

Interactive dashboard to monitor the COVID-19 outbreak

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Abstract

As of September 20th, 2021, 221 countries and territories are infected by the COVID-19 worldwide pandemic. Dashboards are the most often used visualization method for visualizing COVID-19 data and informing the public. The main objective of this study is to identify different features, visualization methods & improvements that should be occurred by exploring the existing dashboards and to develop a dashboard to visualize COVID-19 outbreak in Sri Lanka. We explored 15 different dashboards. The most commonly used visualization methods in dashboard development are bar charts, line charts, and interactive maps. Dashboards that fit on a single screen are preferable than others.

Keywords: Visualization, multiple time series, heatmap, COVID-19 vaccine, flexdashboard

Introduction

The COVID-19 pandemic is a global coronavirus illness outbreak that began in 2019 and is being caused by the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) virus. In December 2019, the first COVID-19-infected patient was discovered in Wuhan, China. According to Worldmeter data, there were 229835231 confirmed cases, 206515718 recovered cases, 18605877 active cases, and 4713636 deaths worldwide as of September 20, 2021. Currently, 99.5 percent of active patients are in a mild state, while 0.5 percent are in a critical state.

Dashboards are one of the greatest visual interpretation methods for tracking the COVID-19 pandemic's spread and communication. There are a plethora of COVID-19 visualization dashboards that have been designed to visualize the pandemic's global and local status. Different software can be used to generate dashboards. We explored 15 dashboards designed to visualize COVID-19 data in the global and country levels. First, dashboards were compared to identify the various features, visualization approaches, and enhancements that should be implemented. Next, we developed an interactive dashboard to visualize COVID-19 outbreak in Sri Lanka.

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Literature Review

Initially 15 dashboards were compared to determine which data types are most frequently shown in dashboards. The 15 dashboards we used in the study are listed below (Table 1).

Table 01: Labeled of the Dashboards

| No | Name of the Dashboard | Reference |
|----|---|--|
| 1 | COVID-19 dashboard created by the John Hopkins University Center for Systems Science & Engineering (JHU CSSE) | |
| 2 | WHO COVID-19 Dashboard | |
| 3 | COVID-19 surveillance dashboard created by the University of Virginia | |
| 4 | Corona cases (COVID-19) per municipality in Belgium dashboard | “COVID 19 Dashboard – Belgium” (2022) |
| 5 | COVID-19 dashboard for England created by NHS providers | “COVID 19 Dashboard – NHS providers” (2022) |
| 6 | NZ COVID-19 Dashboard | |
| 7 | Pakistan’s official COVID-19 dashboard | |
| 8 | COVID-19 Canada live dashboard | |
| 9 | India (COVID-19) Dashboard | “COVID 19 Dashboard India – ZOHO Analytics – ZOHO” (2022) |
| 10 | Italy COVID-19 dashboard | “COVID-19 integrated surveillance data in Italy – EpiCentro” (2022) |
| 11 | Jamaica COVID-19 Dashboard | |
| 12 | GCI COVID-19 dashboard for Russia | |
| 13 | COVID-19 live situation analysis dashboard of Sri Lanka | “COVID-19: Live situational Analysis Dashboard of Sri Lanka,” (2022) |
| 14 | COVID 19 ZA South Africa Dashboard | |
| 15 | COVID-19 dashboard for Germany | |

Methodology

Results

The “Sri Lanka COVID-19 Dashboard” provides an overview of the COVID-19 pandemic for Sri Lanka. This dashboard has eight panels as follows.

Table 01: Description of the panels

| Name of the Panel | Description of the Panel |
|--------------------------------|--|
| Overview | Total count of COVID-19 confirmed, recovered, deaths, active cases & total vaccine doses administered. Provide an overview of daily COVID-19 confirmed, recovered & deaths by plots. |
| Cases by Wave | There are three tabs in this panel. * Total COVID-19 confirmed cases - Cumulative count of COVID-19 confirmed cases with specific dates * COVID-19 Cases Distribution by Wave - Daily confirmed cases by wave * COVID-19 Deaths Distribution by Wave - Daily deaths by wave |
| COVID-19 Patients Distribution | Provide an overview of confirmed cases district wise distribution. There are four tabs in this panel. * Total COVID-19 Patients Distribution in Sri Lanka - Total confirmed counts for each district is represented by tree map * Country Map - Total confirmed cases in each district represented by Sri Lanka country map * Distribution of Daily COVID-19 Patients for Last 30 Days - Visualize the daily confirmed cases distribution by districts in last 30 days * By Applying Min-Max Transformation - Visualize the details in the third tab by applying min-max transformation for each district |
| Vaccination Details | Provide an overview of COVID-19 vaccination in Sri Lanka. There are two tabs. * Total Vaccine Doses - Visualize the administered vaccine doses as first dose only & fully vaccinated * Total Administered Doses by Vaccine Name - Visualize the vaccination by vaccine names |
| Top 10 Countries | In this panel, compare the Sri Lanka confirmed & deaths with top 10 countries in the world (top 10 countries - The countries which have been reported highest number of confirmed cases as 31st of August 2021). There are two tabs. * Comparison of Cumulative Cases in Sri Lanka with Top 10 Countries - Compare the confirmed and deaths in Sri Lanka with top 10 countries by cumulative time series plots * Comparison of Log of Cumulative Cases in Sri Lanka with Top 10 Countries - Compare the confirmed and deaths in Sri Lanka with top 10 countries by log cumulative time series plots (The data has been pulled from WHO) |
| Global Comparison | Compare the total confirmed & deaths in Sri Lanka with top 10 countries in Global & Asia. There are two tabs. * Comparison of the Sri Lanka with Top 10 Countries Reporting the Most COVID-19 Cases in the World - Compare the total confirmed & deaths in Sri Lanka with top 10 countries in the world & compare the case fatality ratios * Comparison of the Sri Lanka with Top 10 Countries Reporting the Most COVID-19 Cases in the Asia - Compare the total confirmed & deaths in Sri Lanka with top 10 countries in the Asia & compare the case fatality ratios |

| Name of the Panel | Description of the Panel |
|-------------------|--|
| Global Map | Visualize the distribution of confirmed, recovered & deaths in the world by world map. |
| About | This panel contains the details about the dashboard. |

Discussion and Further research

References

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