

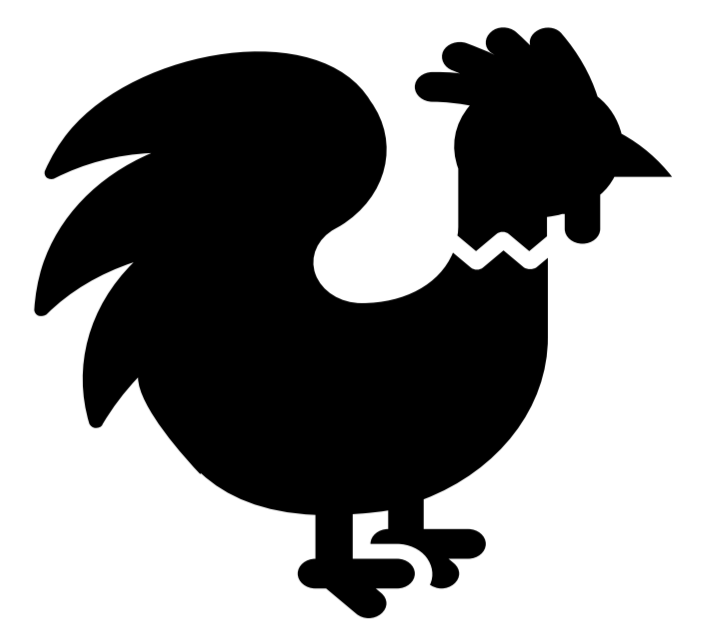
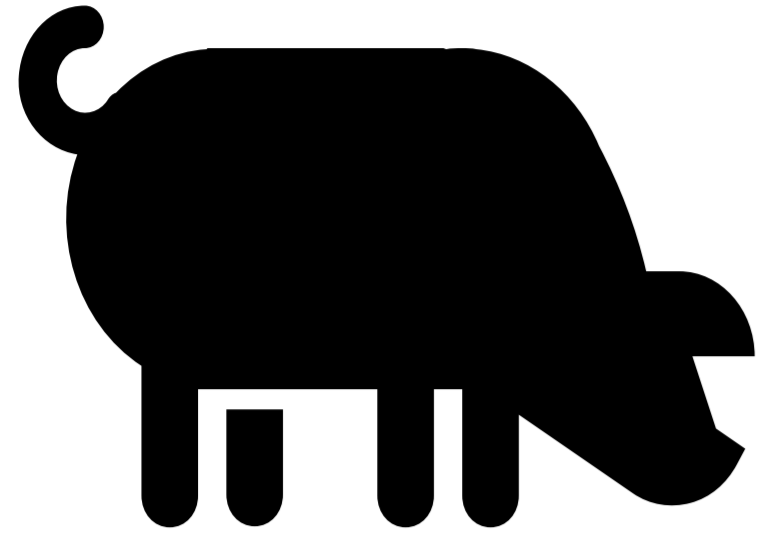


Utilising social media data for veterinary epidemiological surveillance

A. Samuel Munaf^{1,2}, Kevin Swingler¹, Franz Brülisauer³, Anthony O'Hare¹, George Gunn², and Aaron Reeves²

¹ Division of Computing Science and Mathematics, University of Stirling, ² Epidemiology Research Unit, Department of Veterinary and Animal Sciences, Northern Faculty, Scotland's Rural College (SRUC),

