Assignment 01

Covid-19 dashboard

TEAM IMPERATORS

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Content

Methodology

Data collection

Our main data source was our world data set about covid-19. we filter subpart of that data set which relevant to Sri Lanka. we use the arbitrary imputation method to fill na values before the first case recorded. there are also irregularities in this data may be because some records didn't release daily basis. in that scenario, we use the forward filling imputation method. we used government daily records reports in pdf format to get data about how cases distribute through districts and hospital data. we use some local and international media reports to get more data on lockdowns and travel restrictions. To get vaccination data we use several methods which are location-based vaccine type data and in Sri Lanka daily update report about vaccination progress and for virus variant data we get from several lab reports and CDC variant analysis report.

What are we trying to do?

we mainly try to find how lockdowns effect to spread of the virus and how pandemic affect the community in education and the economy also how we can accomplish fully vaccination. then we compare the Sri Lankan situation with the region and all over the world. we drill down the local situation into districts and clusters.

note:

Sometimes country officials change reporting to include or exclude a certain category of infections or deaths, which can lead to a significant increase or decrease in total and what they reported previously. especially in district data.

Tools

Our main technology was a python and its native packages for this project. For data wrangling, we use the url3lib package and beautiful soup packages with them we scrapped several websites to get the information they provide and also we get data from API to provide by HPB Srilanka. We use NumPy and pandas and also a feature engine for data cleaning and preprocessing. We used the basic analysis in the Jupiter environment and used pycharm IDE. for visualization, we used plotly dash for the dashboard and plotly graphic object library and express library for creating graphs. Them also python libraries. Then we create our dash app as separate modules which are global and local after complete creating them we integrate both modules into one flask server and deploy them into Heroku to easily experience our dashboard without installing anything into user machines.

This is our analysis repository - https://github.com/ashen007/SL_COVID_analysis

This is our dashboard repository - https://github.com/ashen007/sl-covid-dashboard

This is our dashboard link - https://sl-covid19-dashboard.herokuapp.com/
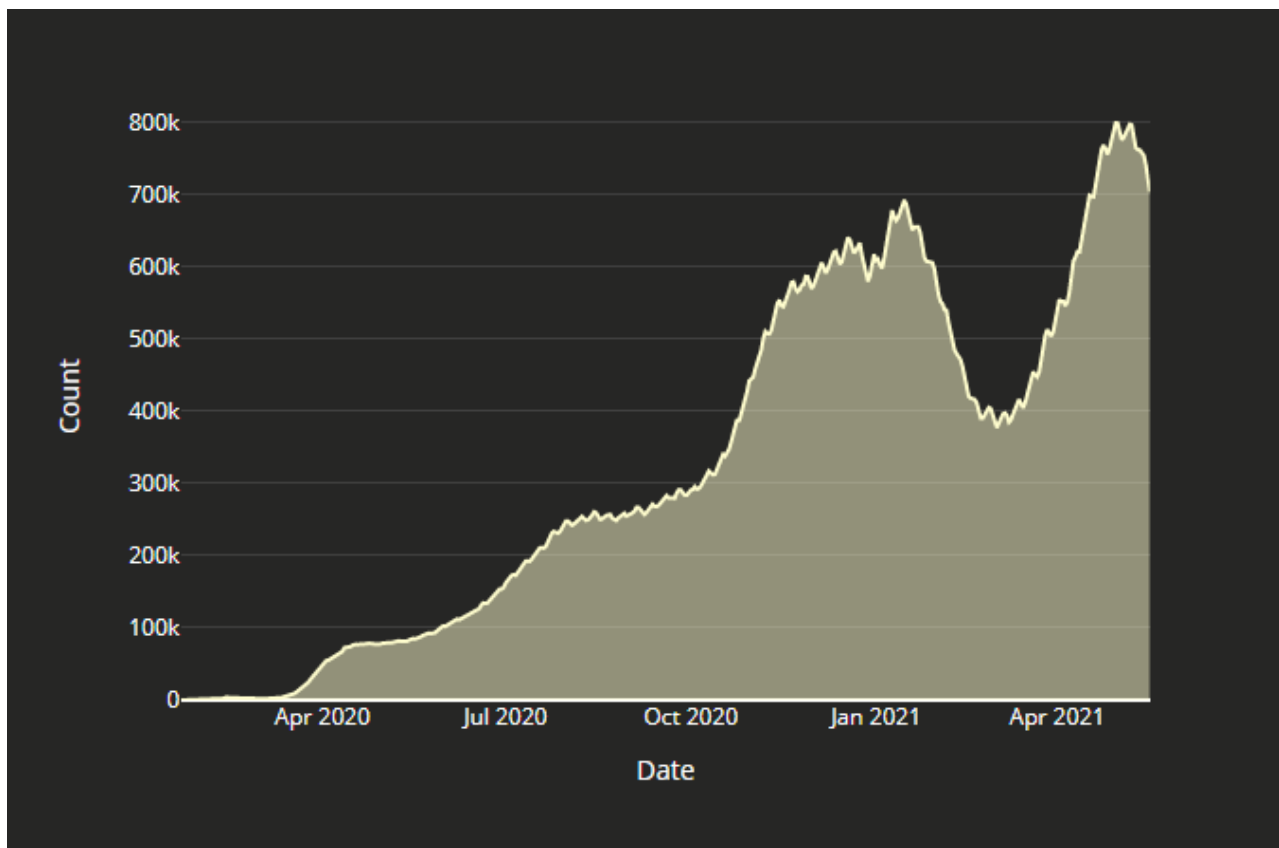
Presentation - https://youtu.be/Z2HNRf3BAYs

