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1 **A retrospective study of more than 9,000 feline cutaneous tumours in the United**
2 **Kingdom: 2006 - 2013**

3

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15

16 **Key words**

17 Feline, neoplasia, skin, cutaneous, tumour

18

19 **Abstract**

20 *Objectives*

21 To utilise a large database available from a UK-based, commercial veterinary diagnostic
22 laboratory to ascertain the prevalence of different forms of cutaneous neoplasia within the
23 feline population, and to detect any breed, sex, or age predilections for the more common
24 tumours.

25

26 *Methods*

27 Records from the laboratory were searched for feline submissions received between the dates
28 31st May 2006 and 31st October 2013. For masses arising within the skin for which
29 histopathology had been performed, the diagnosis was recorded together with the breed, age,
30 sex and neuter status of the cat. Odds ratios for breed predisposition to skin tumours overall, to
31 histologically malignant tumours and to the more commonly occurring tumours were
32 calculated, with the non-pedigree cat population as the control.

33

34 *Results*

35 Of the 219,083 feline samples submitted, masses arising within the skin comprised 4.4% and
36 there were 89 different diagnoses recorded for these masses. Just 6.6% of these cases were non-
37 neoplastic in nature, and of neoplastic masses, 52.7% were considered histologically malignant.
38 The ten most common skin tumour types accounted for 80.7% of cases, with the four most
39 common being basal cell tumours, fibrosarcomas, squamous cell carcinoma and mast cell
40 tumours.

41

42 *Conclusions and relevance*

43 Despite the large number of different diagnoses in this study, a relatively small number of
44 tumour types accounts for the majority of skin masses in occurring cats, most of which are
45 neoplastic in nature. There are a number of breed predispositions for the more common tumour
46 types, although no pedigree breed had increased odds of developing a malignant tumour
47 compared to the non-pedigree cat population; several breeds had significantly decreased odds.
48 Just over half of the neoplastic masses in this study were considered histologically malignant.

49

50

51 **Introduction**

52 The skin and subcutis are the most common anatomic locations for tumours to arise in the cat.¹

53 As both the largest and the most exposed organ of the body, the skin is particularly susceptible

54 to external insults in a variety of forms, and it is also the most easily visualised and palpable.

55 Whilst there have been several major studies regarding the prevalence of feline tumours in

56 other countries, including both the USA and Switzerland,^{2,3} there is little current information

57 available as to the prevalence of cutaneous tumours specific to the UK cat population.

58

59 There is some variation between these studies, but the general consensus is that the four most

60 common skin tumour types are fibrosarcoma, squamous cell carcinoma, mast cell tumour and

61 the tumours which fall under the umbrella term of 'basal cell tumour',^{2,3,4,5} with some

62 differences in the order of prevalence depending on the particular study.

63

64 The purpose of this study was to utilise a large data set from a commercial veterinary diagnostic

65 laboratory to determine the prevalence of different forms of cutaneous tumours in the UK cat

66 population, during the period from 31st May 2006 to the 31st October 2013, and to detect any

67 breed, sex, or age predilections for the more common tumours.

68

69 **Material and Methods**

70 Records from a large, UK-based commercial diagnostic laboratory (Finn Pathologists, Diss,

71 UK) were searched for feline submissions received between the dates 31st May 2006 and 31st

72 October 2013, including samples submitted for various blood tests, cytology and

73 histopathology. Histopathology samples taken from masses arising within the skin were then

74 searched for according to the diagnosis made by the histopathologist originally reporting the

75 case. Masses submitted from cats based outside of the UK, or any tumour not located within

76 the epidermis, dermis, subcutis or skin appendages were excluded. Tumours arising from the
77 mammary glands, oral cavity and third eyelid were also excluded, while tumours arising from
78 the ears and anal gland region were included for the purposes of this study. Cats with multiple
79 samples taken from the same tumour were recorded only once. For all cases included in this
80 study the breed, age and sex and neuter status of the cat were recorded, where this data was
81 available from the original submission form, as well as the histopathological diagnosis of the
82 mass.

83

84 A total of 35 different feline breeds were recorded. Domestic shorthair (DSH), Domestic
85 longhair (DLH), Domestic cat and 'crossbreed' cats were amalgamated under the term 'non-
86 pedigree', and cats of unspecified breed were recorded as 'unknown'. Cats classified as non-
87 pedigree were used as the standard for comparison both for determining whether pedigree
88 breeds had a statistically significant different odds ratio with regard to developing skin tumours
89 and the odds of having a malignant tumour. Gender was recorded as one of the following: male,
90 male neutered, female, female neutered, unknown.

