Setting clinical reporting thresholds for canine epidemics in the UK

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Background

The **Small Animal Veterinary Surveillance Network** (**SAVSNet**)[1] harnesses growing volumes of electronic health records from veterinary practices and diagnostic laboratory results to detect canine epidemics. Outbreaks are declared when statistically significant anomalies are detected in these data by mathematical models. However, to date, there are no validated methods to establish which of these anomalies constitute outbreaks that have a significant impact on everyday life in veterinary practice.

Methodology

We conducted in-depth interviews with UK veterinarians, to establish clinical reporting thresholds for six canine diseases. Two parameters were discussed: the diseases' case incidence and the alerts' predictive values. To draw the study sample frame, we looked at three characteristics: years of experience in practice, practice size and whether they contributed data to SAVSNET. Interviews were transcribed and a thematic analysis was performed using the software *NVIVO12*.

Aims of the study

1. To determine reporting thresholds considered of practical importance by companion animal clinicians.
2. To investigate outbreak predictive values suitable for veterinarians in clinical practice.

Results

Five veterinarians participated, and thirty interviews were conducted to cover the six diseases of interest.
Figure 1 illustrates how the case incidence to trigger an outbreak notification could be much higher according to the clinically relevant threshold, thus increasing the reporting system's specificity and not overloading clinicians with information.
Table 1 shows a summary of veterinary practitioner's responses during the conducted in-depth interviews. Case incidence and alert predictive values considered of relevance by participants are presented as a range reflecting the diversity in participant's opinion.
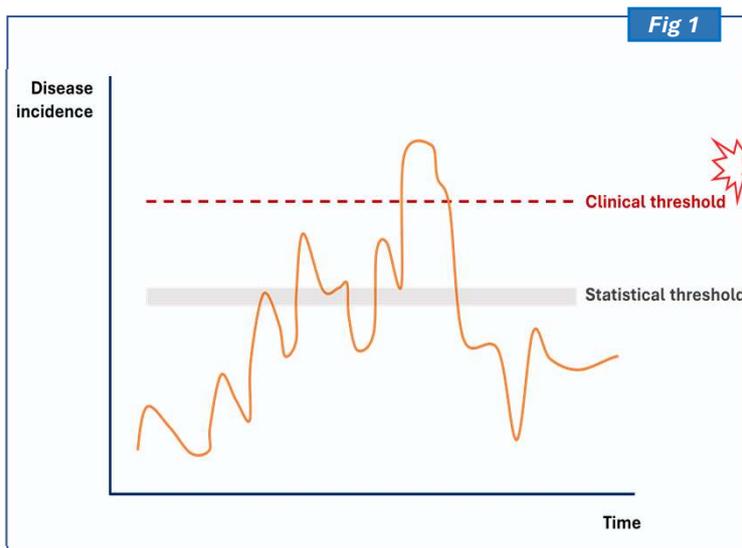

Fig 1. Depiction of the rationale of this study; clinical and statistical reporting thresholds might be triggered at different numbers of disease incidence.

	Canine disease	Case incidence range	Predictive value range
Endemic	Leptospira	1-3 cases/month	95-99%
Endemic	Parvovirus	>3-6 cases/week	95-99%
Exotic	Leishmania	>0 cases	90-95%
Exotic	Babesia	>0 cases	80-90%
Syndrome	Respiratory	3-5 times over baseline/week	95-99%
Syndrome	Gastrointestinal	2-4 times over baseline/week	90-95%

Table 1. Summary of the case incidence and predictive values proposed by participants to characterise clinical outbreak reporting thresholds.

Conclusion

We propose an innovative methodology to inform the development of an outbreak notification system of canine infectious diseases by enriching statistical signals with qualitative information derived from practitioners' opinion. These thresholds will be implemented on SAVSNET, and contribute to the improvement of the UK's preparedness for dealing with canine epidemics.