

# A REPORTING and COMPARING APPLICATION FOR PROVINCE BASED COVID-19 CASES IN TURKEY WITH R SHINY



Ph.D. Cenk İÇÖZ  
Eskişehir Technical University  
Department of Statistics  
Eskişehir, Turkey



24-26 Nov 2021

# Motivation



- Insufficient covid data sharing for comparison of province based weekly cases. (only weekly cases)
- No database for all weekly data (officially!!!)
- Therefore, missing reporting of comparisons time-wise and spatio-temporal wise in the official site.  
<https://covid19.saglik.gov.tr/>
- Let's build an app. for use of everyone (esp. people without coding knowledge )
- Observing the effects of normalization procedure in Turkey.
- Boredom from quarantine 😊

# Covid -19 Pandemic in Turkey



- Partial lockdown applications
- Mask, social distancing, hygiene
- Online Education ( primary schools to universities )
- Provincial Risk based normalization procedures: Late Feb 2021
- 14th April partial lockdown
- 29th April to 17th May full lockdown: Education suspended all exams postponed.

# Covid -19 Visualizations



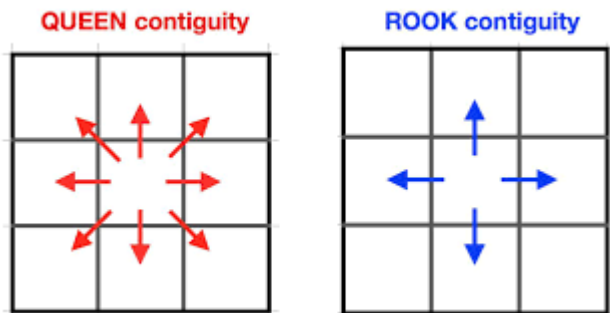
- Thematic Maps (Spatial dimension)
- Line Graphs (Time series graphs)
- Bar Graphs
- Interactive Graphs
- Dashboards
- Shiny Applications [1,2]

# Covid -19 Visualizations



Why spatial neighbors?

- Circulation between cities
- Similar weather properties
- Similar socio-economic properties