91

92 Cutaneous masses were classified into either neoplastic or non-neoplastic (including cysts,
93 hamartomas, inflammatory, hyperplastic or pigmentary growths forming a mass-type lesion).
94 Masses were then further categorised into one of four groups based upon their embryological
95 origin; epithelial, mesenchymal, melanocytic or haematopoietic. Any remaining neoplasms
96 which were either metastatic tumours or did not fit these categories and any skin tumours of
97 indeterminable origin were classified as metastatic/other. The term 'basal cell tumour' was
98 used to encompass all forms of benign basal cell tumour, including trichoblastomas and
99 apocrine ductal adenomas.

100

101 Statistical analysis was performed using Prism 7 for Mac OS X (Version 7.0a). Data were
102 systematically tested for normality and tested accordingly with D'Agostino and Pearson
103 normality or Kruskal-Wallis tests as appropriate. Odds ratios for breed predisposition to skin
104 tumours, malignant tumours and certain types of tumours were calculated using an odds ratio
105 calculator (MedCalc®, Version 16.8.4) at a 95% confidence interval with non-pedigree (OR =
106 1) as the control against which all other breeds were assessed. A p value less than 0.05 was
107 considered to be significant.

108

109 **Results**

110 The total number of feline submissions to the laboratory over the time period 31st May 2006 to
111 31st October 2013 was 219,083, including blood samples, cytology and histopathology
112 submissions. Of these, masses arising within the skin comprised 4.4% (9,683) affecting a total
113 of 9,200 individual cats, and for which there were 89 different diagnoses recorded. Of these
114 skin masses, 6.6% (636 of the 9,683) were non-neoplastic in nature; the three most common
115 diagnoses were follicular cysts (307 cases), apocrine gland cysts (178 cases) and dermoid cysts
116 (44 cases), accounting for 83% of all the non-neoplastic masses in this study.

117

118 The remaining masses were deemed neoplastic in nature (9,047 of the 9,683; 93.4%), with
119 47.6% of these categorised as benign and 52.7% as malignant based on the original
120 histopathology report (the remaining five masses could not be clearly categorised as either
121 benign or malignant).

122

123 For the benign cutaneous neoplasms, those of epithelial origin were the most frequent subtype,
124 accounting for 66% of all benign tumours in this study (2,823 out of 4,275 masses), followed
125 by tumours of mesenchymal origin (17.5%; 748 out of 4,275 masses), tumours of

126 haematopoietic origin (15.0%; 642 out of 4,275) and tumours of melanocytic origin (1.5%; 62
127 out of 4,275). For malignant neoplasms, tumours of mesenchymal origin were most common
128 subtype comprising 49% of all malignant cutaneous masses (2,342 out of 4,767 masses),
129 followed closely by those of epithelial origin (39.4%, 1,877 out of 4,767). Metastatic and other
130 tumours accounted for 8% (381 of 4,767) and the remainder were of melanocytic (2.2%, 107
131 from 4,767) or haematopoietic origin (1.3%, 60 out of 4,767; table 1).

132

133 ***Breed***

134 Cats classified as non-pedigree (including DSH, DLH, “domestic cat” and “crossbreed”)
135 accounted for 88.2% of all feline sample submissions to the laboratory, while cats with no
136 breed recorded (“unclassified”) accounted for 3%, and the remainder of the cat population (9%)
137 comprised various pedigree breeds.

138

139 When considering all cutaneous neoplasms, both benign and malignant, certain breeds had
140 statistically significant increased odds of developing a skin tumour when compared to the non-
141 pedigree cat population (figure 1). These included the British Blue ($p = 0.05$, OR = 1.33, [CI =
142 1.00; 1.78]) and the Himalayan breeds ($p = 0.0005$, OR = 12.65, [CI 3.02; 52.92]). Several
143 other breeds had statistically significant decreased odds of developing a skin tumour when
144 compared to the non-pedigree cat population, including the Siamese ($p < 0.0001$, OR = 0.63,
145 [0.52; 0.76]), Burmese ($p = 0.0045$, OR = 0.72, [CI 0.58; 0.90]), Birman ($p = 0.0002$, OR = 0.35,
146 [0.20; 0.61]) and Oriental breeds ($p = 0.023$, OR = 0.44, [CI 0.22; 0.89]).