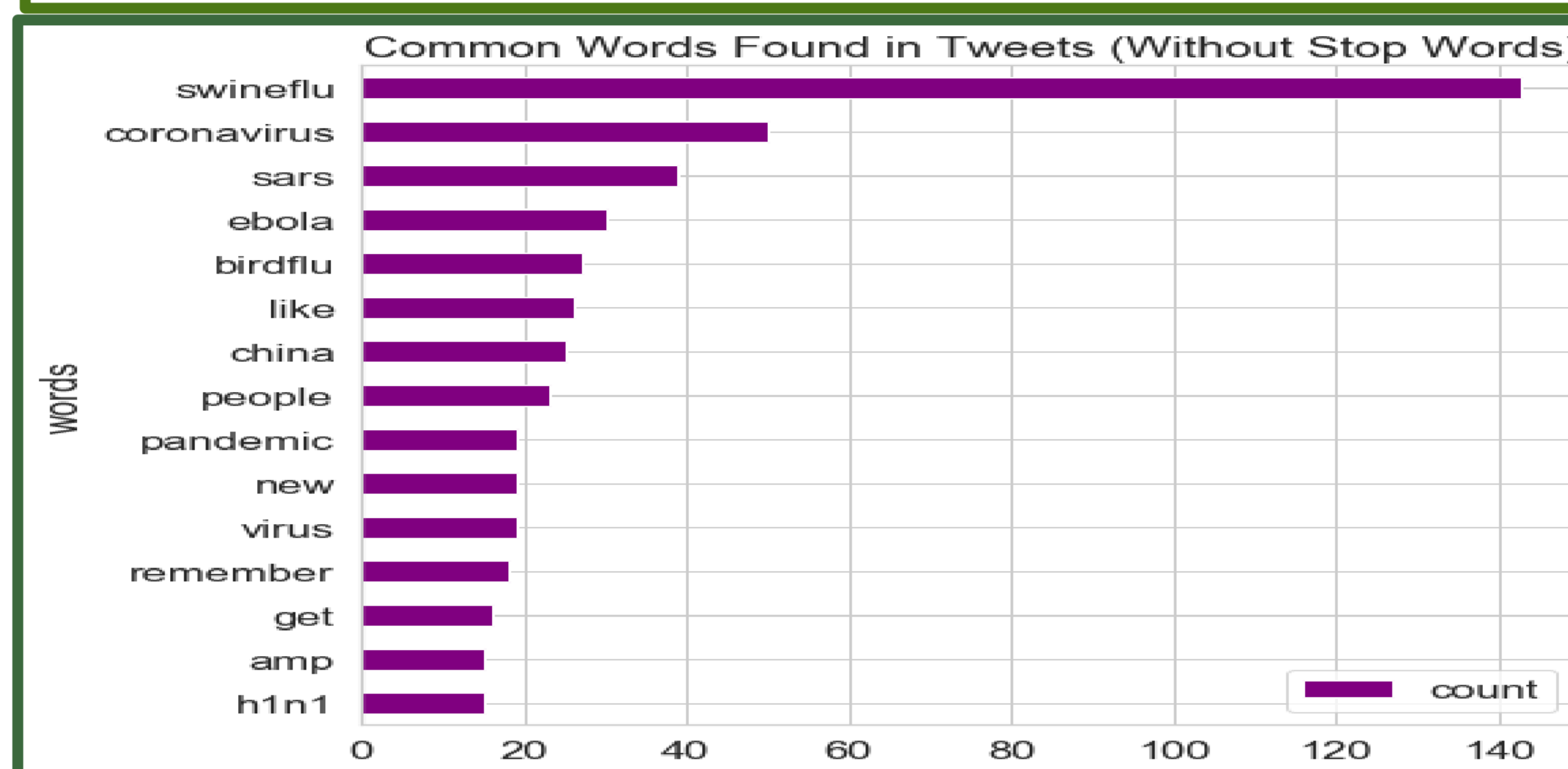
³ SRUC Veterinary Services, Scotland's Rural College (SRUC)



Project Overview

To gain insights about Smallholder pig and poultry farmers through the application of social media data sources in order to:

