

Background

Degenerative mitral valve disease (DMVD) is the most common cardiac disease in dogs (1), yet optimal management of affected animals remains a challenge. Analysis of large-scale primary-care vet data would improve understanding of DMVD.

Aims

- Document the prevalence of and identify risk factors for DMVD in primary-care veterinary practices in the UK.
- Describe the management and survival characteristics of affected dogs.

Methods

Study design

- Cross-sectional and retrospective cohort study.

Data collection

- Electronic patient records (EPRs) shared with the VetCompass project (2) for dogs attending primary-care veterinary practices in the UK between January 01, 2010 and December 31, 2011.

Study population

- *Diagnosed* cases were defined as dogs with a stated diagnosis of DMVD (or synonym) recorded in their EPRs.
- *Possible* cases were dogs >1 year old with a documented heart murmur consistent with a diagnosis of DMVD.
- The cross-sectional study population was restricted to dogs >1 year old.

Data analysis

- Prevalence adjusted for the sampling approach and descriptive statistics were calculated for the study population.
- Mixed effect logistic regression models identified variables associated with a diagnosis of DMVD.
- Kaplan-Meier survival curves and log rank tests explored survival.
- All analyses used Stata 13 (Stata Corp. Texas US).



Results

Prevalence estimate

- **Denominator:**
 - 111,967 dogs attending 93 clinics
- **Diagnosed DMVD cases:** 405 dogs
- **Possible DMVD cases:** 3557 dogs
- **Apparent prevalence**
 - Diagnosed DMVD: 0.36% (95%CI: 0.29 – 0.45%)
 - Diagnosed and possible cases: 3.54% (95% CI: 3.26 – 3.84%)

Descriptive statistics Diagnosed DMVD cases

- **Age disease first recorded:**
 - Mean 9.5 years (SD 3.2)
- **Maximum recorded bodyweight:**
 - Median: 10.9kg (IQR 8.3 - 15.8kg)
- **Sex:** 252 (62.2%) males
- **Insurance status:** 264 (68.9%) insured
- **Deaths during follow-up:** 212 (52.3%) died
- **Cardiac deaths:** 84 (39.6% of deaths)

