Background for Case Study Used in Workshop

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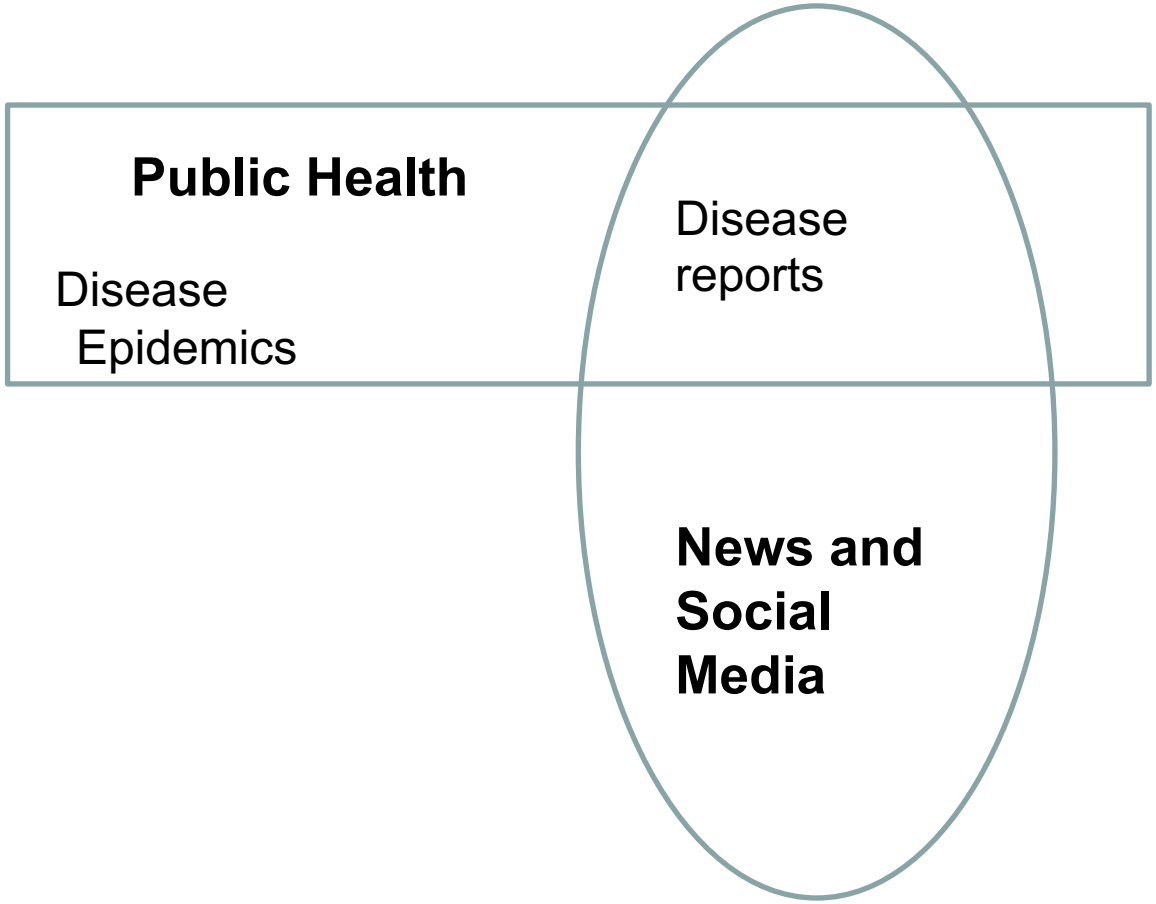
Preliminaries

- Purpose of lecture
  - Look at domain involved in case study
  - Look at different types of datasets that will be part of workshop
  - Understand purpose of project and learning outcomes

Domains involved



Basic Public Health Concepts

Basic concepts:

Disease

There are many classifications of diseases e.g. https://icd.who.int/

Outbreak

A new occurrence of a disease in a specific location

Epidemics

Large outbreaks of diseases e.g. SARS (severe acute respiratory syndrome) and Ebola

Unnatural epidemics

E.g. Bioterrorism

Disease report

Epidemiological information on cases and outbreaks of diseases

Detecting Epidemics

- Importance of detecting outbreaks/epidemics
  - The earlier epidemics are detected, the easier they are to control.
- EpiWatch
  - UNSW-based system
  - Designed by Integrated Systems for Epidemic Response (ISER), an NHMRC Centre for Research Excellence
  - Identifies outbreak alerts from publicly available data sources

Epiwatch data sources

- **WHO Website – Outbreaks News-**
  - http://www.who.int/emergencies/diseases/news/en/
- **ProMed-**
  - http://www.promedmail.org
- **CDC-**
  - https://www.cdc.gov/outbreaks/
- **Outbreak News Today-**
  - http://outbreaknewstoday.com
- **CIDRAP-**
  - http://www.cidrap.umn.edu
- **Global Incident Map-**
  - http://outbreaks.globalincidentmap.com
- **Flu tracker-**
  - https://flutrackers.com/forum/
- **H5N1 (Blog by Crawford Kilian)**
  - https://crofsblogs.typepad.com/h5n1/

Social media for tracking disease outbreaks – fad or way of the future?

October 12, 2016 11.03am AEDT Updated October 13, 2016 4.05pm AEDT

Timeliness is important for detecting epidemics. yochika photographer/

Email
Twitter 94

Social media has revolutionised how we communicate. In this series, we look at how it has changed the media, politics, health, education and the law.

Project characteristics

- Data sources give information about:
  - Type of disease
  - Location
  - Date
- Step1: developing APIs that:
  - Identifies disease reports from data sources
  - Should use standardised way to represent reports (JSON format provided)
- Step 2: developing applications
  - Analyse multiple disease reports
  - Possibly from different sources
  - Identify patterns that help detect outbreaks

Example of a disease report


```
{
  "url":"www.who.int/lalala",
  "date_of_publication":"2018-12-12 xx:xx:xx",
  "headline":"Outbreaks in Southern Vietnam",
  "main_text":"Three people infected by what is thought to be H5N1 or H7N9 in Ho Chi Minh city. First infection occurred on 1 Dec 2018, and latest is report on 10 December. Two in hospital, one has recovered. Furthermore, two people with fever and rash infected by an unknown disease.",
  "reports":[
    {
      "disease":[
        "influenza a/h5n1",
        "influenza a/h7n9"
      ],
      "syndrome":[
      ],
      "reported_events":[
        {
          "type":"recovered",
          "date":"2018-12-01 xx:xx:xx to 2018-12-10 xx:xx:xx",
          "location":{
            "geonames-id":1566083
          },
          "number-affected":1
        },
        {
          "type":"hospitalised",
          "date":"2018-12-01 xx:xx:xx to 2018-12-10 xx:xx:xx",
          "location":{
            "geonames-id":1566083
          },
          "number-affected":2
        }
      ],
      "Comment":null
    },
    {
      "disease":[
        "unknown"
      ],
      "syndrome":[
        "Acute fever and rash"
      ],
      "reported_events":[
        {
          "type":"infected",
          "date":"2018-12-01 xx:xx:xx to 2018-12-10 xx:xx:xx",
          "location":{
            "geonames-id":1566083
          },
          "number-affected":2
        }
      ],
      "comment":null
    }
  ]
}
```

Summary of Learning Outcomes

- Learning a new domain
  - Public health / epidemics / outbreak detection
  - News and social media data analysis
- Application development
  - Building a data analysis dashboard for health professionals
  - Incremental building (from API to application)
  - Exploiting publicly available data (teams free to use additional data sources)
- Software Development Skills
  - Business Analysis
  - API design and Implementation
  - Coding and Testing
  - Software Reuse