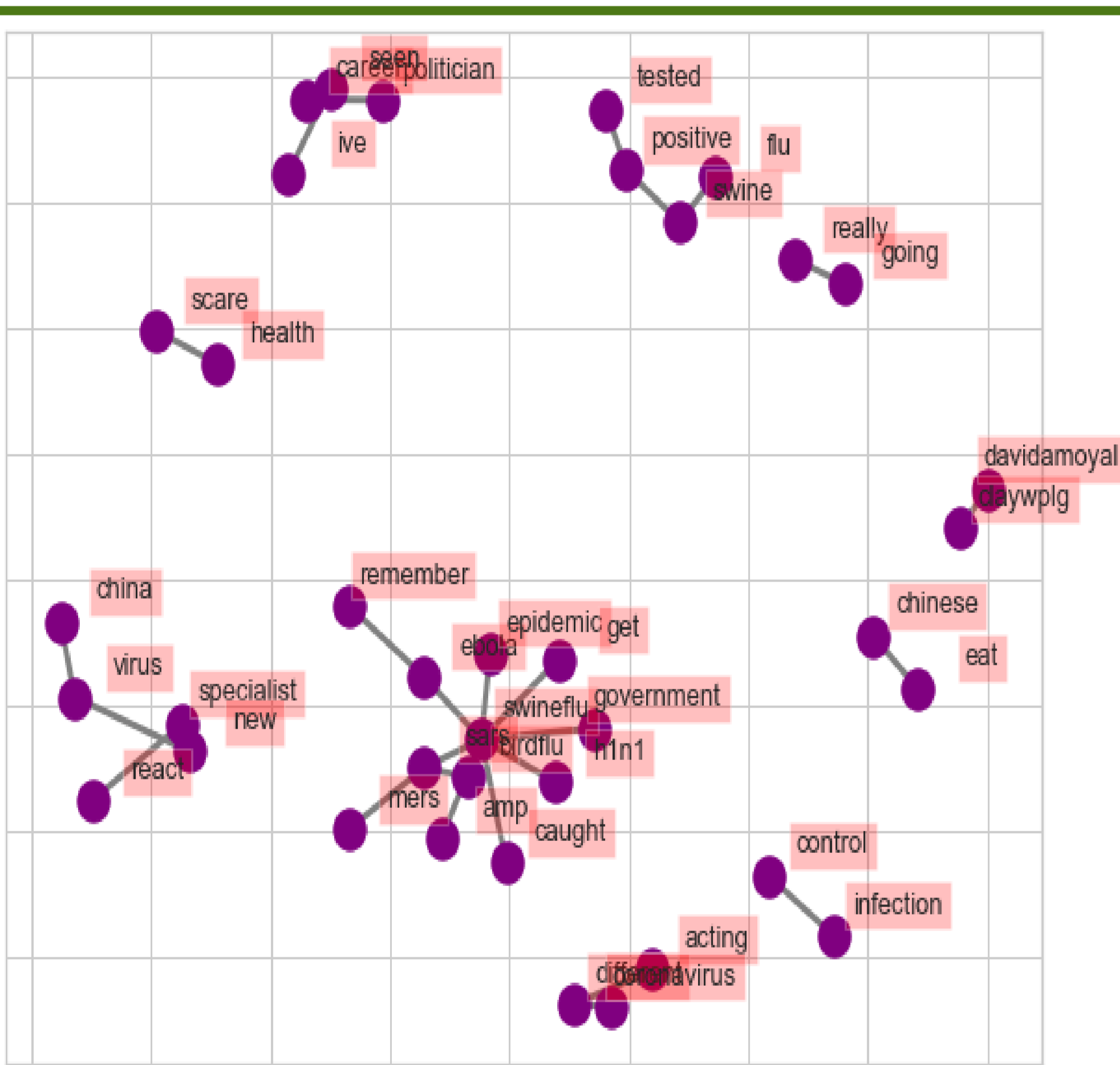
- To better inform current knowledge of location, demographics and interaction networks
- Achieve early detection of disease
- To compare any trends identified to known animal health related events



Word frequency graph for twitter hashtags related to pigs and poultry (Jan 2020)

Approach

- Extracting messages over various time periods based on spatial constraints and keyword filters
- Applying web scraping techniques to derive user profile information, location, posts and interactions
- Sentiment analysis to ascertain user feelings regarding outbreak/public health information/news
- Text mining of posts
 - Natural language processing, topic modelling and word frequencies
- Network analysis of:
 - Keyword search terms
 - User message interactions
 - Information dispersion via friends/followers
- Image classification of disease