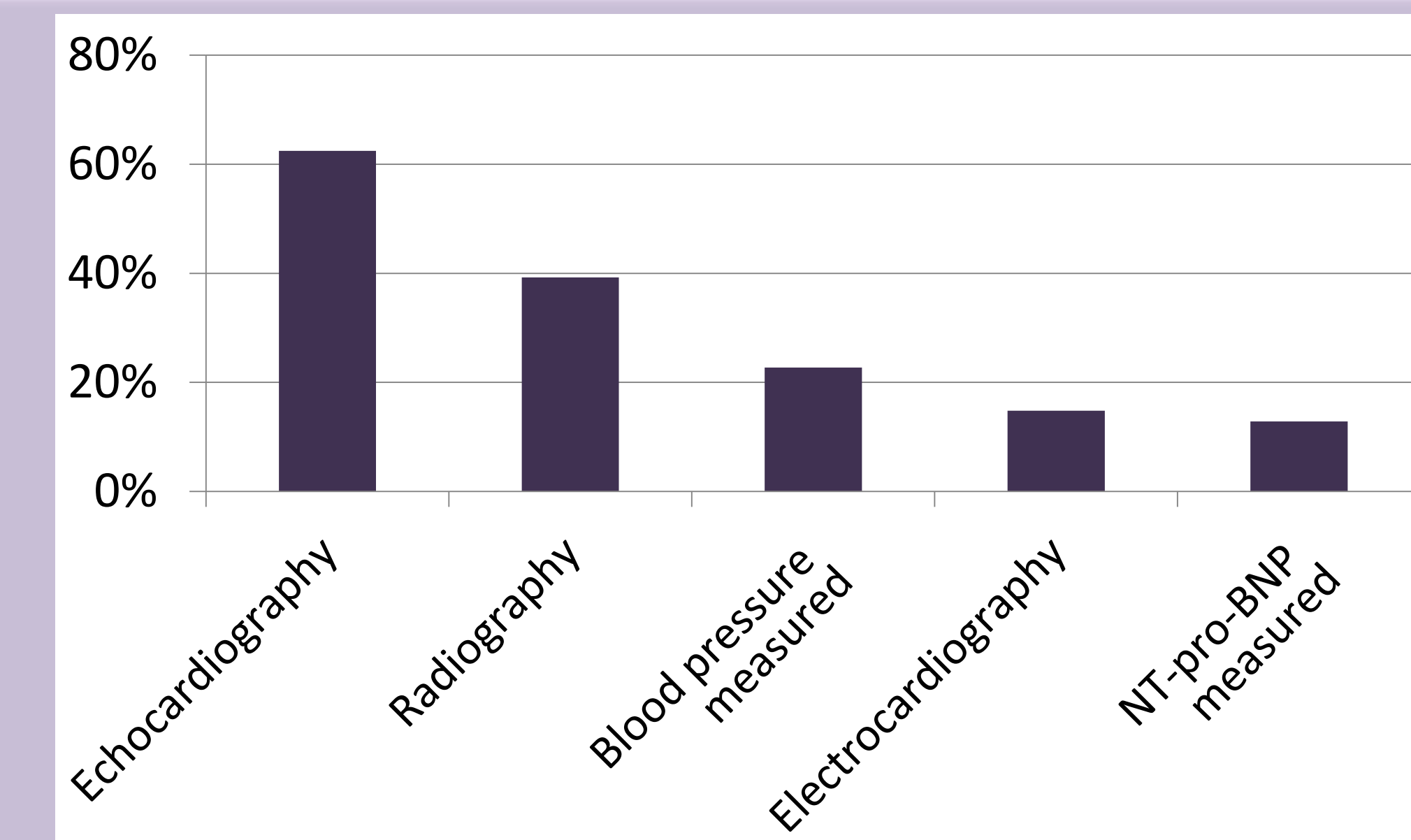


Figure 1. Diagnostic procedures undertaken in 405 dogs diagnosed with DMVD

Risk factor study

Factors associated with an increased risk of DMVD diagnosis:

- Certain breeds (Table 1)
- Being male
- Older age
- Being insured
- Weighing <20.0kg



Table 1. Risk factors associated with diagnosed canine DMVD in multivariable logistic regression analysis. Veterinary clinic was included as a random effect due to clustering ($\rho=0.17$, $P<0.001$).

Variable	Odds ratio	95% CI
Breed		
Cavalier King Charles Spaniel	47.37	31.56 - 71.09
King Charles Spaniel	36.49	18.90 - 70.47
Chihuahua	6.16	2.85 - 13.30
Whippet	4.73	1.88 - 11.87
Poodle	2.92	1.38 - 6.17
Shih Tzu	2.89	1.47 - 5.67
Yorkshire Terrier	2.15	1.28 - 3.61
Border Collie	2.02	1.12 - 3.63
Crossbred	~	Baseline

