency and duration. The use of categories also meant that it was
271 not possible to investigate observations more fully. Therefore, these observations should be
272 considered to be preliminary and further studies are recommended to explore the issue of activity
273 amongst breeds in more detail.

274

275

276 **Conclusions**

277 Exercise patterns of dogs in the UK vary. The finding that half of dogs in the study were not
278 receiving the recommended activity level is concerning. Further work is required to achieve a
279 better understanding of what physical exercise is actually required within breed, and how this
280 relates to health and owner perception.

281

282

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291

292 **Conflict of Interest**

293 Royal Canin financially supports the post of AJG at the University of Liverpool, whilst Dogs Trust
294 Financially supports the post of EB at the University of Bristol.

295

296 **Authorship**

297 AJG, EB, and ME proposed the research questions and designed the questionnaire. EP and CW
298 conceived and performed the study and conducted all statistical analyses. EP, AJG, EB, and CW
299 interpreted the results. EP produced the first draft of the manuscript, which was subsequently
300 edited by AJG, before being reviewed and edited by the other authors. All authors approved the
301 final manuscript.

302

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334 **Table 1.** Exercise frequency, exercise length, daily exercise, off the lead exercise and whether Kennel Club guidelines were met in each breed of dog.

Breed	n (%)	Exercise frequency					Exercise length				Off lead in public	¹ Met KC guideline
		Never	1- 3/week	4-6/week	1/day	>1/day	0-10 minutes	11-30 minutes	30-60 minutes	>1 hour		
Afghan Hound	10 (0.1)	2 (20)	1 (10)	2 (20)	1 (10)	4 (40)	2 (20)	2 (20)	3 (30)	3 (30)	6 (60)	2 (20)
Airedale Terrier	23 (0.1)	0 (0)	2 (9)	2 (9)	6 (26)	13 (56)	0 (0)	6 (26)	10 (44)	7 (30)	21 (91)	18 (78)
Akita	55 (0.3)	1 (2)	6 (11)	3 (6)	12 (22)	33 (60)	0 (0)	6 (11)	39 (71)	10 (18)	23 (42)	4 (7)
Alaskan Malamute	52 (0.3)	0 (0)	5 (10)	4 (8)	15 (29)	28 (54)	0 (0)	10 (19)	22 (42)	20 (38)	21 (40)	11 (21)
Basset Hound	70 (0.4)	1 (1)	12 (17)	3 (4)	23 (33)	31 (44)	5 (7)	27 (39)	22 (31)	16 (23)	47 (67)	44 (63)
Beagle	225 (1.3)	1 (0)	11 (5)	19 (8)	77 (34)	117 (52)	2 (1)	42 (19)	133 (59)	48 (21)	152 (68)	21 (9)
Bearded Collie	58 (0.3)	0 (0)	2 (3)	0 (0)	19 (33)	37 (64)	1 (2)	12 (21)	30 (52)	15 (23)	48 (83)	54 (93)
Bedlington Terrier	23 (0.1)	0 (0)	3 (13)	1 (4)	5 (22)	14 (61)	1 (4)	6 (26)	10 (44)	6 (26)	18 (78)	18 (78)
Bernese Mountain Dog	25 (0.1)	0 (0)	0 (0)	2 (8)	9 (36)	14 (56)	0 (0)	10 (40)	13 (52)	2 (8)	18 (72)	20 (80)
Bichon Frise	147 (0.9)	2 (1)	17 (12)	13 (9)	50 (34)	65 (44)	10 (7)	77 (52)	47 (32)	13 (9)	75 (51)	115 (78)
Bloodhound	5 (0.0)	0 (0)	0 (0)	2 (40)	1 (20)	2 (40)	1 (20)	2 (40)	1 (20)	1 (20)	3 (60)	0 (0)
Border Collie	840 (4.9)	12 (1)	39 (5)	42 (5)	228 (27)	519 (62)	10 (1)	159 (19)	471 (56)	200 (24)	699 (83)	118 (14)
Border Terrier	318 (1.9)	5 (2)	19 (6)	17 (5)	105 (33)	172 (54)	5 (2)	79 (25)	171 (54)	63 (20)	228 (72)	255 (80)
Boston Terrier	23 (0.1)	1 (4)	1 (4)	0 (0)	8 (35)	13 (57)	1 (4)	10 (44)	10 (44)	2 (9)	19 (83)	17 (74)
Boxer	218 (1.3)	0 (0)	9 (4)	17 (8)	71 (37)	121 (56)	2 (1)	57 (26)	119 (55)	40 (18)	162 (74)	18 (8)
Bull Terrier	80 (0.5)	0 (0)	9 (11)	10 (13)	30 (38)	31 (39)	0 (0)	26 (32)	39 (49)	15 (19)	44 (55)	52 (65)
Bulldog	91 (0.5)	4 (4)	9 (10)	8 (9)	43 (47)	27 (28)	6 (7)	37 (41)	40 (44)	8 (9)	64 (70)	49 (54)
Bullmastiff	56 (0.3)	1 (2)	8 (14)	7 (12)	15 (27)	25 (45)	0 (0)	18 (32)	32 (57)	6 (11)	32 (57)	2 (4)
Cairn Terrier	87 (0.5)	0 (0)	8 (9)	6 (7)	17 (20)	56 (64)	1 (1)	33 (38)	47 (54)	6 (7)	59 (68)	67 (77)
Cavalier King Charles Spaniel	334 (2.0)	6 (2)	36 (11)	31 (9)	107 (32)	154 (46)	14 (4)	137 (41)	155 (46)	28 (8)	249 (75)	213 (64)
Chihuahua	162 (1.0)	6 (4)	36 (22)	19 (12)	57 (35)	44 (27)	12 (7)	74 (46)	60 (37)	16 (10)	86 (53)	101 (62)
Chinese Crested	17 (0.1)	0 (0)	0 (0)	2 (12)	6 (35)	9 (53)	1 (6)	5 (29)	10 (59)	1 (60)	12 (71)	15 (82)
Chow Chow	11 (0.1)	0 (0)	1 (9)	1 (9)	3 (27)	6 (54)	0 (0)	7 (64)	4 (36)	0 (0)	3 (27)	7 (64)
Cocker Spaniel	833 (4.9)	2 (0)	42 (5)	42 (5)	244 (29)	503 (60)	6 (1)	193 (23)	494 (59)	140 (17)	683 (82)	704 (84)
Collie (Rough/smooth)	82 (0.5)	2 (2)	4 (5)	4 (5)	24 (29)	48 (58)	1 (1)	19 (23)	46 (56)	16 (20)	68 (83)	67 (82)
Dachshund	137 (0.8)	3 (2)	20 (15)	14 (10)	56 (41)	44 (32)	9 (7)	57 (42)	63 (46)	8 (6)	90 (66)	100 (73)
Dalmatian	99 (0.6)	0 (0)	6 (6)	5 (5)	38 (38)	50 (50)	1 (1)	10 (10)	53 (54)	35 (35)	77 (78)	13 (13)