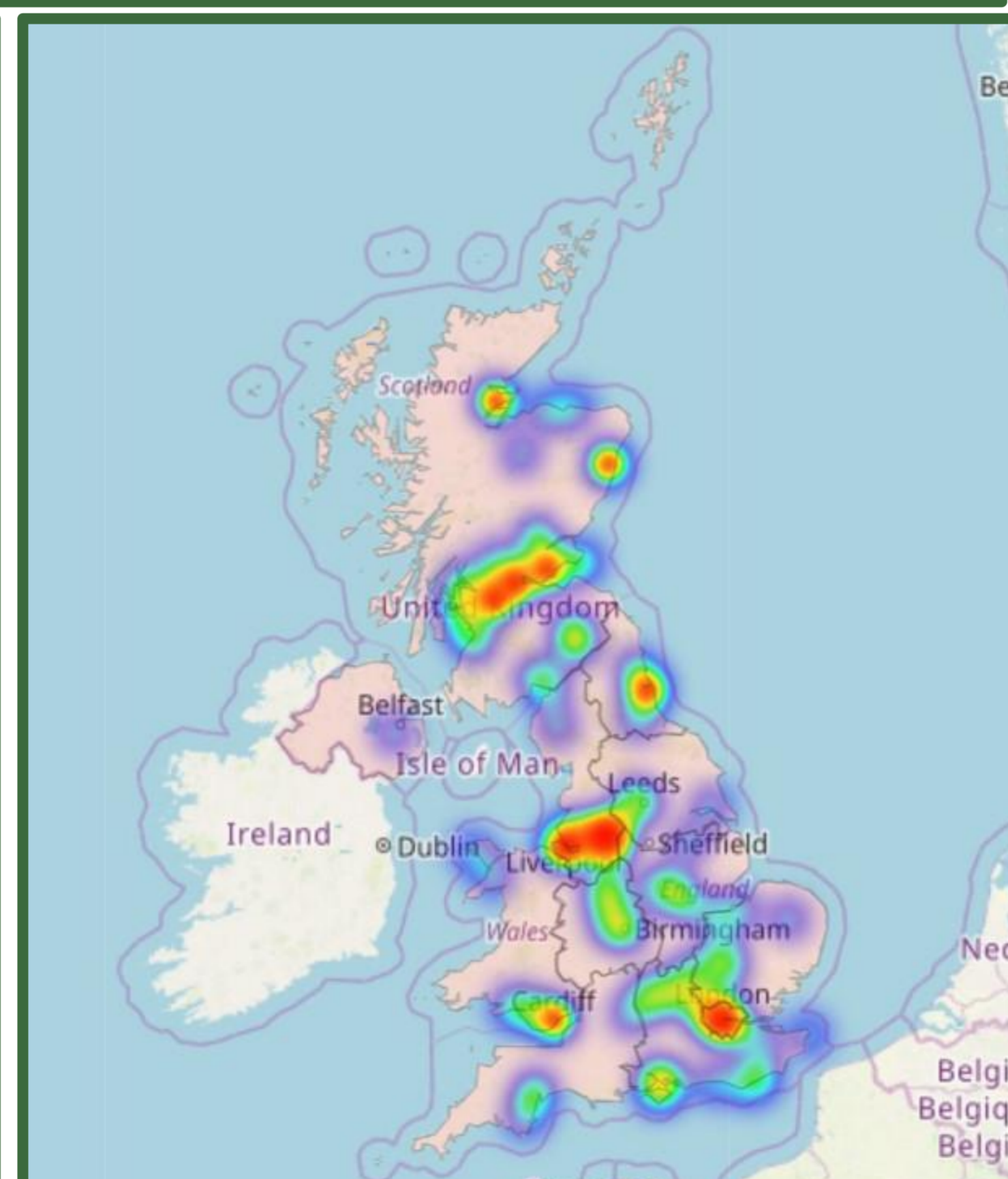


Network of swine flu and avian flu twitter search terms (Jan 2020)

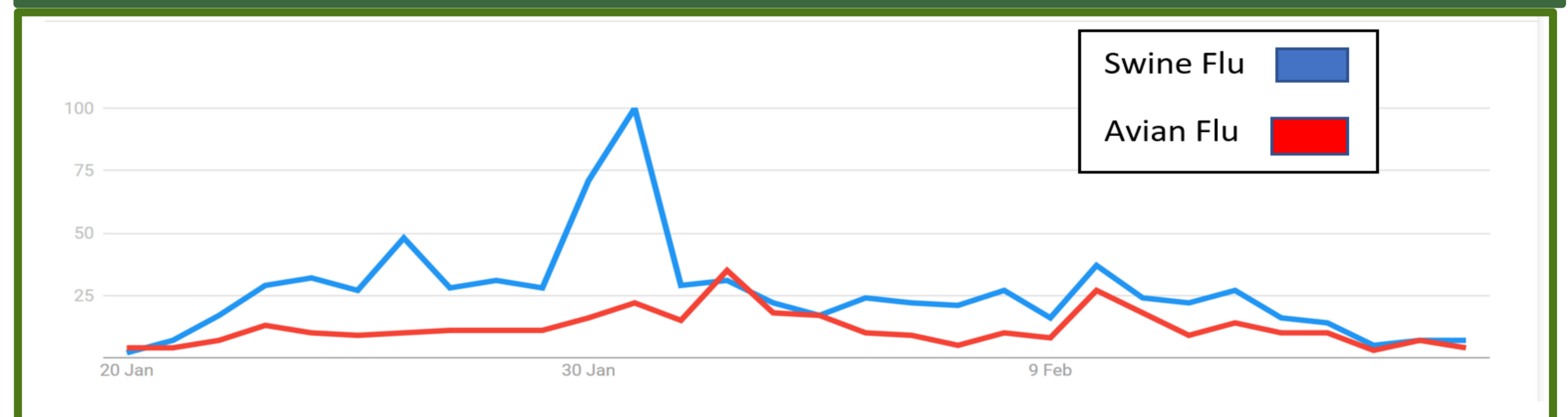
What is Infoveillance?