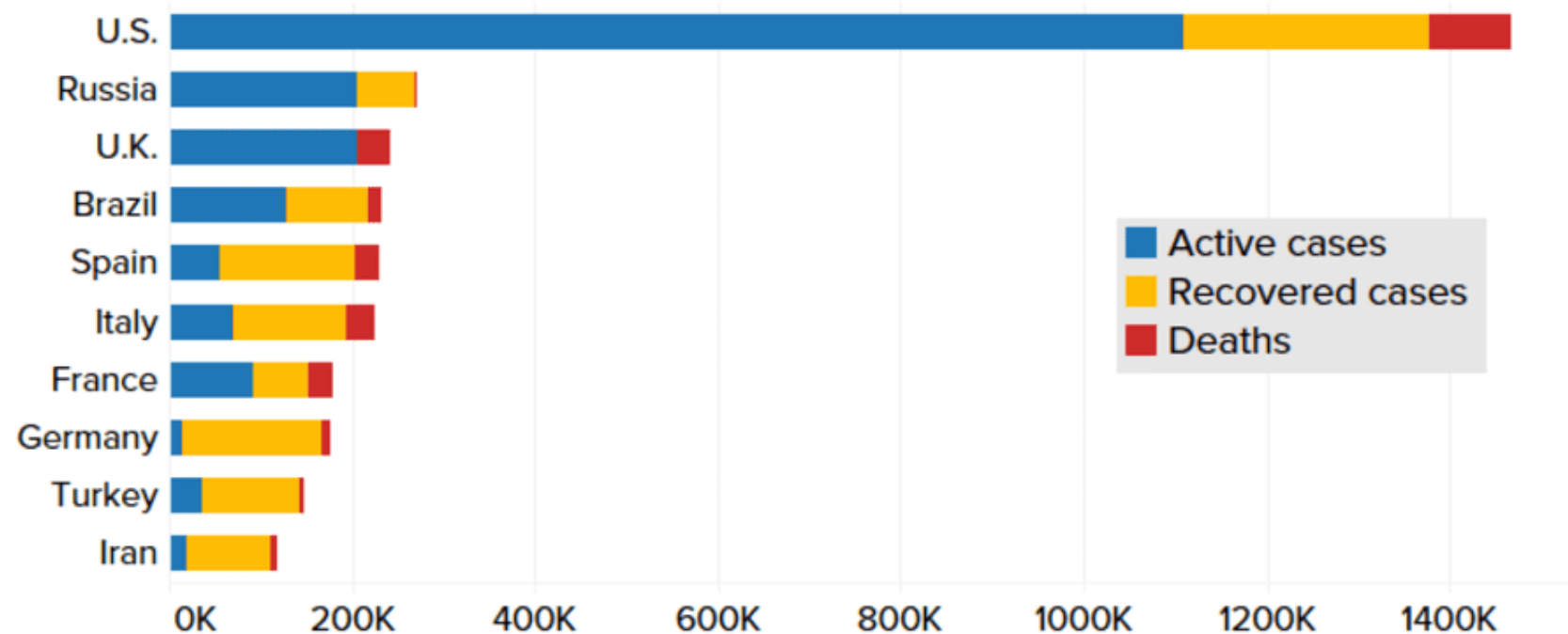


# Covid -19 Visualizations



## Countries with the most reported coronavirus cases

Data as of May 17, 2020 at 9:03 a.m. Beijing time



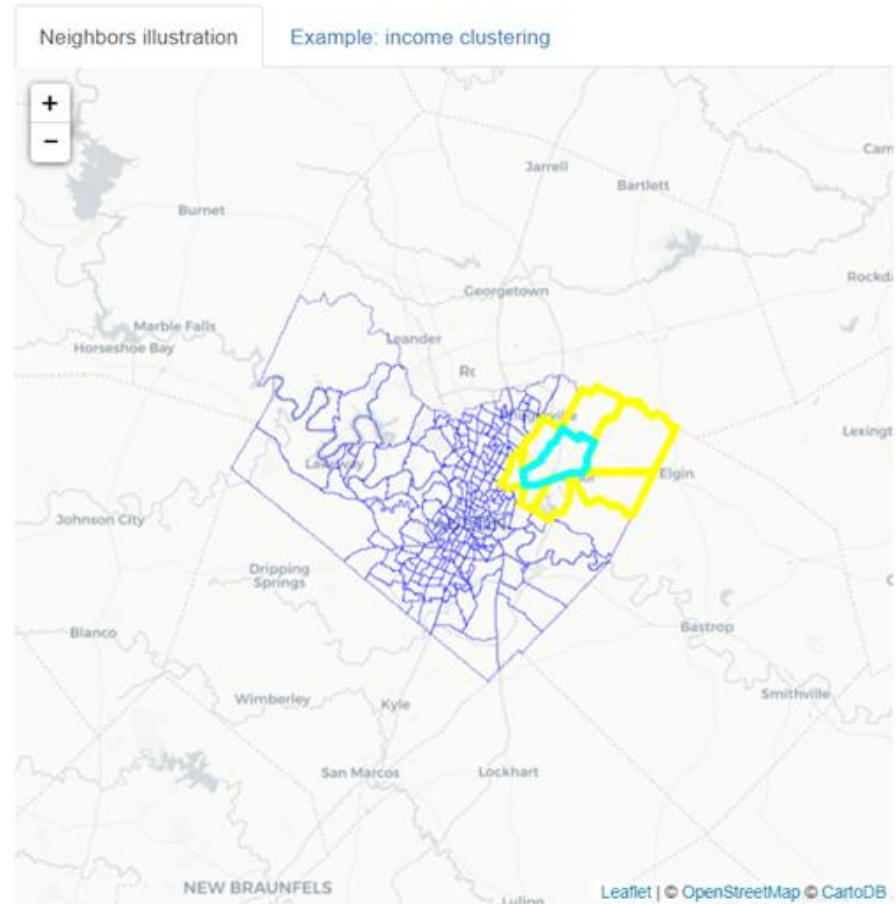
SOURCE: Johns Hopkins University



# Application and Dashboard Ex.



- Select a neighborhood type:
- Queen's case contiguity
  - Rook's case contiguity
  - K-nearest neighbors
  - Distance



