VEO: how official statistics can help preventing emerging infectious diseases

Statistics Netherlands

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NTTS 2021

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- VEO: what is it?
- How can official statistics help, some examples:
  - Symptom based social media analysis
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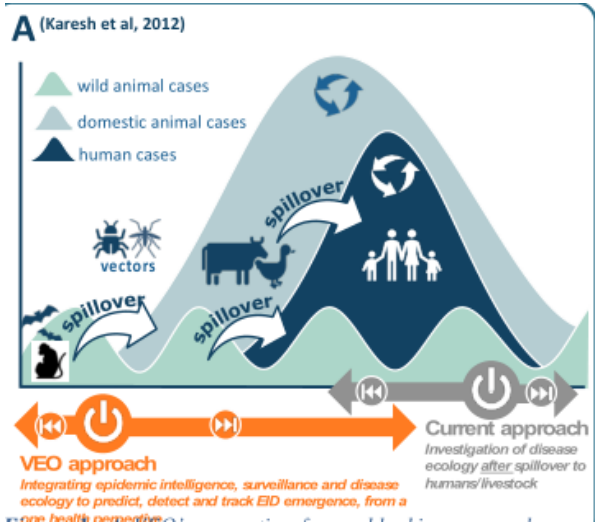
Versatile Emerging Infectious Diseases Observatory

- EU project, 20 partners
- Aim: ***Predict, signal and prevent infectious diseases***



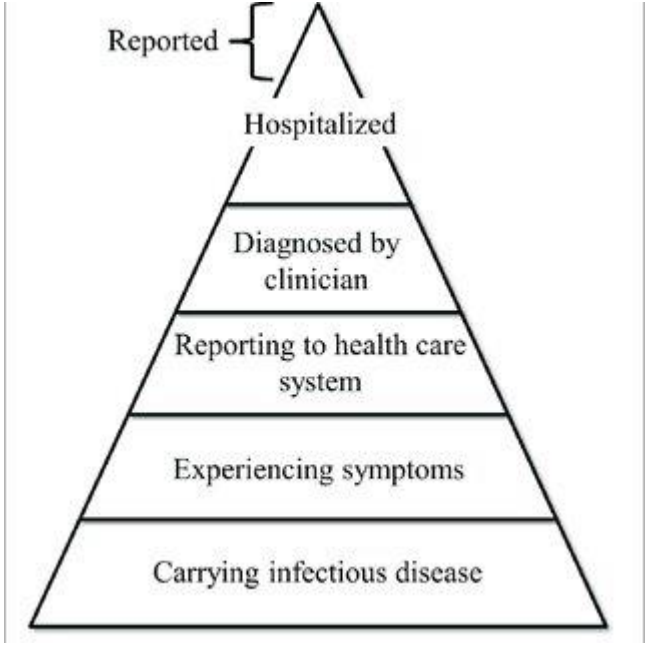
"***One health***": global health is strongly connected with human behaviour, animal health, climate and environmental issues.

Detecting Infectious Diseases

- In most cases, we detect infectious diseases late.
- Early warning systems need to be developed.

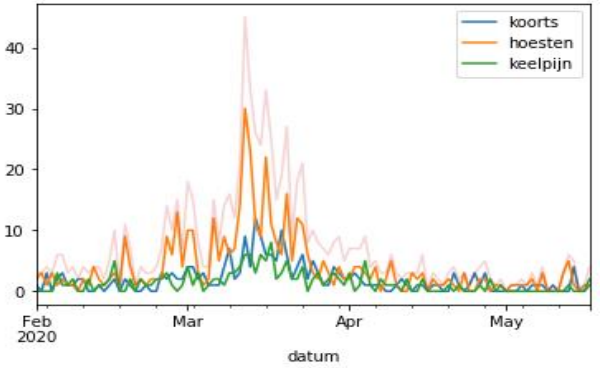
Data sources:

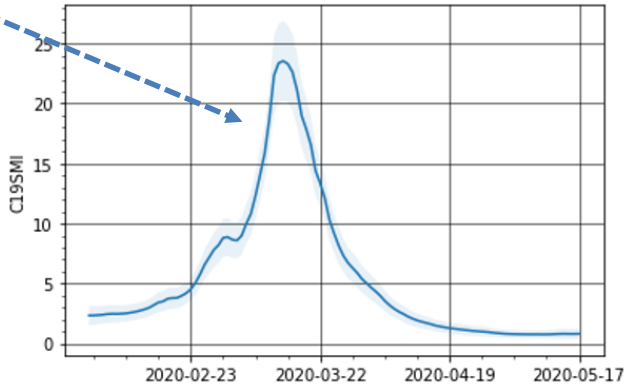
- Social media (twitter)
- Sewage data
- RNA sequences
- Mobility data
- Transaction data (scanner data)
- Register data (demographics)



Symptom based social media analysis

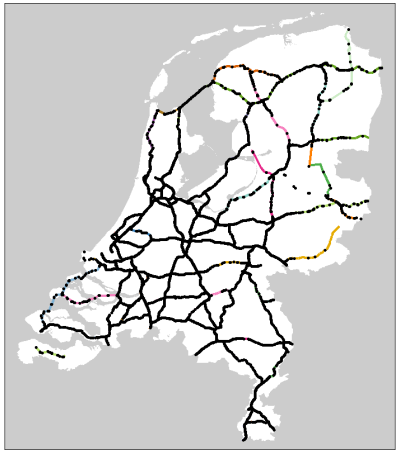
- Mentions of Covid-19 ***symptoms*** on Twitter: Soar throat, Cough, Fever
- Results were used for an experimental ***Covid-19 indicator***
- In VEO: collecting and processing ***multilingual*** twitter data for 4 countries on a centralized data science platform
- Adding ***more*** symptoms
- ***Comparing*** results among countries
- ***Generalize*** method for other IDs
- ***Dynamic populations*** on social media





Changes in mobility patterns

- NSI's have long term experience with safe handling of mobility data such as from:
  - traffic loops
  - mobile phones
  - public transport systems
- From register data and mobility data one can calculate the ***typical mobility*** week / weekend
- Streaming data may identify unexplainable local deviations because of an emerging infectious disease



Sewage samples and demography

- ***CDC's*** measure amount of ***virus RNA*** found in ***sewage***.
- Sewage network does *not* map to ***municipalities*** and visa versa.
- ***Dynamics*** in populations: People are mobile.

- Role of NSI's:
  - Combine several sources (e.g. mobility data)
  - Small Area Estimates

ELSI

- ELSI: ethical, legal and societal implications
- Bring in knowledge from official statistics practices
- Work areas :
  - Safely working on big data, medical data and bio data
  - Privacy preserving techniques (PPT)
  - Legal perspective in ***GDPR***
  - ELSI for collecting, sharing and using ***Citizen-Science data***
- Important goals:
  - Make inventory of ELSI barriers
  - Make roadmap: how to overcome barriers (e.g. privacy preserving techniques)

Wrap up

- Official statistics can help research on preventing infectious diseases
- Knowledge and experience on big data projects and experimental indicators
- Representativity and comparability of Health Data
- Several initiatives:
  - Symptom driven social media analysis
  - Detecting changes in local mobility
  - Statistical view on sewage analysis
- ELSI considerations

VEO Europe (veo-europe.eu)

This project has received funding from the *European Union's Horizon 2020 research and innovation programme* under grant agreement No 874735.