Scalable dashboard for visualizing data based on factors like time, region, and patient characteristics.

Developing a Dashboard to Profile and Visualize Patient Data with Infectious Diseases Using OMOP-CDM : A Case Study on Influenza in South Korea

Soobeen Seol[1], Byungjin Choi[2], Chungsoo Kim[1], Rae Woong Park[1,2]
[1]Department of Biomedical Sciences, Ajou University Graduate School of Medicine; [2]Department of Biomedical Informatics, Ajou University School of Medicine

Background

- Infectious diseases pose a global health threat, emphasizing the need for timely and accurate information. However, privacy concerns and data heterogeneity limit the sharing of valuable Electronic Health Records (EHRs) data.
- This study aimed to develop a dashboard using standardized data to profile and visualize patient data on infectious diseases, enabling comprehensive management and treatment.

Methods

1. Data source

- Ajou University School of Medicine database (AUSOM)
- Type: EHRs
- Period: 2018.01.01 ~ 2022.04.31

2. Data preparation

- Selected and extracted important information for patients with infectious diseases from standardized data
- Profiling of collected data for visualization dashboard, including demographics, diagnoses, lab tests, drugs and reports

3. Dashboard

'Cohort-level' support healthcare providers and public health officials in better understanding the overall characteristics of infectious diseases

Ex) clinical statistics, patient aggregation

'Individual-level' support healthcare providers make informed decisions about patient care

Ex) medical history, diagnosis, lab, drug, reports

4. Proof-of-concept study

Target cohort of patients with influenza, an acute febrile respiratory viral illness caused by influenza viruses

Results

Demo Video

- 4,920 patients with influenza were found in the AUSOM database.
- Patient gender distribution was relatively balanced, with males and females having a ratio of 48.7 to 51.3, respectively.
- Gyeonggi-do, the area where the hospital is located, accounted for the majority with 94% of all patients, followed by Chungcheongnam-do with only 0.5% (Figure 1).
- The patient's comprehensive medical information, including diagnosis, laboratory test results, and medications taken, was displayed on the individual-level page (Figures 2, 3).

Conclusions

- We created visual dashboards using standardized data converted to OMOP-CDM to show information about patients with infectious diseases.
- The dashboard is going to apply to data collected in near real-time(daily) converted to OMOP-CDM of clinical information from patients with infectious diseases for supporting healthcare providers in formulating treatment strategies for infectious diseases and making decisions quickly.

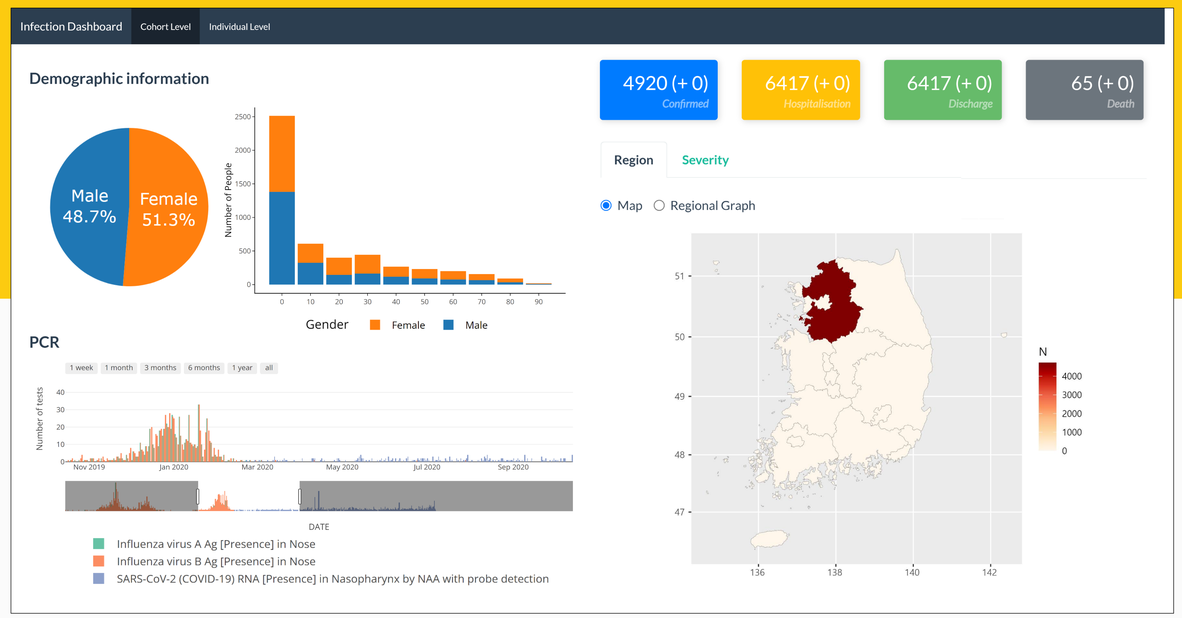

Figure 1. Screenshot of the cohort-level page. It shows clinical demographics, PCR testing trends, influenza confirmation status, national outbreaks, regional outbreaks as a percentage of total, and the number of patients by severity.