147

148 When only malignant neoplasms are considered, no pedigree breeds had statistically significant
149 increased odds of developing a malignant tumour when compared to the non-pedigree cat
150 population, but several breeds had statistically significant decreased odds (figure 2); these

151 included the Persian ($p < 0.0001$, OR = 0.29, [CI 0.20; 0.41]), Siamese ($p < 0.0001$, OR = 0.22,
152 [CI 0.14; 0.36]), Burmese ($p < 0.0001$, OR = 0.18, [CI 0.10; 0.33]), Ragdoll ($p = 0.0004$, OR =
153 0.28, [CI 0.14; 0.57]), British Blue ($p = 0.0004$, OR = 0.31, [CI 0.16; 0.59]), Birman ($p = 0.056$,
154 OR = 0.28, [CI 0.078; 1.034]) and Norwegian Forest cat breeds ($p = 0.012$, OR = 0.20, [CI
155 0.058; 0.71]).

156

157 *Age and gender*

158 Ages of affected cats ranged from under one year up to 25 years, with a median age of 11 years
159 at the time of diagnosis. Seven cutaneous masses were from cats less than one year of age; two
160 of these were MCTs and the remainder were non-neoplastic (two follicular hamartomas, two
161 dermoid cysts and one cutaneous horn of feline paw-pad). There was no significant difference
162 between the ages at which male and female animals were diagnosed with neoplastic skin
163 tumours ($p = 0.013$). Malignant tumours were seen in an older population of animals (median
164 age 12 years) compared with benign tumours (median age 11 years; $p < 0.0001$), and this
165 difference was more pronounced in male cats. Male neutered cats also tended to develop benign
166 tumours at an earlier age than female neutered cats ($p = 0.0128$), but no significant difference
167 in age was seen between the genders when developing malignant tumours, nor with benign
168 tumours arising in male entire and female entire cats.

169

170 *Diagnosis*

171 The ten most common skin tumour types accounted for 80.7% (7,300 out of 9,047 masses) of
172 all the neoplastic skin masses in this study, both benign and malignant. In order of descending
173 prevalence these were: basal cell tumours (2,189; 22.6%), fibrosarcomas (1,766; 19.5%),
174 squamous cell carcinoma (SCC; 1,031; 11.4%), mast cell tumour (MCT; 618; 6.8%), lipoma
175 (516; 5.7%), haemangiosarcoma (404; 4.5%), apocrine cystadenoma (269; 3.0%),

176 undifferentiated carcinomas (255; 2.8%), basal cell carcinoma (252; 2.8%) and ceruminous
177 gland tumours (183; 2.0%) arising within the ear canals (table 2). The gender and age
178 distribution of affected cats with these ten most commonly occurring neoplasms are
179 summarised in table 2 and figure 3.

180

181 ***Basal cell tumours***

182 Basal cell tumours were the most common skin tumour in this study, accounting for 22.6% of
183 all neoplastic skin masses (2,189 cases out of 9,047). Within this category, the majority were
184 sub-classified as apocrine ductular adenomas (648 cases; 29.6% of all basal cell tumours) and
185 the second most common sub-classification was trichoblastoma (610 cases; 27.9% of all basal
186 cell tumours). If these two most common forms of basal cell tumour had been categorised as
187 separate, distinct entities they would have ranked as the third most common skin tumour in the
188 case of apocrine ductular adenomas, and the fifth most common in the case of trichoblastomas,
189 just above and below MCTs respectively. The remainder of basal cell tumours in the database
190 were either not further sub-classified (521 cases; 23.8%), or diagnosed as undifferentiated (315
191 cases; 14.4%), or as differentiating to apocrine glands (48 cases; 2.2%), squamous cells (19
192 cases; 0.9%), sebaceous glands (15 cases; 0.7%) or with multiple differentiation (11 cases;
193 0.5%).

194

195 The Persian ($p = 0.0002$, OR = 1.84, [CI = 1.33; 2.54]), British Blue ($p = 0.041$, OR = 1.85,
196 [CI = 1.03; 3.34]) and Norwegian Forest cat ($p = 0.0011$, OR = 4.98, [CI = 1.89; 13.11]) breeds
197 had statistically significant increased odds of having basal cell tumours compared with the non-
198 pedigree population, while the Siamese breed ($p = 0.030$, OR = 0.55, [CI = 0.32; 0.94]) had
199 significantly decreased odds. The median age of cats developing basal cell tumours was 11

200 years (ranging from one to 21 years) at the time of diagnosis (table 2), and no gender
201 predisposition was detected.

