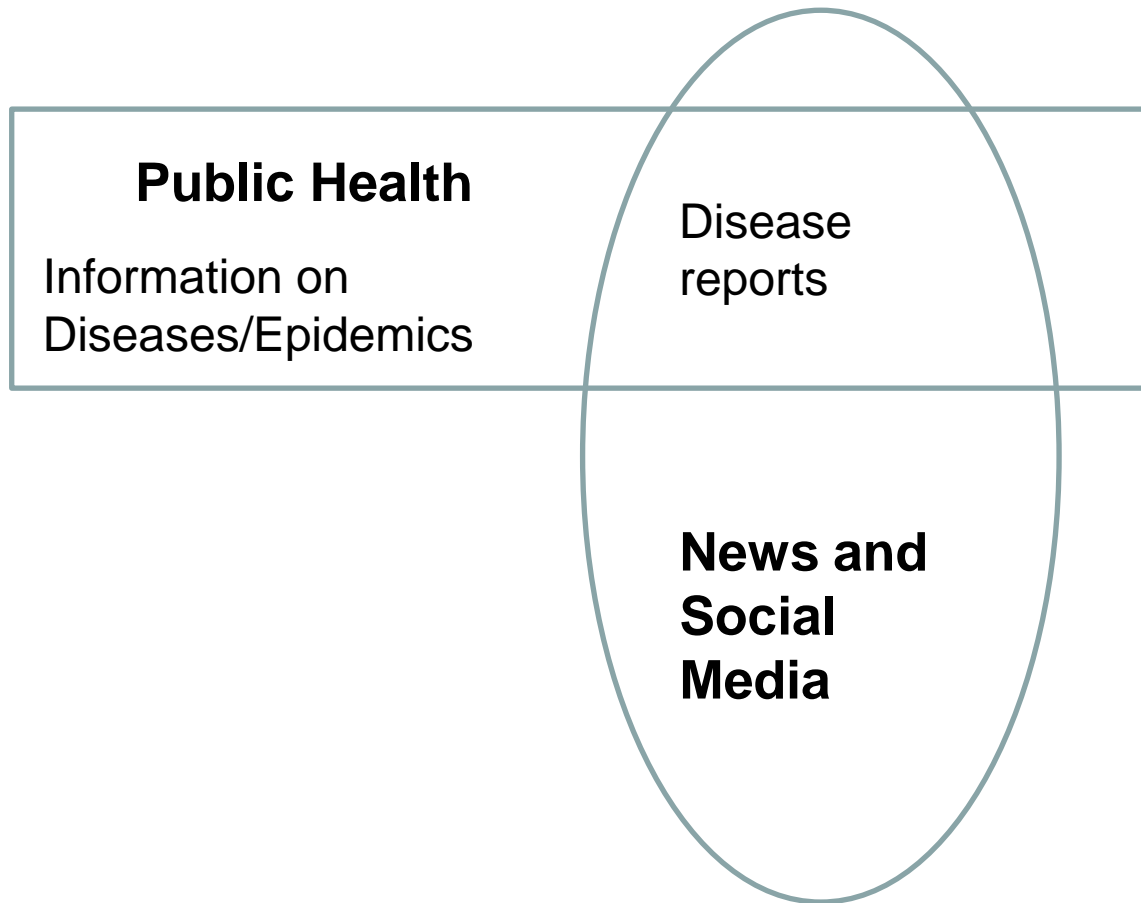# Background for Case Study Used in Workshop

Fethi Rabhi

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

Public Health

Information on
Diseases/Epidemics

Disease
reports

**News and
Social
Media**

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
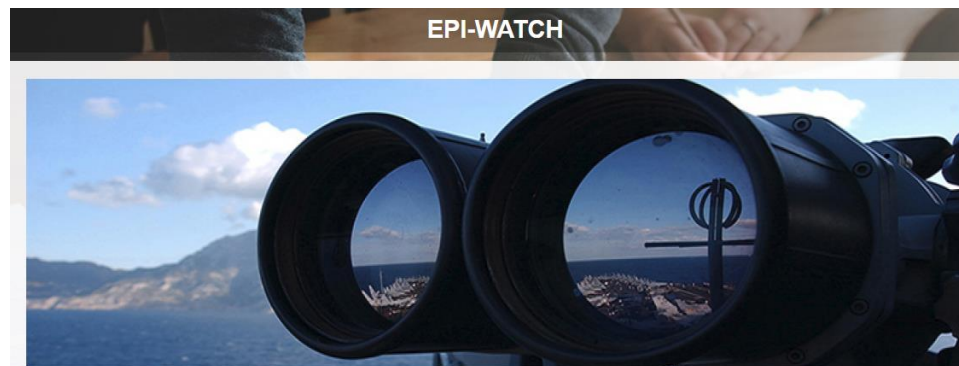
EPI-WATCH

Epi-watch is an observatory for outbreak scanning and rapid analysis. We provide more than a description of outbreaks. We analyse epidemic patterns, meet weekly and review current outbreaks in our team, and provide you with a summary of our critical analysis. Our team work daily on Epi-Watch and provide timely analyses.

Our team at Epiwatch can produce Watching Briefs on request for Australian government stakeholders and operational stakeholders such as the ministries of health of Pacific countries and other relevant non-government organisations involved in epidemic response. Requests from academics, other universities and industry will not be accepted.

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

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

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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": "https://www.who.int/csr/don/17-january-2020-novel-coronavirus-japan-ex-china/en/",
  "date_of_publication": "2020-01-17 xx:xx:xx",
  "headline": "Novel Coronavirus – Japan (ex-China)",
  "main_text": "On 15 January 2020, the Min
istry of Health, Labour and Welfare, Japan (MHLW) reported an imported case of laboratory-confirmed 2019-novel coronavirus
(2019-nCoV) from Wuhan, Hubei Province, China. The case-patient is male, between the age of 30-39 years, living in Japan.
The case-patient travelled to Wuhan, China in late December and developed fever on 3 January 2020 while staying in Wuhan.
He did not visit the Huanan Seafood Wholesale Market or any other live animal markets in Wuhan. He has indicated that he
was in close contact with a person with pneumonia. On 6 January, he traveled back to Japan and tested negative for influenza
when he visited a local clinic on the same day.",
  "reports": [
    {
      "event_date": "2020-01-03 xx:xx:xx to 2020-01-15",
      "locations": [
        {
          "country": "China",
          "location": "Wuhan, Hubei Province"
        },
        {
          "country": "Japan",
          "location": ""
        }
      ],
      "diseases": [
        "2019-nCoV"
      ],
      "syndromes": [
        "Fever of unknown Origin"
      ]
    }
  ]
}
```

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