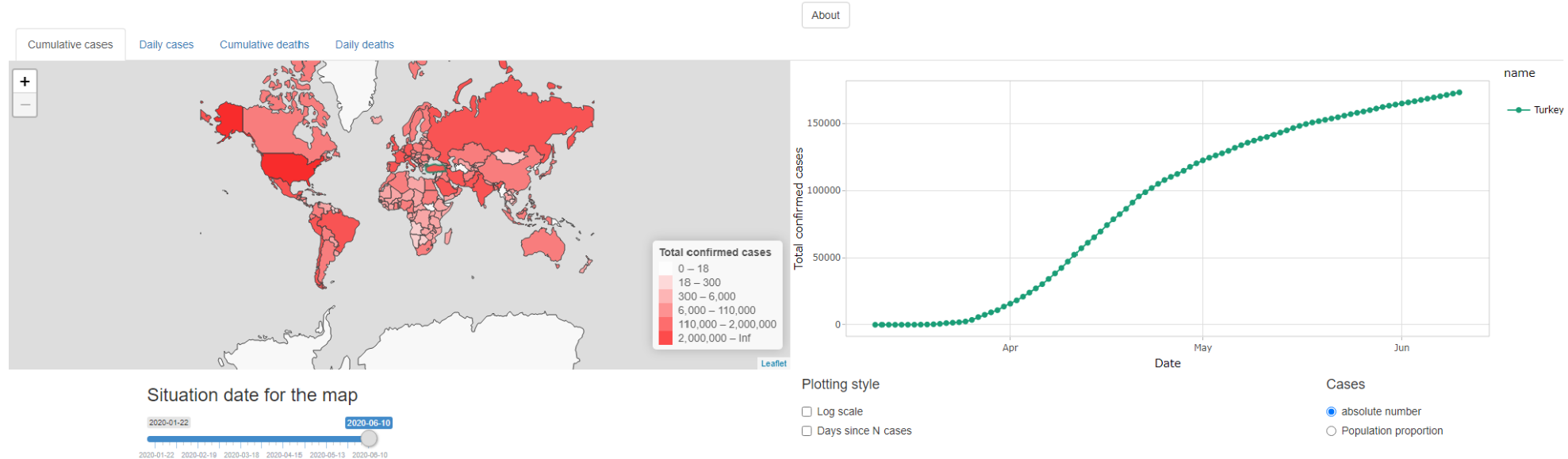
[3]

# Application and Dashboard Ex.



## Covid-19: country comparison

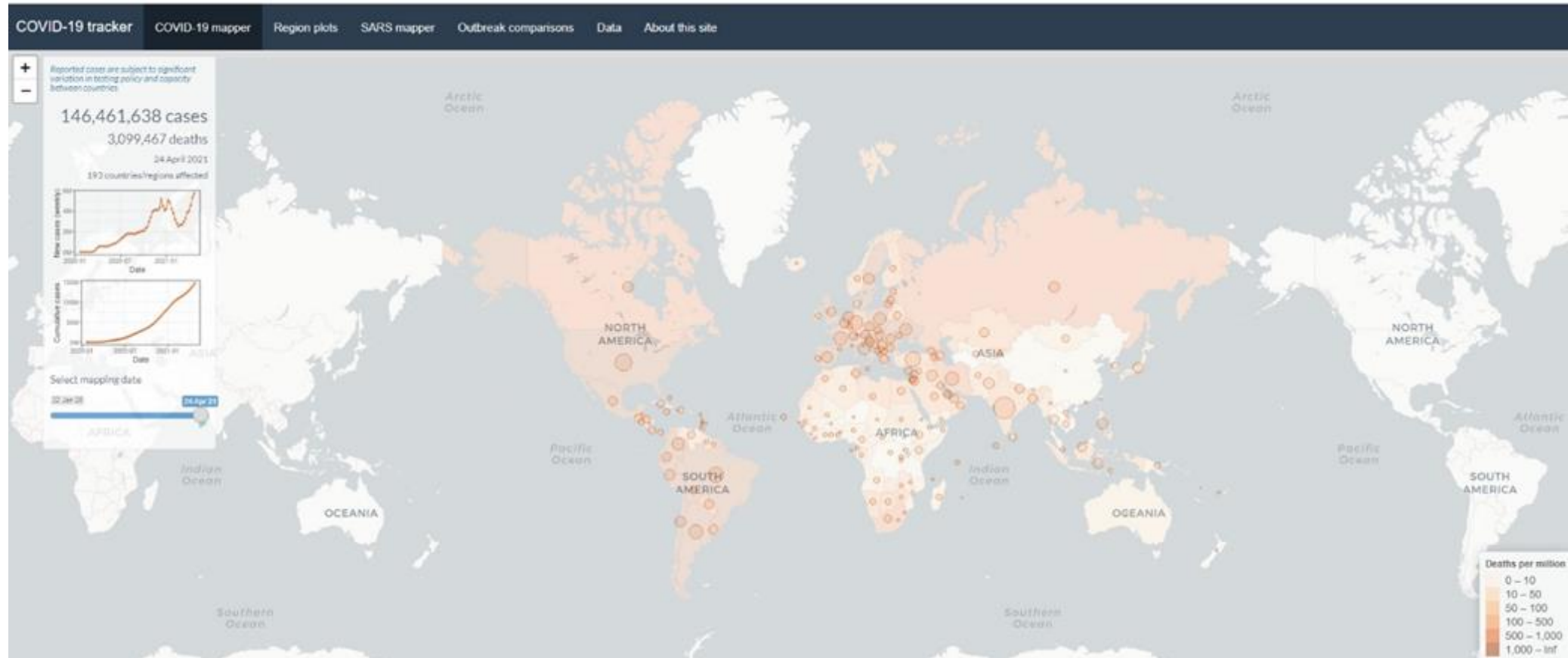
Click country on the map to select or deselect. Plotting options below. More in 'about'. Designed by Denis Mongin