202

203 ***Fibrosarcoma***

204 Fibrosarcoma was the second most commonly diagnosed neoplastic skin tumour (19.5%; 1,766
205 cases out of 9,047). The Chinchilla breed ($p = 0.040$, OR = 4.27, [CI 1.07; 17.08]) had
206 statistically significant increased odds of developing fibrosarcoma compared with the non-
207 pedigree population, although the sample size for this breed was small ($n = 8$). The Persian (p
208 < 0.0001 , OR = 0.24, [CI 0.12; 0.47]), Siamese ($p = 0.0003$, OR = 0.16, [CI 0.059; 0.43]),
209 Burmese ($p = 0.0021$, OR = 0.16, [CI 0.052; 0.52]) and British Blue breeds had statistically
210 significant decreased odds of developing fibrosarcoma compared to the non-pedigree
211 population. The median age of cats diagnosed with fibrosarcoma was also 11 years (ranging
212 from one to 25 years; table 2), and no gender predisposition was found.

213

214 ***Squamous cell carcinoma (SCC)***

215 SCC was the third most commonly diagnosed neoplastic skin tumour in this study (11.4%,
216 1031 cases out of 9,047). Of these cases, 556 (53.9%) affected male cats, whether entire or
217 neutered; male cats were at a 1.54 greater odds of developing SCC than females ($p = 0.0012$).
218 Three breeds had statistically significant decreased odds of developing SCC compared to the
219 non-pedigree cat population, including the Persian ($p = 0.0055$, OR = 0.3409, [CI 0.16; 0.73]),
220 the Siamese ($p = 0.0093$, OR = 0.22, [CI 0.069; 0.69]) and the Burmese ($p = 0.042$, OR = 0.30,
221 [CI 0.095; 0.96]). The median age of cats diagnosed with SCC was 12 years (ranging from one
222 to 21 years; table 2).

223

224 ***Mast cell tumours (MCT)***

225 MCT was the fourth most common neoplastic skin tumour in this study (6.8%, 618 cases out
226 of 9,047), and included both the mastocytic and histocytic forms. Several breeds had
227 statistically significant increased odds of developing MCT compared to the non-pedigree cat
228 population, including the Siamese ($p < 0.0001$, OR = 5.3734, [CI 3.4695; 8.3223]), the
229 Burmese ($p = 0.0013$, OR = 2.7702, [CI 1.491; 5.1466]), the Maine Coon ($p = 0.0495$, OR =
230 1.9425, [CI 1.0015; 3.7677]) and the Ragdoll ($p < 0.0001$, OR = 7.4333, [CI 3.9172; 14.1053]).
231 The Oriental ($p = 0.0412$, OR = 5.3095, [CI 1.069; 26.3717]), the Russian Blue ($p = 0.0077$,
232 OR = 4.551, [CI 1.4947; 13.8752]) and the Havana breeds ($p = 0.0047$, OR = 31.8569, [CI
233 2.8838; 351.9177]) also had statistically significant increased odds of developing MCT
234 compared with the non-pedigree population, although the sample sizes for these breed were
235 very small ($n = 2$, $n = 4$ and $n = 2$ respectively). The median age of cats diagnosed with MCTs
236 was ten years (ranging from under one year to 20 years; table 2).

237

238 **Discussion**

239 Neoplasia, arising at any anatomical location, is the fourth most common cause of death for
240 cats presenting to primary care veterinary practices within England according to a recent
241 study,⁶ accounting for up to one quarter of deaths in the older cat population. Several studies
242 have found that the skin and subcutis are the most common locations for tumours in cats,^{1,2}
243 with the proportion varying from 29.6% to 41.5% of all tumours arising within these tissues.
244 Furthermore, a significant number of these tumours are malignant; the current study found that
245 52.7% of skin tumours in cats were histologically malignant, and another recent Swiss study³
246 found 76.1% were malignant. The difference in the proportion of malignant skin tumours
247 between these two studies may in part be due to the differences in the two study populations;
248 the current study utilises data from a commercial diagnostic laboratory covering the years 2006
249 to 2011 and for who primary care veterinary practices comprise the vast majority of clients,

250 while the former study comprises data from two university-based diagnostic laboratories as
251 well as a private laboratory and gathered over a time span of over 40 years.