Dobermann	79 (0.5)	0 (0)	9 (11)	2 (2)	30 (38)	38 (48)	0 (0)	12 (15)	46 (58)	21 (27)	57 (72)	8 (10)
Dogue de Bordeaux	28 (0.2)	0 (0)	3 (11)	1 (4)	10 (36)	14 (50)	0 (0)	10 (36)	15 (54)	3 (11)	18 (64)	20 (71)
English Setter	20 (0.1)	0 (0)	0 (0)	0 (0)	8 (40)	12 (60)	0 (0)	3 (15)	9 (45)	8 (40)	16 (80)	2 (10)
English Springer Spaniel	702 (4.1)	5 (1)	43 (6)	38 (5)	168 (24)	448 (64)	11 (2)	136 (19)	414 (59)	141 (20)	605 (86)	75 (11)
Flat Coated Retriever	68 (0.4)	0 (0)	0 (0)	3 (4)	28 (41)	37 (54)	1 (2)	9 (13)	43 (6)	15 (22)	59 (87)	8 (12)
Fox Terrier	46 (0.3)	1 (2)	3 (6)	0 (0)	19 (41)	23 (50)	1 (2)	19 (41)	17 (37)	9 (20)	33 (72)	34 (74)
Foxhound	3 (0.0)	0 (0)	0 (0)	0 (0)	1 (33)	2 (67)	0 (0)	0 (0)	2 (67)	1 (33)	2 (67)	0 (0)
French Bulldog	79 (0.5)	0 (0)	5 (6)	10 (13)	34 (43)	30 (38)	0 (0)	37 (47)	38 (48)	4 (5)	59 (75)	52 (66)
German Pointer	107 (0.6)	0 (0)	7 (7)	1 (1)	23 (22)	76 (71)	0 (0)	6 (5)	59 (55)	42 (39)	94 (88)	28 (26)
German Shepherd Dog	511 (3.0)	5 (1)	54 (11)	30 (6)	155 (30)	267 (52)	7 (1)	115 (22)	273 (53)	116 (23)	364 (71)	56 (11)
Giant Schnauzer	7 (0.0)	0 (0)	1 (14)	0 (0)	2 (29)	4 (57)	0 (0)	0 (0)	5 (71)	2 (27)	6 (86)	0 (0)
Golden Retriever	400 (2.3)	1 (0)	21 (5)	18 (4)	128 (32)	232 (58)	3 (1)	80 (20)	238 (60)	79 (19.8)	342 (86)	46 (12)
Great Dane	35 (0.2)	1 (3)	4 (11)	7 (20)	10 (29)	13 (37)	3 (9)	10 (29)	19 (54)	3 (9)	27 (77)	1 (3)
Greyhound	228 (1.3)	1 (0)	11 (5)	5 (2)	54 (24)	157 (69)	4 (2)	106 (46)	98 (43)	20 (9)	129 (57)	187 (82)
Hungarian Vizsla	89 (0.5)	0 (0)	1 (1)	1 (1)	17 (19)	70 (79)	0 (0)	5 (6)	58 (65)	26 (29)	78 (88)	15 (17)
Irish Setter	52 (0.3)	0 (0)	0 (0)	0 (0)	20 (39)	32 (62)	0 (0)	8 (15)	33 (64)	11 (21)	38 (73)	4 (8)
Irish Terrier	24 (0.1)	0 (0)	0 (0)	1 (4)	8 (33)	15 (62)	0 (0)	7 (29)	12 (50)	5 (21)	20 (83)	21 (88)
Jack Russell Terrier	929 (5.5)	17 (2)	91 (10)	72 (8)	276 (30)	473 (51)	30 (3)	324 (35)	465 (50)	110 (12)	628 (68)	656 (71)
Labrador Retriever	1975 (11.6)	13 (1)	93 (5)	114 (6)	552 (28)	1203 (61)	29 (2)	470 (24)	1158 (57)	318 (16)	1722 (87)	154 (8)
Lhasa Apso	127 (0.7)	0 (0)	15 (12)	10 (8)	37 (29)	65 (51)	7 (6)	58 (46)	57 (45)	5 (4)	71 (56)	102 (80)
Mastiff	38 (0.2)	0 (0)	2 (5)	5 (13)	14 (37)	17 (45)	1 (3)	13 (34)	18 (47)	6 (16)	28 (74)	28 (74)
Miniature Schnauzer	199 (1.2)	1 (0)	7 (4)	9 (4)	52 (26)	130 (65)	2 (1)	77 (39)	99 (50)	21 (11)	151 (76)	163 (82)
Newfoundland	37 (0.2)	2 (5)	1 (3)	3 (8)	15 (40)	16 (43)	2 (5)	14 (38)	21 (57)	0 (0)	22 (60)	24 (65)
Old English Sheepdog	19 (0.1)	0 (0)	0 (0)	0 (0)	5 (26)	14 (74)	0 (0)	2 (10)	11 (58)	6 (32)	18 (95)	5 (26)
Papillon	19 (0.1)	0 (0)	7 (37)	1 (5)	4 (21)	7 (37)	0 (0)	9 (47)	9 (48)	1 (5)	12 (63)	11 (58)

