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
Epiwatch data sources

• WHO Website – Outbreaks News-
• 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/

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

- Step 1: 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

```json
{
    "date_of_publication": "2020-01-17 xx:xx:xx",
    "headline": "Novel Coronavirus – Japan (ex-China)",
    "main_text": "On 15 January 2020, the Ministry 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