NIHR Health Protection Research Unit in Emerging and Zoonotic Infections

Utilising social media as an adjunct to traditional zoonotic surveillance systems.

A case study: Lyme disease and dogs in the UK and Ireland

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What is social media?

Social media are websites and applications that allow users to share and create content, and to participate in building social networks

Twitter

A microblogging site

Statements of 280 characters

6000 tweets per second

>330 million users worldwide

22% of adults in UK (14.6 million)
28% of adults in Ireland (1.3 million)

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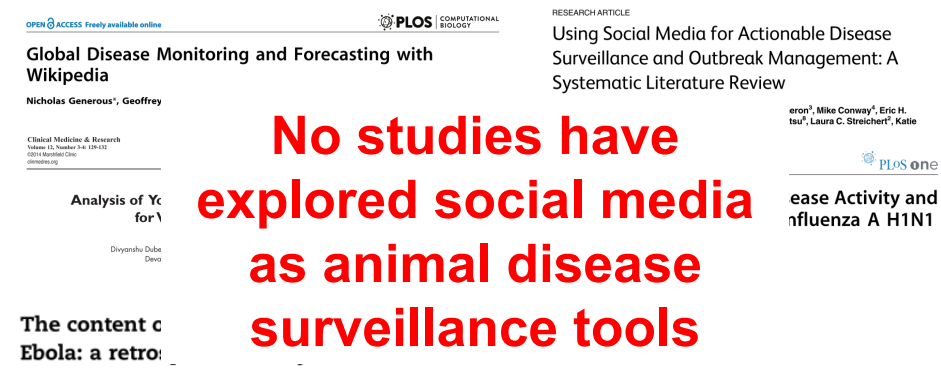
How can it be utilised for disease surveillance?



Global Disease Monitoring and Forecasting with Wikipedia

Nicholas Generous*, Geoffrey

Using Social Media for Actionable Disease Surveillance and Outbreak Management: A Systematic Literature Review

eron[3], Mike Conway[4], Eric H. tsu[5], Laura C. Streichert[2], Katie

PLOS one

ease Activity and nfluenza A H1N1

Analysis of Yc for \

Divyanshu Dube Deva

The content c Ebola: a retro

No studies have explored social media as animal disease surveillance tools

Forecasting Emergency Department Visits Using Internet Data

Andreas Ekström, M Ed; Lisa Kurland, MD, PhD; Nasim Farrokhnia, MD, PhD; Maaret Castrén, MD, PhD; Martin Nordberg, MD*

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Objective

- To compare human and canine twitter datasets to known epidemiological data.
- Identify themes raised about canine Lyme disease

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Case Study: Lyme disease: Methods

Tweets from the UK and Ireland (July 2017 - June 2018) were searched for the word 'Lyme'. Dog and human subsets were generated.

Trends in seasonality and geography were compared to published figures.

Data was explored for word frequency, sentiment analysis, and impact.

Case Study: Lyme disease: Results

5,212 users tweeted 13,757 tweets containing 'Lyme'
165 users tweeted 205 tweets containing 'Lyme' and 'dog'.

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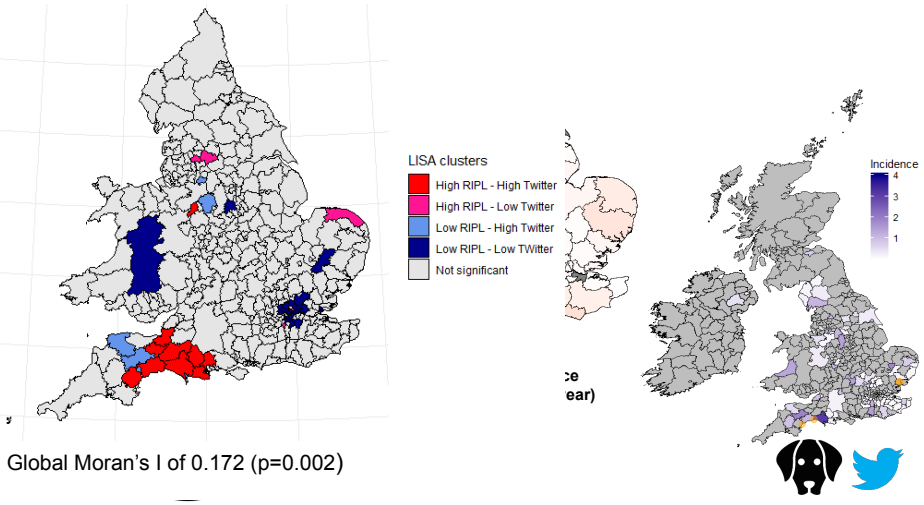
Case Study: Lyme disease: Results - Geography



Global Moran's I of 0.172 (p=0.002)

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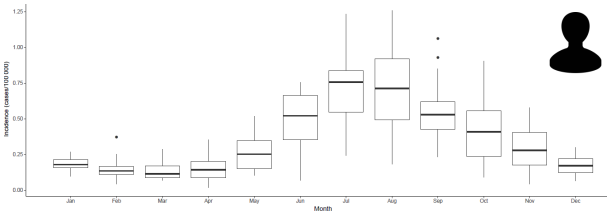
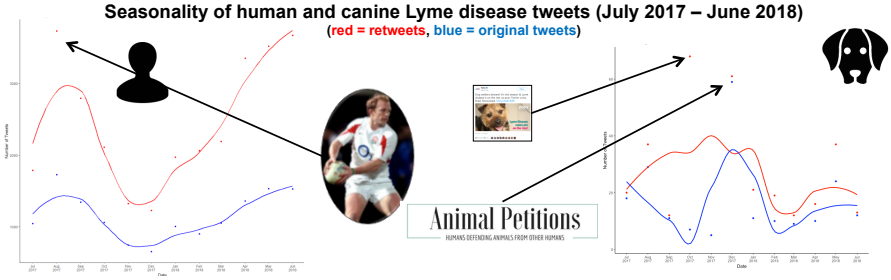
Case Study: Lyme disease: Results - Seasonality



Seasonality of human and canine Lyme disease tweets (July 2017 – June 2018)

(red = retweets, blue = original tweets)



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Case Study: Lyme disease: Results – Content & Emotions

The most impactful tweet

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Discussion and Conclusions

Twitter may be useful in assisting in Lyme disease surveillance.
It can be analysed in real-time and identify potential disease hotspots
Can provide a deeper social understanding of owner concerns and behaviour to diseases, and therefore lead to better relationships with them.

Limitations

Substantial risk of false positives
How representative are the users?
Echo-chambers of members views
Data for canine Lyme disease is too small

Perspectives

Such data can guide veterinary public health practitioners in the education of the public about the relative risk that Lyme poses to pets and its mode of transmission.

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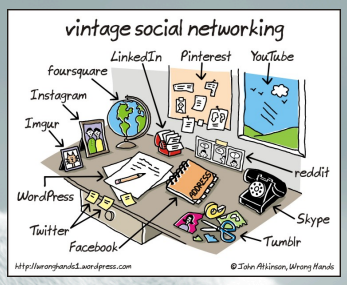

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