252

253 In the current study, the ten most common skin tumours accounted for 80.7% of all cutaneous
254 neoplasms, despite the large number of different diagnoses given for masses arising at this site
255 (89 in total). Both in this study and in three other large studies^{2,3,4} looking at the prevalence of
256 different skin tumours in cats, the four most commonly diagnosed tumours are very consistent,
257 despite the differences in geographical location and time periods covered by the studies. These
258 four skin tumours are basal cell tumours, mast cell tumours, fibrosarcomas and squamous cell
259 carcinomas, although the precise order of prevalence varies depending on the particular study.
260 These four most common diagnoses account for 60.3% all cutaneous tumours in UK cats in the
261 present study, while in an earlier UK-based study⁴ these accounted for 65.3%, in an American-
262 based study² they accounted for 77.1% and in the recent Swiss study³ it was 71.5%.

263

264 When all tumours are considered (both benign and malignant), two breeds have statistically
265 significant increased odds of developing cutaneous neoplasia when compared to the non-
266 pedigree cat population, namely the British Blue and the Himalayan breeds, while four breeds
267 have decreased odds, including the Persian, Burmese, Birman and Oriental breeds. When only
268 malignant tumours are included, no breed has statistically significant increased odds of
269 developing neoplasia compared to the non-pedigree cat population but several have decreased
270 odds, including the Persian, Siamese, Burmese, Ragdoll, British Blue, Birman and Norwegian
271 Forest cat breeds. The recent Swiss study³ found that the European shorthair cat (the most
272 common breed in that study) had the highest odds of developing a tumour in the skin or
273 subcutis, while several other pedigree breeds had significantly lower odds ratios, overall in
274 agreement with the present study. Studies looking for breed predispositions to various tumours

275 in cats are always hampered to some degree by the predominance of non-pedigree cats, with
276 far fewer representatives of some pedigree breeds being present within the feline population as
277 a whole.

278

279 The most commonly diagnosed tumour arising with the skin of cats in this study was basal cell
280 tumour, comprising 22.6% of the total. This was also the most commonly diagnosed tumour in
281 the previous American-based study² (26.1%), whilst basal cell tumours ranked second most
282 common in the Swiss study³ (14.4%) and third in the earlier UK-based study⁴ (14.8%). Another
283 study⁷ looking at 124 feline basal cell tumours found they comprised 10.9% of all feline skin
284 neoplasms. However, basal cell tumours are a rather heterogenous group of neoplasms,
285 encompassing several distinct types of tumour including apocrine ductular adenomas and
286 trichoblastomas (both of which themselves have several different histological sub-types). Both
287 apocrine ductular adenomas and trichoblastomas appear to be common feline skin tumours in
288 their own rights, but inconsistencies in the classification of basal cell tumours makes their true
289 incidence in this and in other studies difficult to determine. Longhaired cats were previously
290 reported to be predisposed to developing basal cell tumours,⁷ while in this study the Persian,
291 British Blue and Norwegian Forest cat breeds were found to have significantly increased odds
292 of developing these tumours and the Siamese breed had decreased odds. No gender
293 predisposition was noted, similar to previous studies.^{2,7}

294

295 Fibrosarcomas were found to be the second most common skin neoplasm in this study (19.5%),
296 and were the most common skin tumour in both previous European studies (25.4%⁴, 38.7%³)
297 but fourth in the American study.² In the present study, this category would undoubtedly
298 include a proportion of feline injection-site sarcomas (FISS) with the histological phenotype
299 of a fibrosarcoma, however the incidence of FISS in the UK and the US is thought to be

300 relatively low.⁸ In this study only one breed – the Chinchilla – was found to have significantly
301 increased odds of developing fibrosarcoma compared to the non-pedigree cat population,
302 although the sample size for this breed is very small. Several breeds, including the Persian,
303 Siamese, Burmese and British Blue breeds had significantly lower odds of developing
304 fibrosarcoma compared to non-pedigree cats.