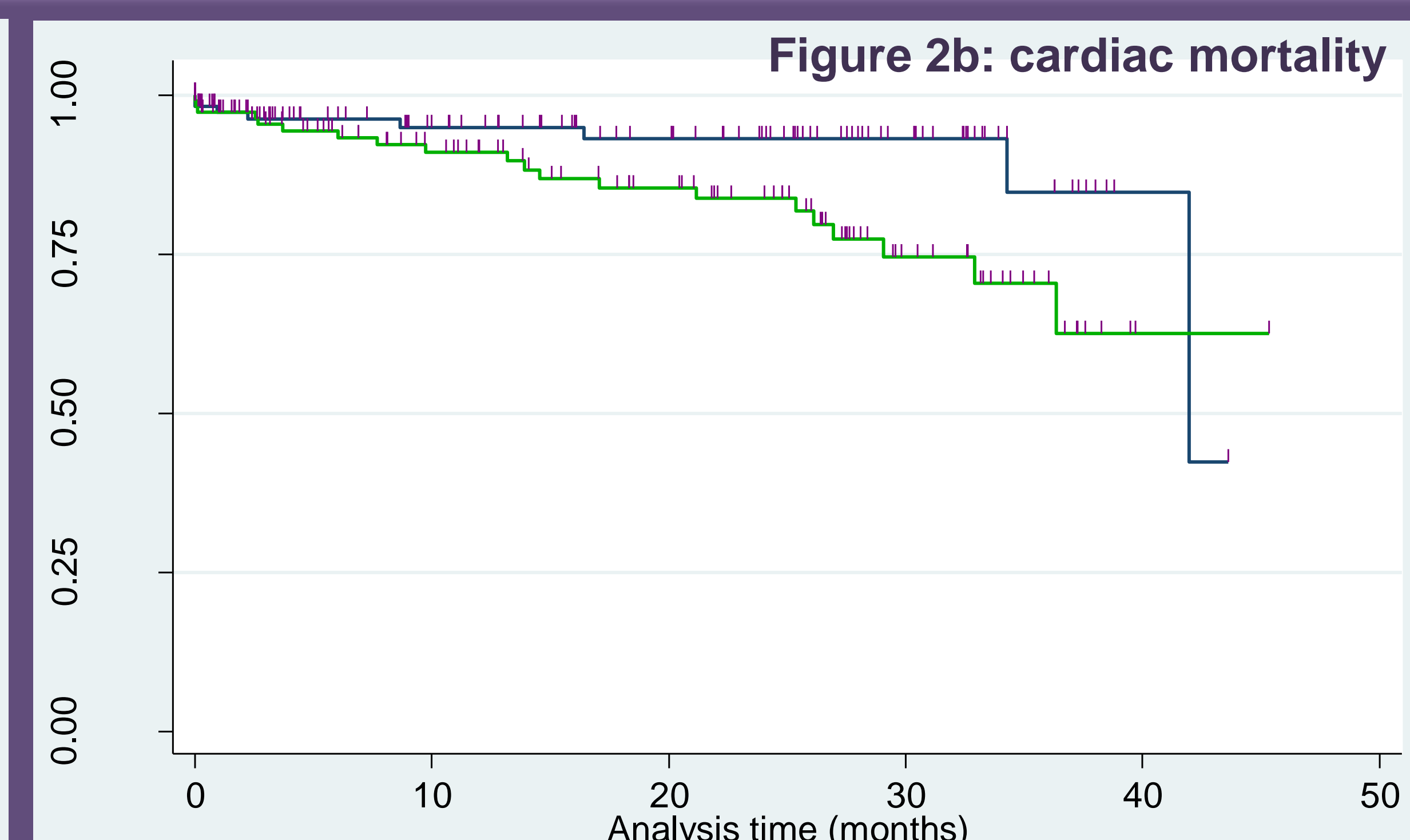
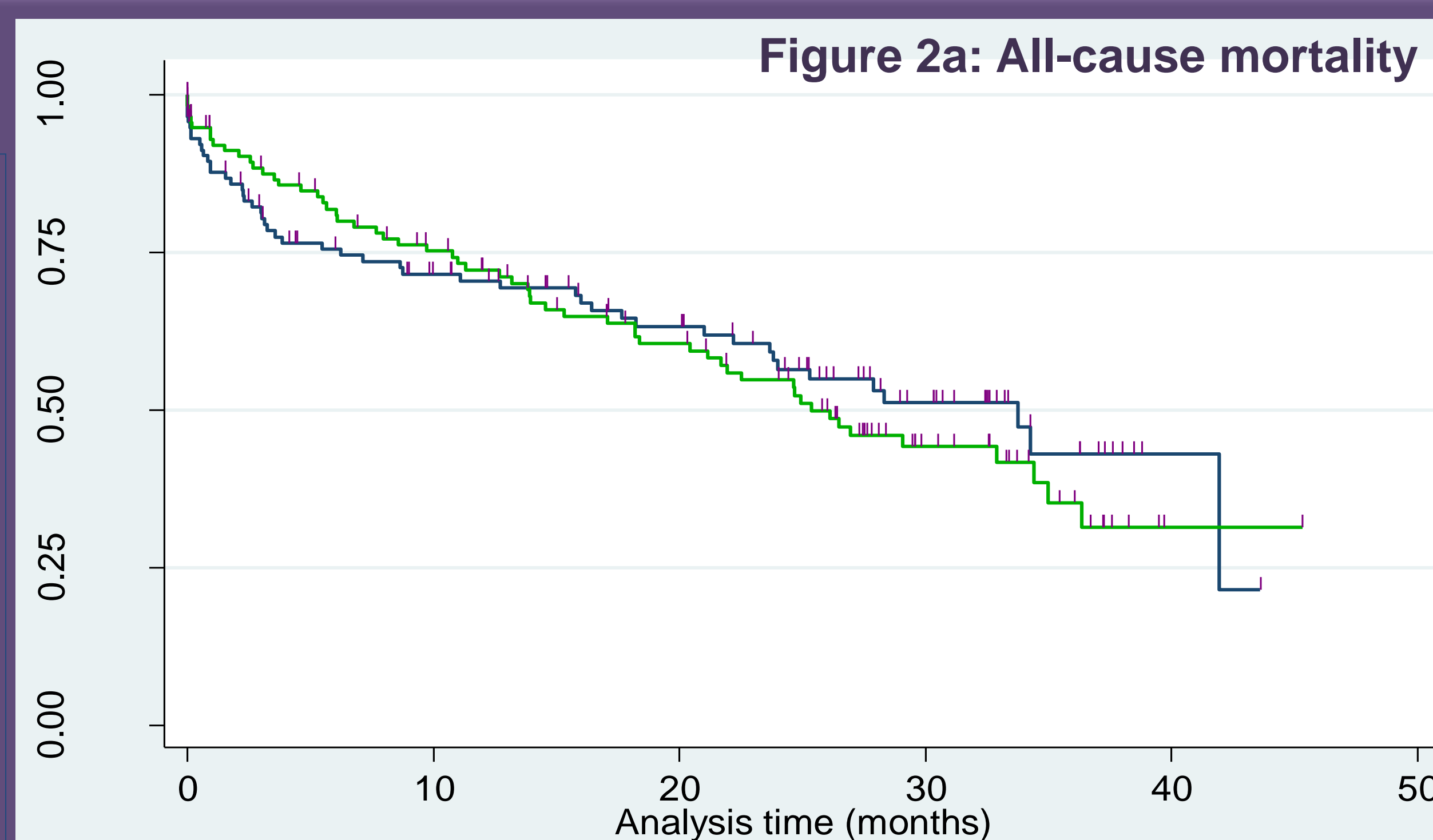
Variable	Odds ratio	95% CI
Sex		
Female	Baseline	~
Male	1.40	1.12 - 1.74
Age at last consultation (years)		
1.0 - <4.0	Baseline	~
4.0 - <7.0	7.03	3.60 - 13.72
7.0 - <10.0	38.24	20.29 - 72.08
10.0 - <13.0	101.61	53.79 - 191.94
≥13.0	150.76	78.11 - 290.96
Insurance status		
Not insured	Baseline	~
Insured	3.56	2.79 - 4.55
Maximum bodyweight (kg)		
<20.0	Baseline	~
≥20.0	0.51	0.36 - 0.74

Survival characteristics

Figure 2: Kaplan-Meier survival curves for a) all-cause mortality and b) cardiac death in DMVD cases. Survival time represents the time from when the disease was initially detected until the time of death.

There was no evidence for a difference in survival of diagnosed and possible DMVD cases for all-cause mortality ($P=0.6309$). However, diagnosed cases had a higher hazard of death than possible cases for cardiac mortality ($P=0.0344$).

— Possible DMVD
— Diagnosed DMVD



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References

1. Buchanan JW (1999) Prevalence of Cardiovascular Disorders, in Textbook of Canine and Feline Cardiology, P.R. Fox, D. Sisson, and N.S. Moise, Editors. Saunders, W.B.: Philadelphia. pp457-470.
2. VetCompass. VetCompass: Health surveillance for UK companion animals. <http://www.rvc.ac.uk/VetCompass> 2014 [cited 2014 September 02]

Conclusions

DMVD was typically diagnosed in older small to medium sized dogs in this population of dogs attending primary-care practices. Median survival time was 2-3 years from the time the disease was first detected. These findings could aid clinical diagnosis and prognosis in practice.