Pekingese	3 (0.0)	0 (0)	1 (33)	0 (0)	2 (67)	0 (0)	(0 (0)	2 (67)	1 (33)	0 (0)	2 (67)	2 (67)
Pomeranian	33 (0.2)	1 (3)	7 (21)	1 (3)	15 (46)	9 (27)	5 (15)	12 (36)	14 (42)	2 (6)	16 (48)	24 (73)
Poodle	110 (0.6)	0 (0)	10 (9)	6 (6)	36 (33)	58 (53)	7 (6)	35 (32)	54 (49)	14 (13)	82 (74)	78 (71)
Pug	99 (0.6)	1 (1)	14 (14)	10 (10)	28 (28)	46 (46)	2 (2)	49 (50)	39 (39)	9 (9)	68 (69)	74 (75)
Pyrenean Mountain Dog	5 (0.0)	1 (20)	0 (0)	1 (20)	3 (60)	0 (0)	0 (0)	1 (20)	1 (20)	3 (60)	2 (40)	3 (60)
Rhodesian Ridgeback	67 (0.4)	1 (2)	2 (3)	4 (6)	20 (30)	40 (60)	2 (3)	11 (16)	38 (57)	16 (23.9)	54 (81)	10 (15)
Rottweiler	169 (1.0)	2 (1)	17 (10)	15 (9)	57 (34)	78 (46)	2 (1)	49 (29)	86 (51)	32 (19)	117 (69)	12 (7)
Saluki	33 (0.2)	0 (0)	0 (0)	2 (6)	13 (39)	18 (54)	0 (0)	12 (36)	15 (46)	6 (18)	19 (58)	3 (9)
Samoyed	46 (0.3)	0 (0)	3 (6)	3 (6)	17 (37)	23 (50)	0 (0)	13 (28)	23 (50)	10 (22)	32 (70)	3 (6)
Shar Pei	44 (0.3)	0 (0)	8 (18)	1 (2)	15 (34)	20 (46)	2 (4)	17 (39)	18 (41)	7 (16)	21 (48)	30 (68)
Shetland Sheepdog	24 (0.1)	0 (0)	0 (0)	3 (12)	9 (38)	12 (50)	0 (0)	4 (17)	15 (62)	5 (21)	19 (79)	21 (88)
Shih Tzu	195 (1.1)	4 (2)	31 (16)	23 (12)	44 (23)	93 (48)	10 (5)	91 (47)	78 (40)	16 (8)	125 (64)	115 (59)
Siberian Husky	110 (0.6)	1 (1)	11 (0)	9 (8)	39 (36)	50 (46)	0 (0)	19 (17)	59 (54)	32 (29)	43 (39)	13 (12)
St. Bernard	9 (0.1)	0 (0)	2 (22)	0 (0)	3 (33)	4 (44)	0 (0)	1 (11)	7 (78)	1 (11)	4 (44)	7 (78)
Staffordshire Bull Terrier	743 (4.4)	9 (1)	88 (12)	62 (8)	236 (32)	348 (47)	17 (2)	238 (32)	387 (52)	101 (14)	502 (68)	513 (69)
Weimaraner	79 (0.5)	4 (5)	5 (6)	2 (2)	24 (30)	44 (56)	0 (0)	10 (13)	46 (58)	23 (29)	70 (89)	11 (14)
West Highland White Terrier	318 (1.9)	2 (1)	24 (8)	27 (8)	106 (33)	159 (50)	5 (2)	116 (36)	166 (52)	31 (10)	223 (70)	237 (74)
Whippet	146 (1)	1 (1)	6 (4)	14 (10)	49 (34)	76 (52)	3 (2)	31 (21)	86 (59)	26 (18)	106 (73)	113 (77)
Yorkshire Terrier	179 (1)	3 (2)	29 (16)	23 (13)	55 (61)	69 (38)	8 (4)	92 (51)	74 (43)	5 (3)	103 (58)	99 (55)