Covid-19 Country Comparison.  
<https://scitilab.shinyapps.io/Covid19/>



# Application and Dashboard Ex.



Covid -19 Tracker.

<https://shiny.rstudio.com/gallery/covid19-tracker.html>

# Application and Dashboard Ex.



**GOV.UK** Coronavirus (COVID-19) in the UK

Last updated on Wednesday, 3 November 2021 at 4:15pm

### Daily update UK Summary

The official UK government website for data and insights on coronavirus (COVID-19). See the [simple summary](#) for the UK.

#### Vaccinations

##### People vaccinated

Up to and including 2 November 2021

Daily – first dose	46,663	Daily – second dose	20,922	Daily – booster or third dose	296,670
Total – first dose	50,071,683	Total – second dose	45,752,487	Total – booster or third dose	8,652,842

[All vaccinations data](#)

#### Percentage of population aged 12+

First dose	87.1%
Second dose	79.6%
Booster or third dose	15%

#### Cases

##### People tested positive

Latest data provided on 3 November 2021

Daily: 41,299  
Last 7 days: 277,837 (-29,879 (-9.7%))  
Rate per 100,000 people: 416.2

#### Deaths

##### Deaths within 28 days of positive test

Latest data provided on 3 November 2021

Daily: 217  
Last 7 days: 1,141 (+131 (13%))  
Rate per 100,000 people: 1.5

#### Healthcare

##### Patients admitted

Latest data provided on 30 October 2021

Daily: 888  
Last 7 days: 7,213 (+162 (2.3%))

#### Testing

##### Virus tests conducted

Latest data provided on 2 November 2021

Daily: 868,999  
Last 7 days: 6,043,973 (-97,297 (-1.6%))

### What's the situation in your local area?

#### Search by postcode

View data for your local area

Enter a postcode  
For example SW1A 0AA

Find a postcode on [Royal Mail's postcode finder](#)

#### UK interactive maps

Explore maps for:

- cases
- vaccinations

Daily summary: Coranavirus in the UK.  
<https://coronavirus.data.gov.uk/>

# Shiny Application



## ■ Used Packages

- tmap
- shiny
- sp
- spdep (for investigating neighbor based case trends)
- ggplot2
- plotly

# Shiny Application



- Parts of the app. ( tabs )

- 1) Introduction
- 2) Province Based Risk Classification Comparison for Two weeks' Cases
- 3) Increase-decrease Status and Increase-Decrease Percentages
- 4) Province and it's Neighbours Weekly Trends

# Shiny Application



**Load CSV File**

Browse... No file selected

Header

Select week:

Select province:

Eskişehir

Introduction | Province Based Risk Classification Comparison for Two weeks' Cases | Increase-decrease Status and Increase-Decrease Percentages

Province and its Neighbours Weekly Trends

## Province based Covid-19 Case Comparison and Reporting Application

This application is designed to compare and report the number of covid cases per hundred thousand on a weekly basis in Turkey. Class limits were taken as 0,20,50,100 in order to draw the thematic map. The weekly case numbers were taken from the website of the Ministry of Health of the Republic of Turkey. [Covid Data](#)

The application allows the user to upload their own data as a CSV file and compare it with the number of other weeks registered in the system. the file upload must be done in a comma-delimited file type to **Load CSV File** section including the header. When the file is not uploaded, only the 4 weeks in the system can be compared.

For the 1st and 2nd graphics, the relevant tabs must be selected and the entry must be selected from the **Select week** section. Entries can be deleted and changed with the backspace key. Since the differences between the two weeks will be compared, two weeks should be selected in the creation of the graphics in the 1st and 2nd tabs.