305

306 Squamous cell carcinoma (SCC) was the third most common neoplastic skin tumour in this
307 study (11.4%), and was also the third most common tumour in the American² (15.2%) and
308 Swiss studies³ (11.7%). SCC ranked second most common in the earlier UK-based study⁴
309 (17.4%); the prevalence of SCC appears relatively consistent despite the different geographical
310 locations of these studies. Both geography and skin pigmentation would be expected to
311 influence the prevalence of SCC in different feline populations due to the relationship between
312 SCC development and exposure to solar radiation. For example, breeds which typically have
313 darker pigmentation of ear pinnae, eyelids and nasal planum (such as the Siamese) have
314 previously been found to be at decreased risk of developing SCC,^{2,3} and the current study also
315 supports this finding. The Burmese and Persian breeds also had a decreased risk of developing
316 SCC compared to the non-pedigree cat population in this study; unfortunately coat colour is
317 rarely recorded in these cases, making it impossible to determine if there is any correlation
318 between the degree of pigmentation and the likelihood of tumour development. Male cats
319 (neutered or entire) were found to have significantly higher odds of developing SCC than
320 females in this study, a finding not previously reported.²

321

322 Mast cell tumours (MCT) were the fourth most common skin tumour in this study, accounting
323 for 6.8% of all feline skin neoplasia, comparable with the two previous European studies;
324 MCTs were also the fourth most common tumour in the earlier UK-based study⁴ (7.7%), and

325 were fifth most common in the Swiss study (6.7%).³ In contrast, MCTs were the second most
326 common skin tumour in the American study,² accounting for 21.1% of all skin neoplasia.
327 Several breeds have previously been reported to be predisposed to developing MCTs, including
328 the Siamese,^{2,9} Burmese, Russian Blue and Ragdoll breeds.⁹ The present study confirms these
329 particular breed predispositions, and in addition the Maine Coon, Oriental and Havana breeds
330 also appear to have an increased risk of developing MCTs. The two neoplastic masses arising
331 in cats less than one year of age were also both MCTs, similar to previous studies describing
332 MCTs arising in very young cats.¹⁰ The MCTs diagnosed in the cats in this study included both
333 the mastocytic and histiocytic forms, as detailed in a previous study.⁹

334

335 **Conclusions**

336 In summary, this large, UK-based retrospective study of feline cutaneous tumours supports the
337 findings of previous studies, both American- and European-based, in that the four most
338 common skin tumours in cats are basal cell tumours, fibrosarcoma, SCC and MCTs, although
339 there are interesting differences in the prevalence of these different tumours between the
340 studies. Despite the large number of different diagnoses in this study, a relatively small number
341 of tumour types accounts for the majority of skin masses in occurring cats. The study also
342 confirms a number of apparent breed predispositions, for example to developing MCTs. When
343 considering all forms of skin neoplasia, just over half of the masses in this study were
344 considered histologically malignant, highlighting the importance of prompt and thorough
345 diagnostic investigation of cutaneous masses in cats.

346

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351

352 **Conflict of interest**

353 The Authors declare that there is no conflict of interest with respect to the research, authorship,
354 and/or publication of this article.

355

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392

393 **Table 1. Cutaneous tumours according to embryonic origin and malignancy**

Origin	Benign (n=4275)	Malignant (n=4767)	Total (n=9042)
Epithelial	2823	1877	4700
Mesenchymal	748	2342	3090
Haematopoietic	642	60	702
Melanocytic	62	107	169
Metastatic/other	n/a	381	381

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410 **Table 2. The ten most common types of skin tumours from a total of 9046 submissions,**
 411 **with the number of affected cats, male:female ratio, median and mean age. st dev =**
 412 **standard deviation**

413

	Neoplasm	Number of cases (%)	Male:female ratio	Median age (range)	Mean age (st dev)
1	Basal cell tumour	2189 (22.6)	0.98	11 (1-21)	11.0 (3.32)
2	Fibrosarcoma	1766 (19.5)	0.96	11 (1-25)	11.0 (3.37)
3	Squamous cell carcinoma	1031 (11.4)	1.24	12 (1-21)	12.2 (3.30)
4	Mast cell tumour	618 (6.8)	1.19	10 (<1-20)	9.9 (4.00)
5	Lipoma	516 (5.7)	1.15	10 (1-18)	9.6 (3.24)
6	Haemangiosarcoma	404 (4.5)	1.17	10.5 (1-20)	10.5 (3.59)
7	Apocrine cystadenoma	269 (3.0)	0.88	12 (2-19)	12.0 (2.93)
8	Carcinoma, undifferentiated	255 (2.8)	0.97	10 (4-20)	12.1 (3.01)
9	Basal cell carcinoma	252 (2.8)	1.17	13 (2-19)	12.5 (3.14)
10	Ceruminous gland tumour	183 (2.0)	1.02	10 (2-18)	10.3 (3.57)

