SAVSNET

Research Surveillance Benchmarking

Winter 2022

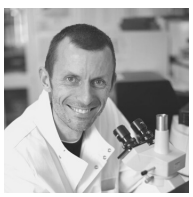
It is such a nice time of year Christmas, no matter our background or beliefs, giving us chance to look back on the year just gone.....they seem to go very quickly these days! In SAVSNSET we have said goodbye to some wonderful colleagues. Cassandra Raby is now a lecturer at Leeds University, and Jodie Jackson, who completed her Masters on ageing dogs, now works for a Pet Nutrition Company – it always makes me think we are doing something right when our colleagues can use their time with SAVSNET to help them move onto the next stage of their careers. And of course this also allows us to welcome new members to the team. Hayley Jones joins us as a mathematician with expertise in machine learning to work on our Petplan vaccines project. We will also welcome Faizal Jawed to a PhD early in the new year who will work with PJ Noble on applying machine learning to veterinary clinical texts – since we have nearly 10million records now we certainly can't read them all 😊

We are also extremely grateful to those organisations who have funded new research projects with us this year. With generous funding from Petplan Charitable Trust we will be further develop our work on a pet animal tumour registry working in collaboration with colleagues at the University of Las Palmas in Gran Canaria, adding a powerful international dimension to our work. And recognising the fact we get data on all pet species, we will start a new PhD in partnership with Burgess on exotic animal health and welfare. Finally, our Equine colleagues are starting to collect their own data; building on their efforts has also allowed us to start a pilot to collect health data on farm animal species.

As a research group we have published work on a range of subjects from euthanasia to ear cropping, from cardiovascular disease to epilepsy to lymphoma. We have also continued our work funded by Dogs Trust to understand the changing seasonal patterns of gastrointestinal disease in dogs that seems to be caused by new variants of canine enteric coronavirus. In addition, SAVSNET science now underpins five publicly available dashboards (https://public.tableau.com/app/profile/savsnet.at.liverpool/). Listing these outputs just reminds me of the diversity of the research we are able to carry out in our small-but-perfectly-formed team. Of course none of it would be possible without the kind participation of vets, nurses and laboratories across the UK who continue to submit data and samples to us – they are top people!

Happy Christmas to you all.

Alan and the SAVSNET Team



What's Inside?

Canine Enteric Coronavirus (CeCov)

We will be analysing data submitted to SAVSNET both from veterinary practices and labs again this year.

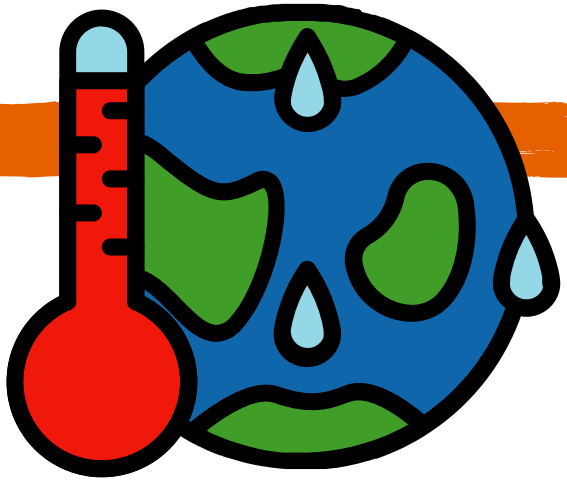
We are also collecting samples to test here at Leahurst so if you have a suspected case, please let us know! savsnet@liverpool.ac.uk

Welcome to our new team members

Katey Anderon has joined us to complete a part-time PhD funded by Dogs Trust using SAVSNET data to explore canine behavioural issues. Katey has a degree in Bioveterinary Science and MRes in canine health, behaviour and welfare which was completed with the VetCompass team.

Find out more **here**

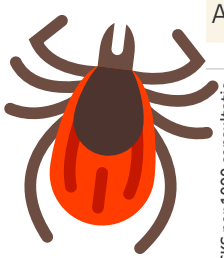
Hayley Jones is our new post-grad epidemiologist, funded by Petplan to investigate the factors affecting vaccine uptake in companion animals. Hayley has an undergraduate degree in Mathematics, an MRes in Decision Making under Risk and Uncertainty and is completing a PhD in image analysis in histopathological whole slide images of Uveal melanoma (UM) and mathematical modelling of drug uptake in UM spheroids in January 2023.