In the last tab, the trends will be compared on the basis of the selected province and its neighbors. For this, both the **Select province** and **Select week** entries must be selected. More than two weeks can be selected for the graph in this tab.

# Shiny Application



**Load CSV File**

Browse... No file selected

Header

**Select week:**

27 February - 5 march 1 May - 7 may

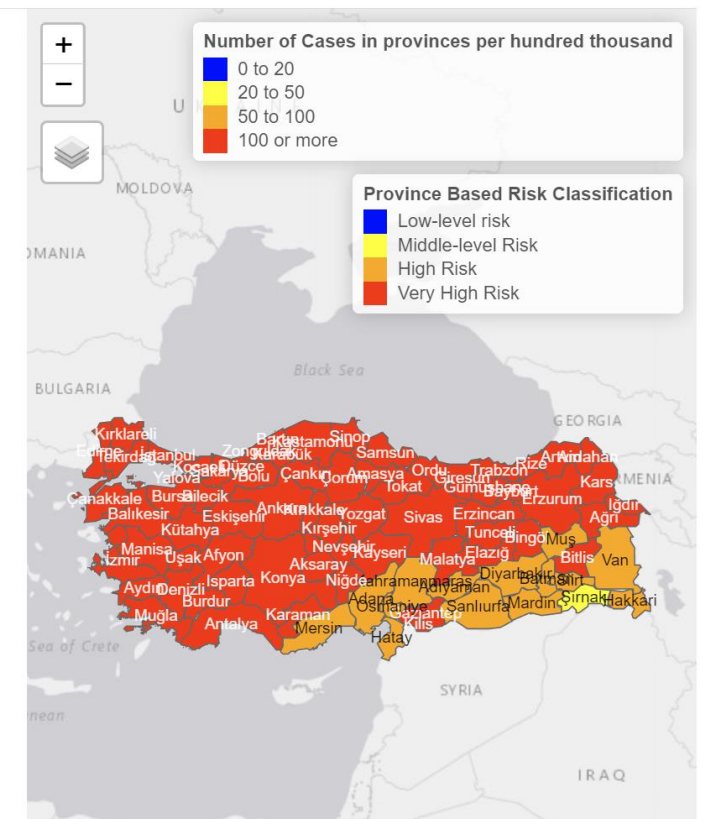
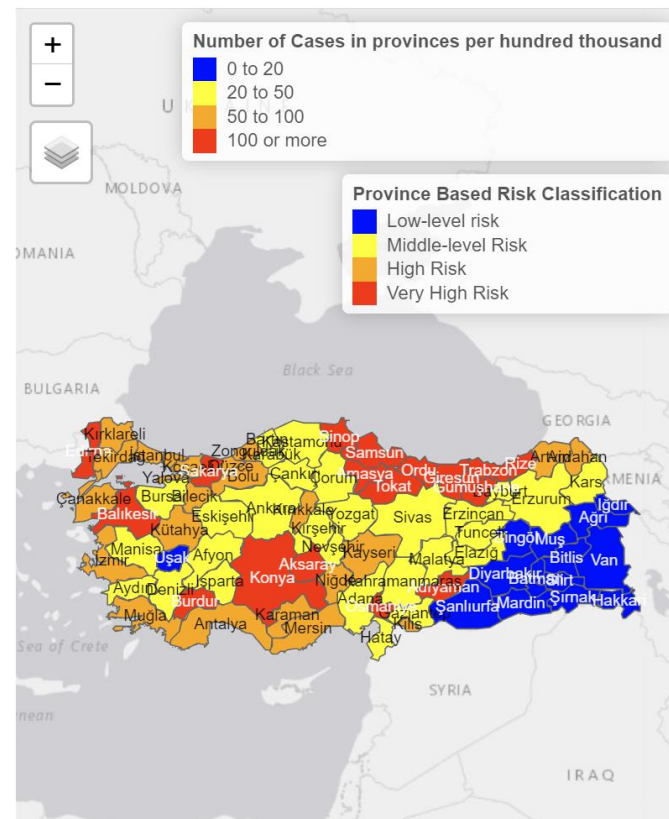
**Select province:**