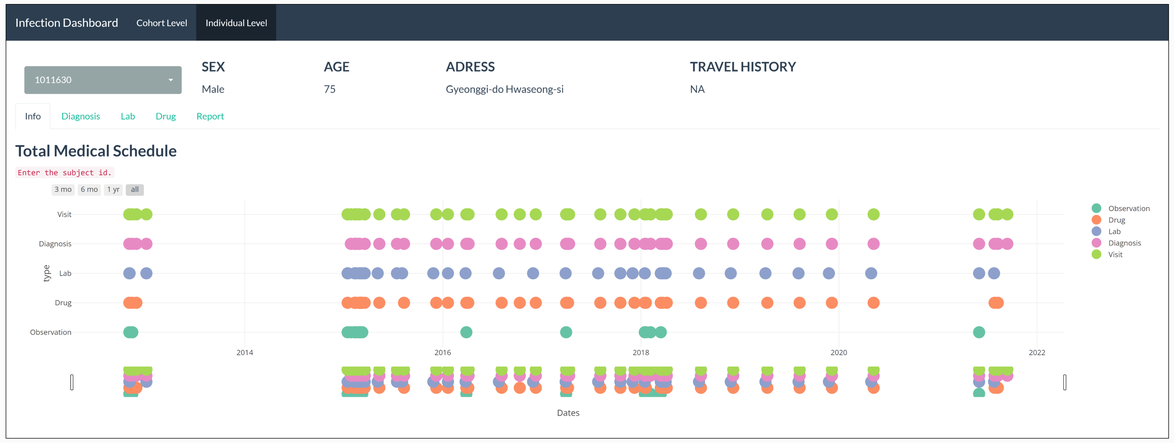

Figure 2. Screenshots of the individual-level page's info tab. Data for each patient with profiled data was shown. It provides quick access to information such as how frequently a patient sees the clinic, the kind of tests and treatments they typically receive, and more.

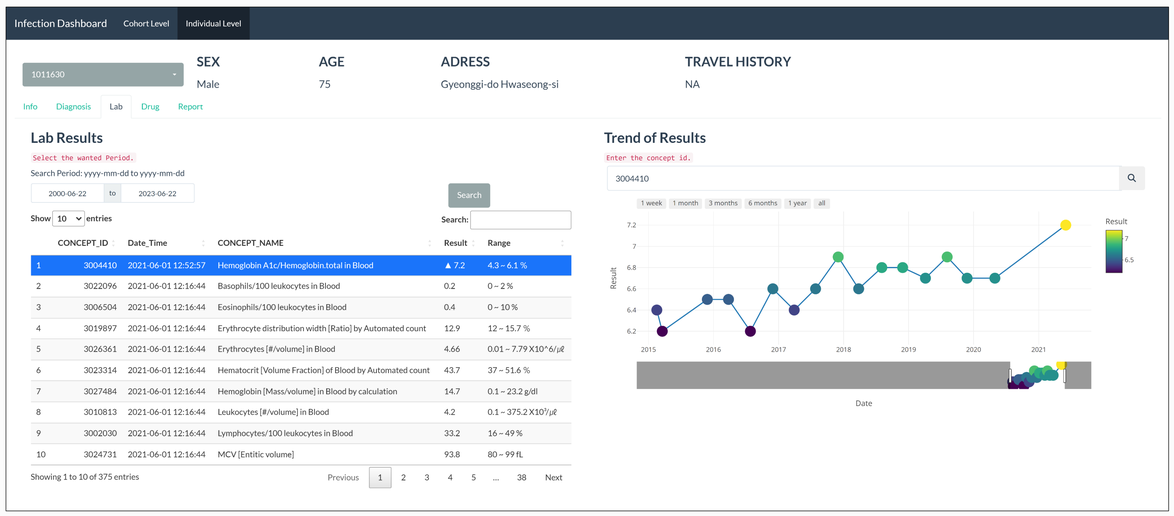

Figure 3. Screenshots of the individual-level page's lab tab. This shows each patient's lab test results, as well as trends for specific tests for each patient. Trend Graphs provide an intuitive way to understand lab test results, making it easy to identify outliers and compare lab test results from different periods to identify trends and patterns.

This research was funded a grant from the Korea Health Technology R&D Project through the Korea Health Industry Development Institute (KHIDI), funded by the Ministry of Health & Welfare, Republic of Korea (grant number: HR16C0001) and was supported by a Government-wide R&D Fund project for infectious disease research (GFID), Republic of Korea (grant number: HG22C0024).