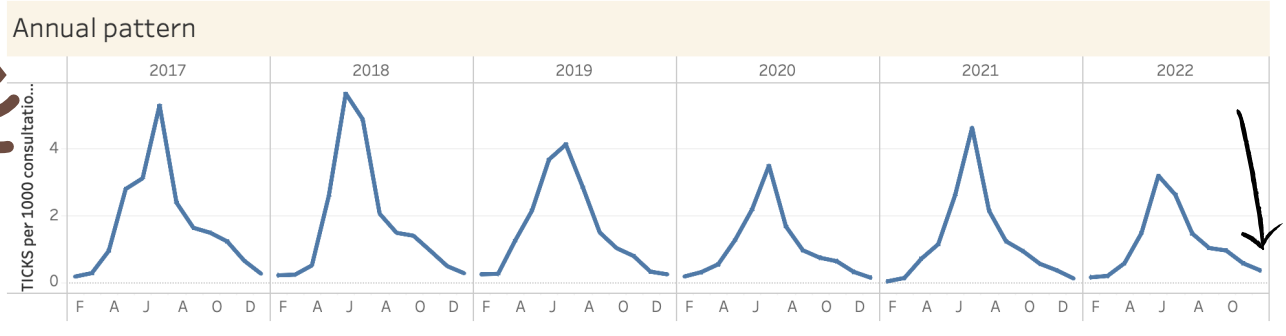


Is a changing climate having an effect?

2022 has brought some particularly mild weather and we may be seeing some effects of this in the data we receive. Ticks are still being found on animals seen in practice in December, and we are still finding cases of grass seeds in December too.

You can see near real-time data on our Tableau page **here**





Why should it just be for smallies? Surveillance for other species...

Since SAVSNET's beginning in 2008, we have worked to set up a network that could receive large volumes of data relating to small animals seen in veterinary practices for research and surveillance. Today, SAVSNET's model and outputs have received attention from across the globe including from those colleagues working in different sectors of the veterinary profession.

This year has seen plans for the Equine Veterinary Surveillance Network (EVSNET) really begin to take shape and the development of the Farm Animal Veterinary Surveillance Network which will be launched in the new year.

EVSNET

EVSNET is funded by the Horse Trust and forms part of a PhD for Dr April Lawson, led by Professor Gina Pinchbeck. The network is based on the SAVSNET model, tailored to equine veterinary practices. EVSNET has been receiving laboratory data since last year and is now at the stage of recruiting practices to collect veterinary practice data.

If you use RoboVet or Eclipse, see equine patients and are up for supporting equine research and surveillance, please get in touch!
evsnet@liverpool.ac.uk

April's labrador, Phoebe

FAVSNET Farm Animal Veterinary Surveillance Network

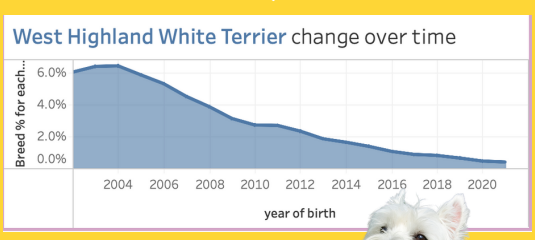
This year saw the start of development for FAVSNET, funded by Arwain DGC as part of a pilot to progress farm animal surveillance. This project is led by Professor Alan Radford. We will be going live with FAVSNET in 2023 and look forward to working with data typically for large groups of animals as opposed to individuals.

Arwain DGC
Defnydd Gwrthficrobaidd Cyfrifol
Responsible Antimicrobial Use


Ivo's trio of canine buddies Brufen, Cacau and Reggie (L-R)

What happened to the Westie?

Our data indicates some decline in brachycephalic breeds such as the pug and french bulldog which may be an effect of awareness campaigns. The Doodles remain popular. Interestingly, the West Highland White Terrier has seen a pretty dramatic decline over the years.
Why might their popularity have decreased?