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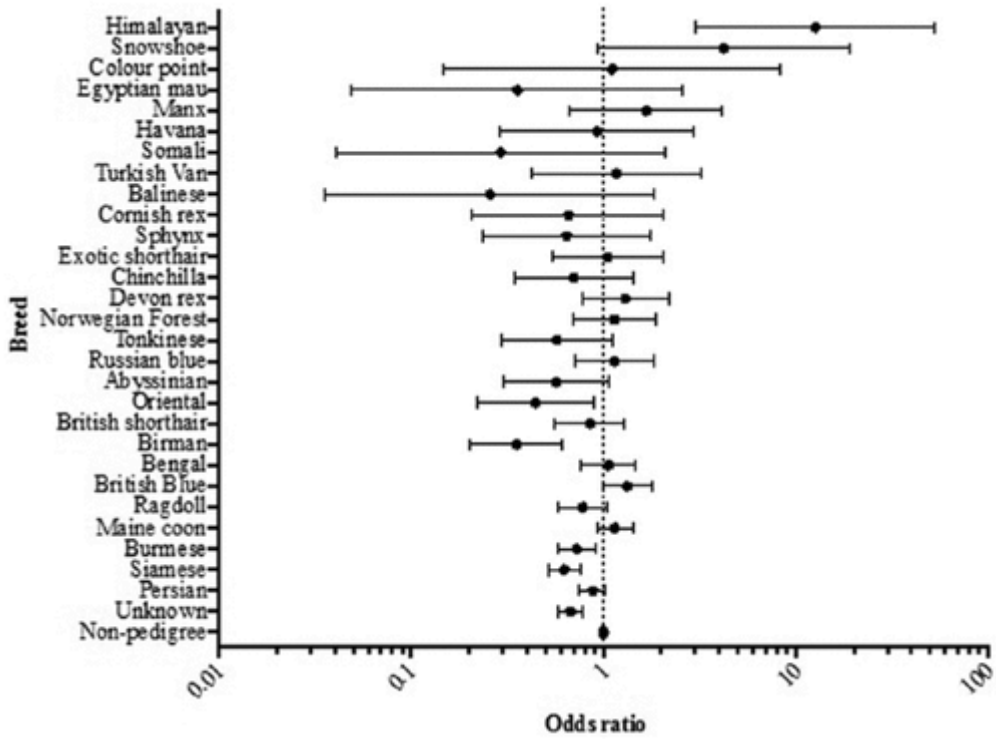
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423 **Figure legends**

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425 **Figure 1. Odds ratios for all cutaneous masses in pedigree breeds compared to the non-**
426 **pedigree population.** OR = odds ratio; 95% confidence interval, non-pedigree population OR
427 = 1; n = 9683



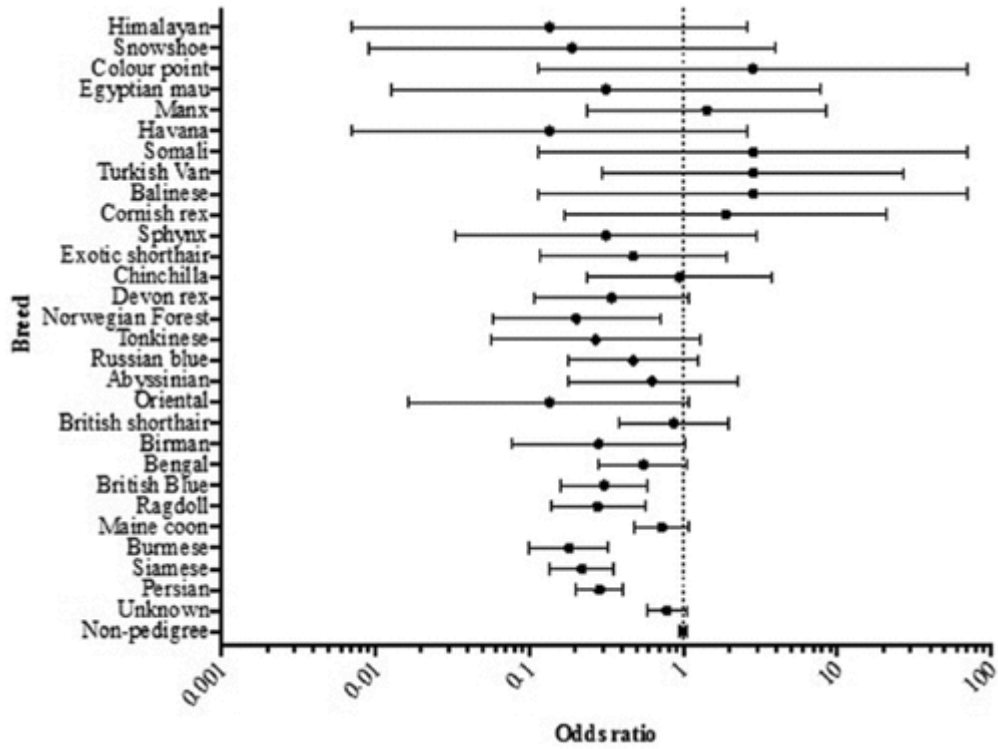
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432 **Figure 2. Odds ratios for malignant cutaneous neoplasms in pedigree breeds compared**
 433 **to the non-pedigree cat population.** OR = odds ratio; 95% confidence interval, non-pedigree
 434 population OR = 1; n = 4767