Eskişehir

Introduction Province Based Risk Classification Comparison for Two weeks' Cases

Increase-decrease Status and Increase-Decrease Percentages

Province and it's Neighbours Weekly Trends



# Shiny Application



**Load CSV File**

Browse... No file selected

Header

**Select week:**

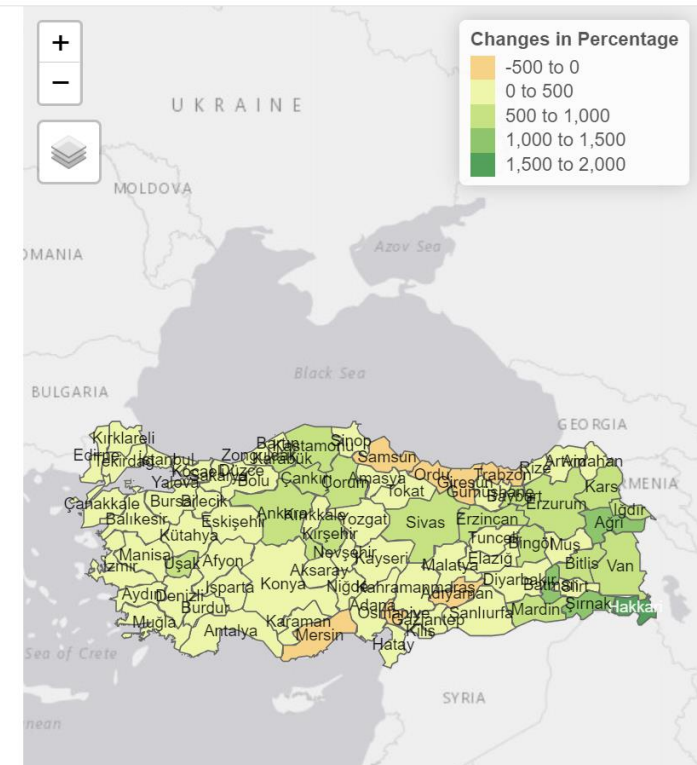
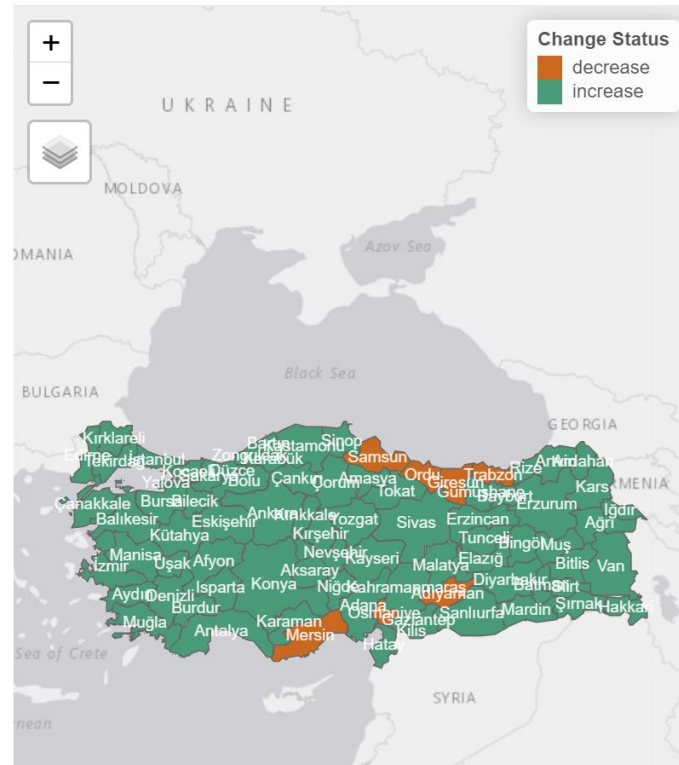
27 February - 5 march 1 May - 7 may