Explore our breed data here

Research updates

Catch up with the progress of four of our post-graduate researchers

Jodie Jackson - Old Age Pets Project funded by PetSavers

I'm so pleased to have passed my MPhil Viva after two years of completing my masters working from home - a massive sense of achievement, although bittersweet that I didn't get to complete it with my amazing SAVSNET and University of Liverpool colleagues in person! That being said, I couldn't have asked for a better virtual team, and I can't wait to celebrate with them in person! They were always at the end of a teams call or email for help and support, or just a good chat and giggle over virtual escape rooms! Since completing my masters I have started a new role as an Operations Trainer at the Waltham Petcare Science Institute, and absolutely love training cats and dogs every day!

Shona Bloodworth - Vaccine hesitancy funded by PetSavers

I've been working with SAVSNET data exploring vaccination trends in dogs and cats. The data indicate that vaccination rates have been slowly reducing in both species between 2016-2021. In both species increasing age also reduced the likelihood of an animal being vaccinated. Models produced from the data I have been able to show that pets that are neutered are more likely to have a record of a vaccination compared to entire animals. Further analysis has also shown that pets of owners living in more deprived areas are less likely to have a record of a vaccination. To better understand the trends that I have described in companion animal vaccination uptake in the SAVSNET data, I am now conducting one to one in-depth interviews with dog and cat owners. The interviews focus on how owners view vaccinations for their pets and the factors they feel have influenced the approach to vaccinating (or not vaccinating) their pets. In the new year I will begin recruiting small animal vets for interview to get their professional perspective to further the develop the qualitative component of the project. In August this year I had the opportunity to present the findings from the work I have been doing with vaccination data from SAVSNET at the International Symposium of Veterinary Epidemiology and Economics. The conference took place in Halifax Nova Scotia and I had a fantastic few days meeting researchers from across the world working in similar fields. It was great to be able to represent SAVSNET along with Carmen and Charlotte from SAVSNET Agile.

If you'd like to be involved, please let us know!

Heather Davies - Identification and reporting of adverse drug reactions funded by the VMD

I'm now in the final stages of my PhD and having spent the last couple of months writing I'm almost ready to submit my thesis! During my PhD we have conducted a survey of veterinary professionals to better understand the barriers and facilitators to reporting adverse events (AEs). We have also developed and launched an AE reporting button onto the SAVSNET window for Robovet users. Reports submitted via the button are sent directly to the VMD from SAVSNET. We have also explored the use of the clinical records in SAVSNET for identifying AEs to particular drugs. We have developed complex search terms for identifying specific clinical signs representative of the AEs of interest, and used these terms to compare the incidence of AEs in animals exposed to particular drugs and comparator products.

Sean Farrell - Natural Language Processing advances to better understand drivers of antibiotic use

This year we saw SASVNET move more significantly into the use of large language models to aid in the mass classification and understandings that lie within our dataset. Firstly, we trained our own in-house language model based on the masked language approach devised by the innovators behind BERT, a large language model developed by Google. Using our SAVSNET inspired BERT model we have trained downstream tasks such as the identification and understanding of the associated causality and risk factors behind why an animal has died, and for the first time considered a lifetime of consultations as a cumulative input rather than independent events. More recently, we have aimed to reclassify our dataset with the 'International Classification of Disease II' disease coding framework as proposed by the WHO for human mortality and morbidity statistics, allowing for a greater insight of the mass status quo of the UK pet population and providing more channels of monitoring for disease breakout surveillance.

Progress from the third year of SAVSNet AGILE

Responsive data intelligence for canine health

SAVSNET-Agile is an exciting multi-organisation collaboration funded by Dogs Trust which focuses on improving canine health by linking SAVSNET data with state-of-the-art informatics, statistics and genomics.

The ultimate aim of the project is to provide veterinary practices with near-realtime actionable health resources, including the detection and response of disease outbreaks and identifying patients at risk of becoming obese and/or diabetic. The project has three post-graduate researchers based at University Bristol, Liverpool and Lancaster supported by a multi-disciplinary supervisory team across the organisations.