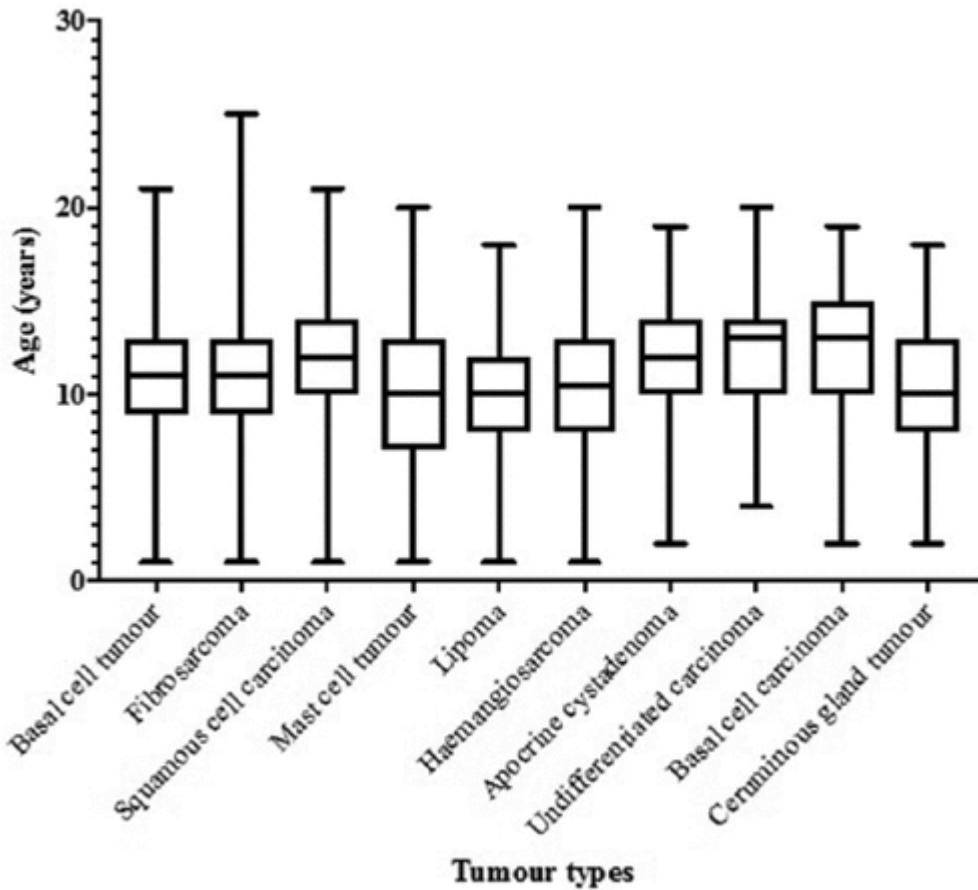


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438 **Figure 3. Age distribution of cats presenting with the ten most common types of skin**
439 **tumour.** Figure demonstrating the age distribution (median, interquartile range, minimum and
440 maximum) of cats presenting with the ten most common types of neoplastic cutaneous tumour,
441 starting with the most common neoplasm on the left side.



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