**Select province:**

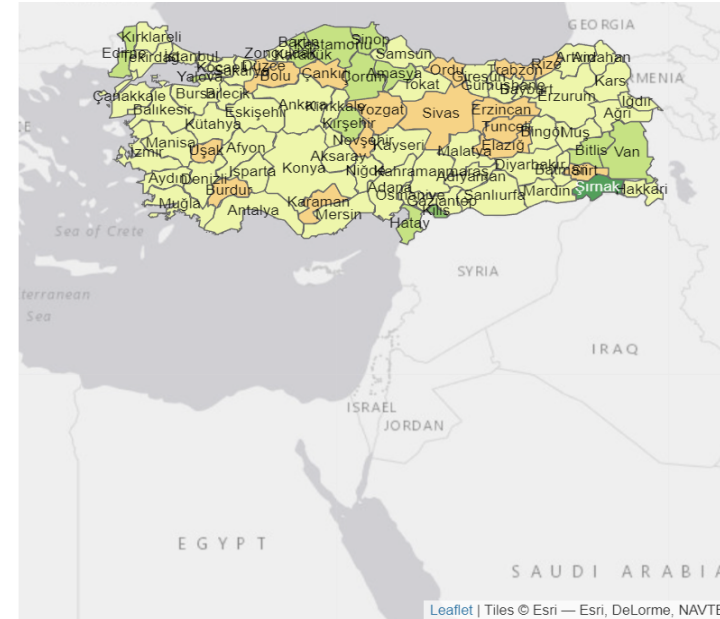
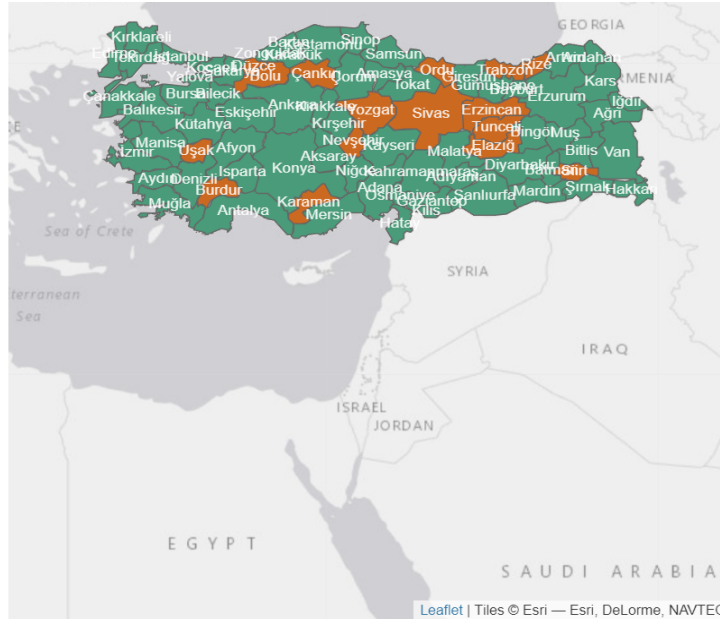
Eskişehir

Introduction Province Based Risk Classification Comparison for Two weeks' Cases Increase-decrease Status and Increase-Decrease Percentages

Province and it's Neighbours Weekly Trends



# Shiny Application



According to compared weeks in **Adana** province **29.11 percent** increase has occurred .  
According to compared weeks in **Adiyaman** province **21.24 percent** increase has occurred .  
According to compared weeks in **Afyon** province **23.91 percent** increase has occurred .  
According to compared weeks in **Ağrı** province **28.79 percent** increase has occurred .  
According to compared weeks in **Aksaray** province **14.47 percent** increase has occurred .  
According to compared weeks in **Amasya** province **66.43 percent** increase has occurred .  
According to compared weeks in **Ankara** province **37.63 percent** increase has occurred .  
According to compared weeks in **Antalya** province **5.04 percent** increase has occurred .  
According to compared weeks in **Artvin** province **21.14 percent** increase has occurred .  
According to compared weeks in **Artvin** province **23.09 percent** increase has occurred .  
According to compared weeks in **Aydın** province **17 percent** increase has occurred .  
According to compared weeks in **Balıkesir** province **20.97 percent** increase has occurred .  
According to compared weeks in **Bartın** province **77.65 percent** increase has occurred .



# Shiny Application



Load CSV File

Browse... No file selected

Header

Select week:

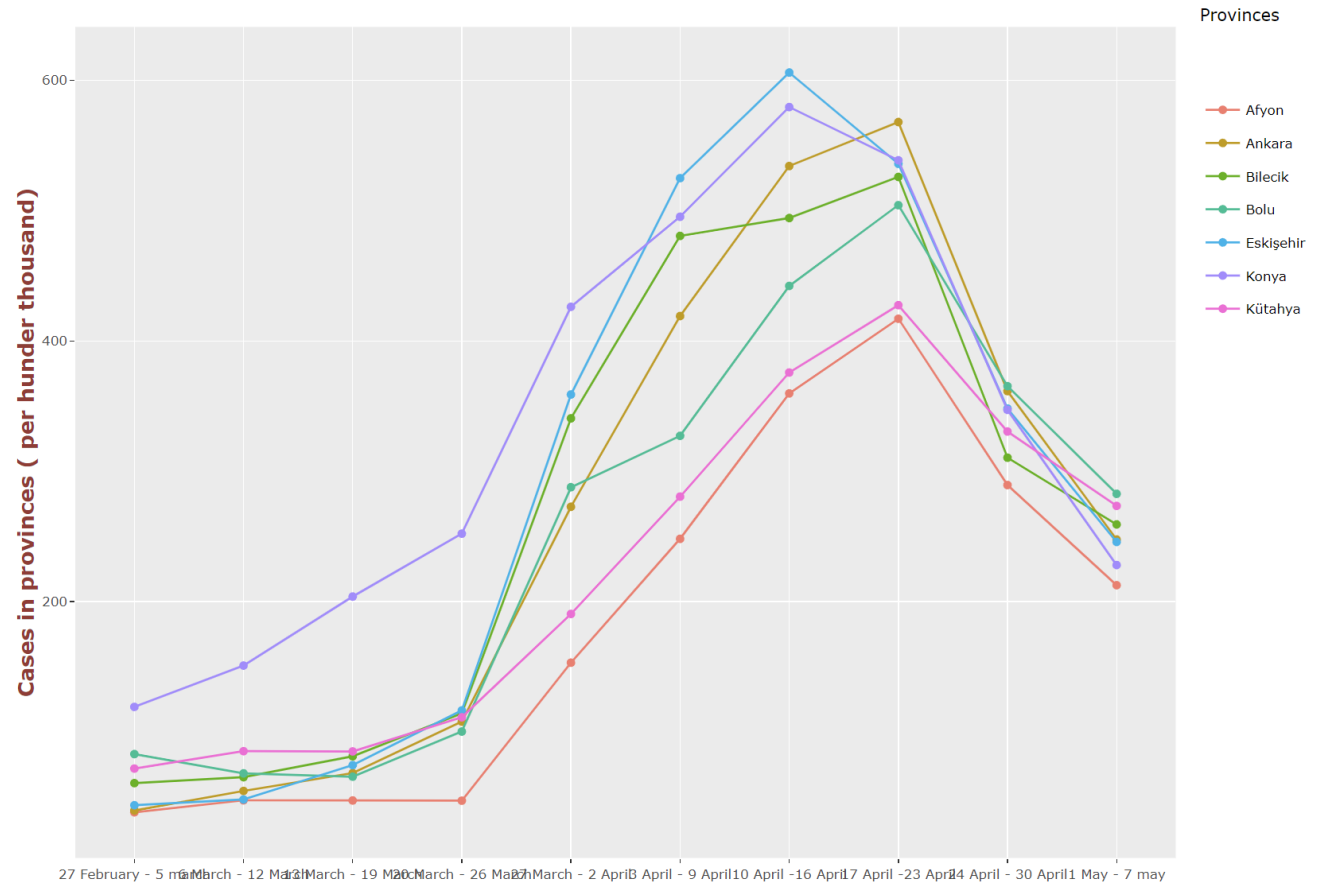
27 February - 5 March 6 March - 12 March 13 March - 19 March  
20 March - 26 March 27 March - 2 April 3 April - 9 April 10 April - 16 April  
17 April - 23 April 24 April - 30 April 1 May - 7 May

Select province:

Eskişehir

Introduction Province Based Risk Classification Comparison for Two weeks' Cases Increase-decrease Status and Increase-Decease Percentages

Province and it's Neighbours Weekly Trends



# Improvements



- Multilanguage app. Design
- Web scraping?
- Data table
- Selection of provinces by users.
- Multiple thematic maps ( Ex: 4 weeks at most)
  - Risk based
  - Choropleth map

# References



- [1] Towards Data Science: “Top 100 R resources on Novel COVID-19 Coronavirus”. <https://towardsdatascience.com/top-5-r-resources-on-covid-19-coronavirus-1d4c8df6d85f>
- [2] Covid 19-r. <https://mine-cetinkaya-rundel.github.io/covid19-r/> (05.05.2021).
- [3] Spatial neighbors in R - an interactive illustration. <http://personal.tcu.edu/kylewalker/spatial-neighbors-in-r.html> (05.05.2021).
- [4] <https://covid19.saglik.gov.tr/>
- [5] <https://dergipark.org.tr/en/pub/veri/issue/64538/934799>

# Thank you. Questions?

Contact: [cicoz@eskisehir.edu.tr](mailto:cicoz@eskisehir.edu.tr)

Github:

<https://github.com/cenkicoz26/covid>

Shiny App Turkish Version:

[https://cenkicoz.shinyapps.io/covidshiny/?\\_ga=2.108085440.338756453.1619906678-857120237.1618862014](https://cenkicoz.shinyapps.io/covidshiny/?_ga=2.108085440.338756453.1619906678-857120237.1618862014)