“The science of distribution and determinants of information via the internet with the ultimate aim to inform public health and public policy”

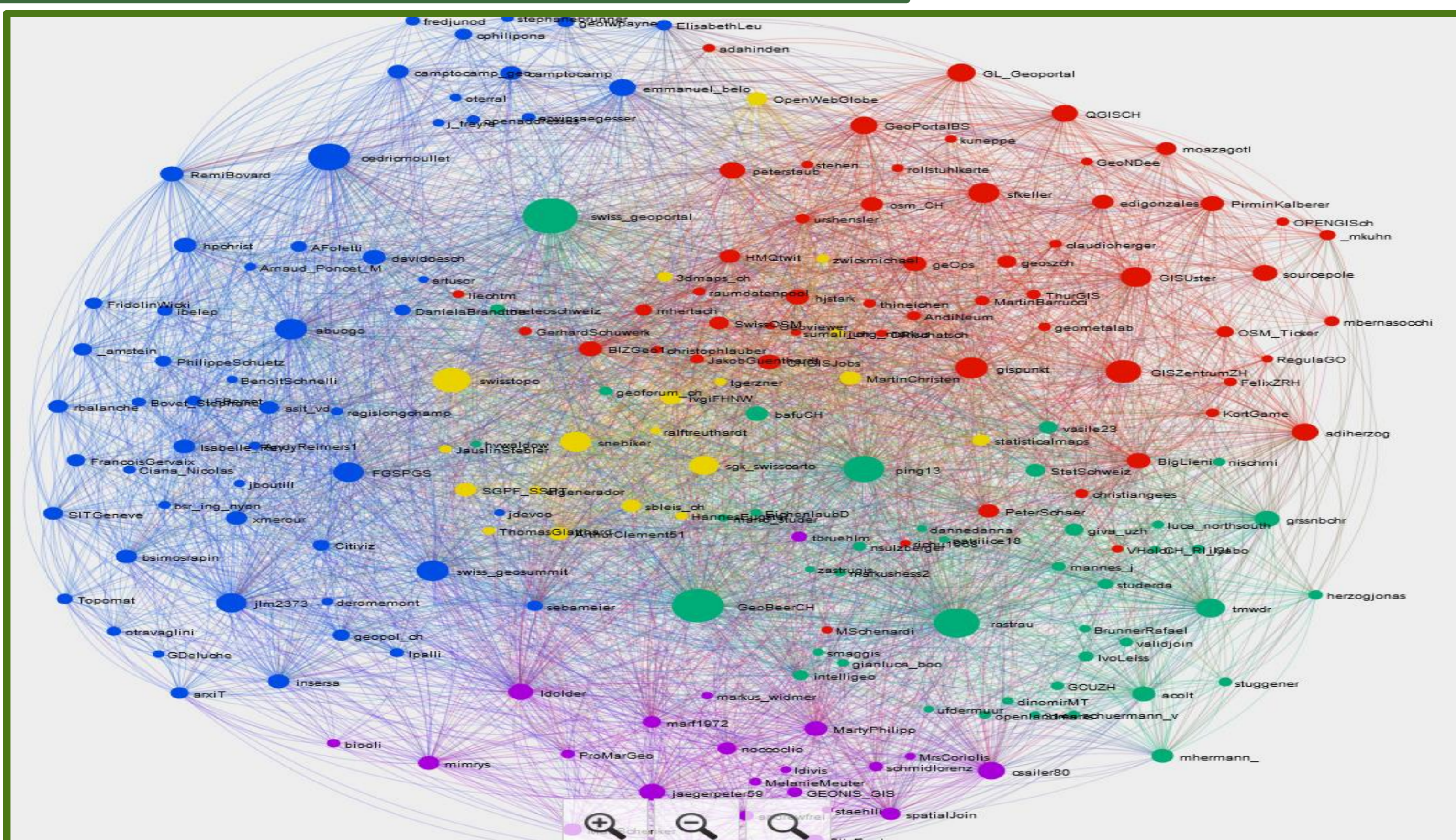
(Eysenbach, G 2009)