335 ¹ Dogs meeting Kennel Club guidelines. All data expressed as number (percentage).

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337 **Table 2.** Exercise frequency based on age, sex, neuter status, UK Kennel Club grouping, and size.

Variable		Exercise <1/day	Exercise ≥1day	P value ¹
Age (years)				<0.0001
	1-3	647 (12)	4594 (88)	
	3-10	1504 (16)	8086 (84)	
	>10	395 (18)	1784 (82)	
Sex				0.565
	Male	1408 (15)	8072 (85)	
	Female	1145 (15)	6403 (85)	
Neuter status				<0.0001
	Entire	733 (18)	3288 (82)	
	Neutered	1820 (14)	11187 (86)	
KC Groupings				<0.0001
	Gundog	456 (10)	3869 (90)	
	Pastoral	205 (13)	1380 (87)	
	Hound	138 (15)	786 (85)	
	Working	151 (18)	712 (82)	
	Utility	184 (18)	826 (82)	
	Terrier	536 (19)	2257 (81)	
	Toy	211 (26)	603 (74)	
Size of dog				<0.0001
	Small	528 (21)	1948 (79)	
	Medium	727 (15)	4105 (85)	
	Large	626 (12)	4380 (88)	

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340 ¹ Comparisons made with the Chi square test. ² KC Grouping: Breed group based upon UK Kennel

341 Club classification. ³ Size based upon UK Kennel Club Classification