Carmen

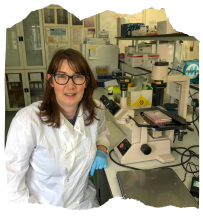
I've completed my PhD's analytical chapters and I'm now writing up the other chapters and conclusions. My PhD includes chapters of canine disease surveillance priorities, text mining to detect specific canine pathogens using veterinary clinical narrative data, developing methods to establish clinically relevant outbreak notification thresholds for veterinary practitioners and using two different sources of data to investigate the preparedness of the UK canine health sector for canine epidemics and make recommendations for the implementation of a nation-wide framework of response.

Ivo

I have been developing and validating new text-mining tools to accurately identify overweight and obese patients, based on body condition score scales and specific textual descriptors and qualifiers. These new tools have a specificity of about 98% and a sensibility of about 99%. This is an important step to identify overweight and obese dogs and to look retrospectively to the clinical records of these canine patients, in order to better understand the clinical context around these patients.
I've also been developing new ways to identify body weight as recorded in clinical narratives, and we are looking into the factors that influence body weight recording. Together, this will allow to apply statistical methods to characterise overweight and obesity trends across different canine breeds. I graduated in July with an MPhil in Veterinary Epidemiology too!

Charlotte

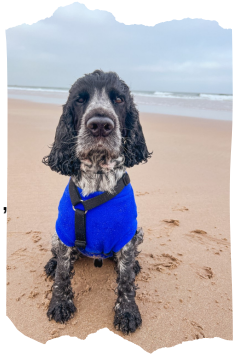
his year, I've focussed on the optimisation of the Gaussian Process methodology already in place with a focus on minimising the chances of 'crying wolf' in regards to outbreak calls. This involves applying a Harmonic Regression on the data prior to the Inference model. So far results are promising with the new method's ability to catch outbreak style patterns which the previous method seemed to have missed. There has also been a strong push towards visualisation and the various avenues to relay this information back to Veterinary Surgeons and Stakeholders.



Shirley

Shirley still needs samples from dogs with **distemper** and is asking vets to be vigilant for **CECoV.** Please contact us if you think you have a case - savsnet@liverpool.ac.uk.

The early results from our distemper work suggest that we can tell where the virus comes from. We are now trying to generate whole genomes to improve the signal from viral sequence - we are always interested in distempers **especially from imported animals.**



Beth's Cocker Spaniel, Harington

This research is kindly funded by Dogs Trust.
Find out more here

University of BRISTOL

EIDS Equine Infectious Disease Surveillance

Lancaster University

UNIVERSITY OF LIVERPOOL

MANCHESTER 1824 The University of Manchester

Publications in 2022 using SAVSNET data

Thank you to all veterinary practices, independent and CVS, and laboratories for making this work possible

Incidence of alimentary and respiratory disease in brachycephalic dogs presenting to primary care veterinary practices participating in the SAVSNET project. Veterinary Record.

Approach to initial management of canine generalised epileptic seizures in primary-care veterinary practices in the United Kingdom. Journal of Small Animal Practice.

UK veterinary professionals' perceptions and experiences of adverse drug reaction reporting. Veterinary Record.

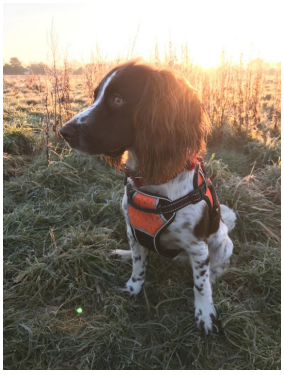
Do socioeconomic factors impact management of suspected canine multicentric lymphoma in UK first opinion practice? Veterinary Record

Analysis of canine cardiovascular therapeutic agent prescriptions using electronic health records in primary care veterinary practices in the United Kingdom. Journal of Veterinary Cardiology.

Surveillance of heat-related illness in small animals presenting to veterinary practices in the UK between 2013 and 2018. Open Veterinary Journal.

Using electronic health records to explore negotiations around euthanasia decision making for dogs and cats in the UK. Veterinary Record.

PJ's cat, Teri



Alan's Sprocket, Jess

Shona's dog, Maris

Full publication list available here

As always, thank you for your continued support of SAVSNET

We have sent you our newsletter because you opted in to the mailing list. If you would prefer to not receive our quarterly newsletter anymore, please contact us at savsnet@liverpool.ac.uk