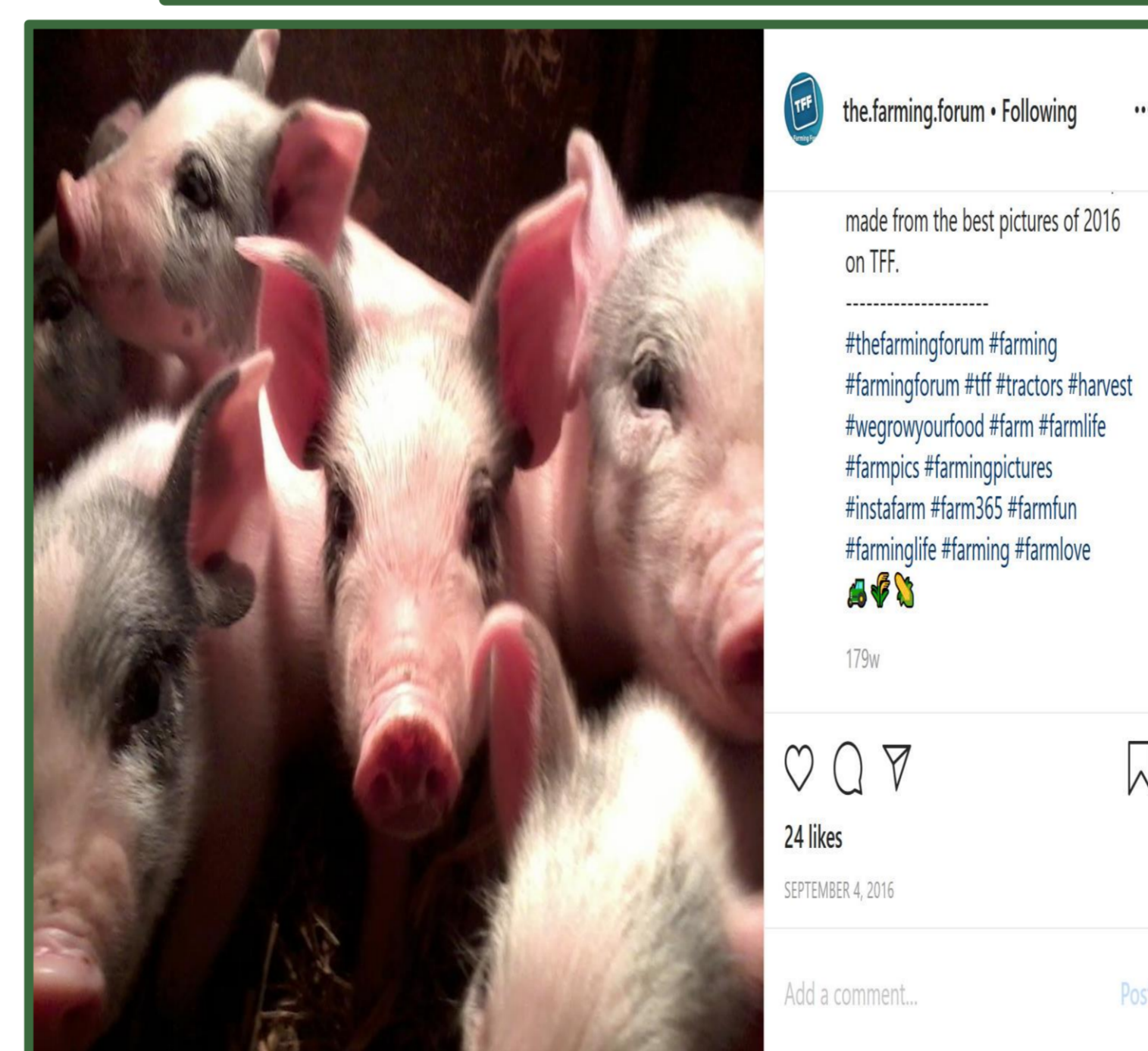
Geolocation map of swine flu related tweets in the UK for 2019



Google Trends: Search queries past 30 days 2020 (UK)



An example of a twitter interactions network (Different colours represent communities within the overall network)



Preliminary findings

- Since the outbreak of African swine fever in early 2019, smallholders have raised concerns regarding animal welfare and have been seeking advice on Biosecurity methods
- Prevalence of many closed private groups within Facebook – Makes accessing information difficult
- Forums seem to provide greater levels of relevant information as they possess pig and poultry specific sub-forums
- A noticeable increase over the past few months relating to posted images of potentially diseased livestock