Global context

Reported cases

The current 7-day rolling average is 539662. Compared to last week's rolling average of 677080 it's decreased by 20.3% and the highest daily reported cases recorded 905992 are now 59.6% far from that peak.

Figure 3.1 - reported daily cases

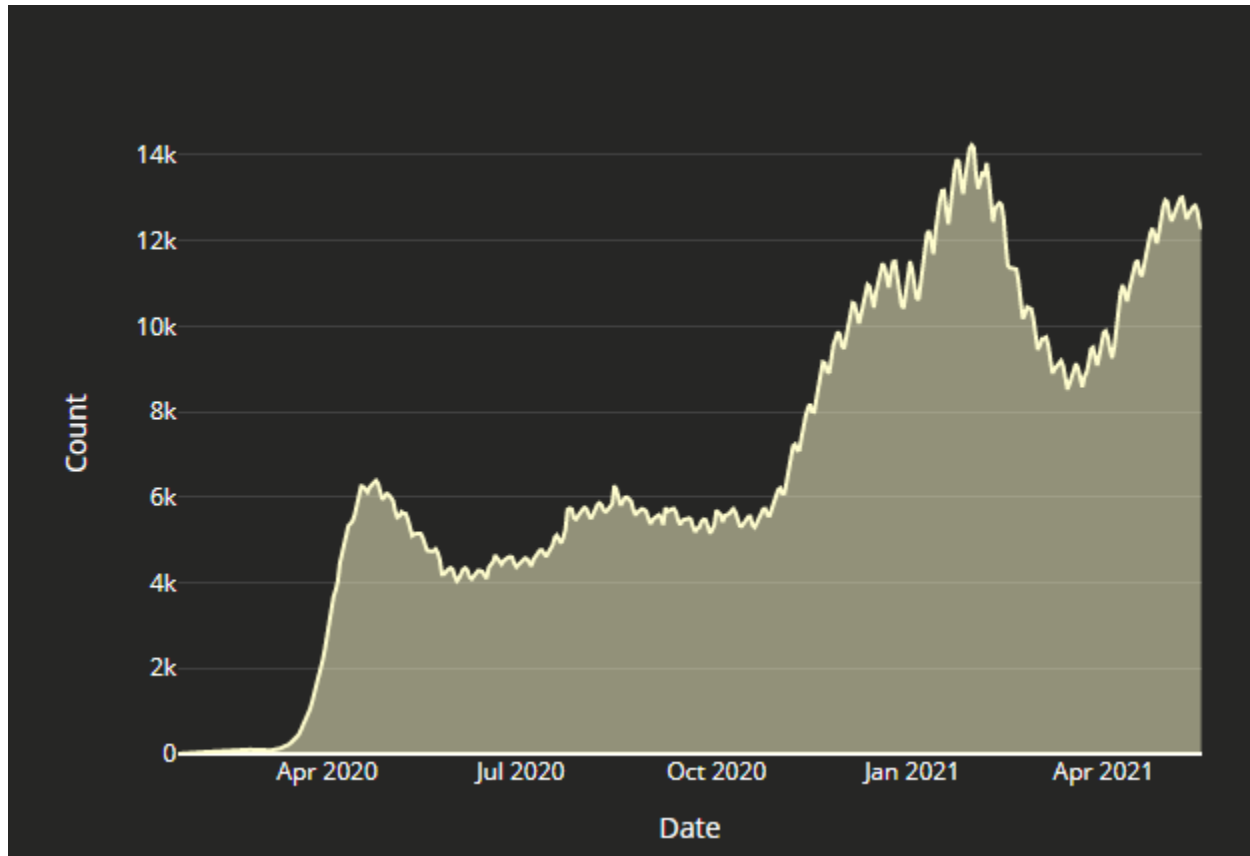| 163,609,594	539,662	677,080
Total Cases Reported	Current 7-Day Average*	Prior 7-Day Average

Reported deaths

The current 7-day rolling average is 12331. compare to last week rolling average of 12890 it's decreased by 4.5% and the highest daily reported deaths recorded 17906 is now 68.7% far from that peak.

Figure 3.2 - reported daily deaths

3,389,992

Total Deaths Reported

12,331

Current 7-Day Average*

12,890

Prior 7-Day Average

Vaccination

The current 7-day rolling average is 2.47 million doses given. compare to last week rolling average of 1.97 million it's increased by 20.24%. Countries use several types of vaccines for their vaccination program. Most countries use more than one brand. Oxford AstraZeneca and Pfizer BioNtech are widely used.
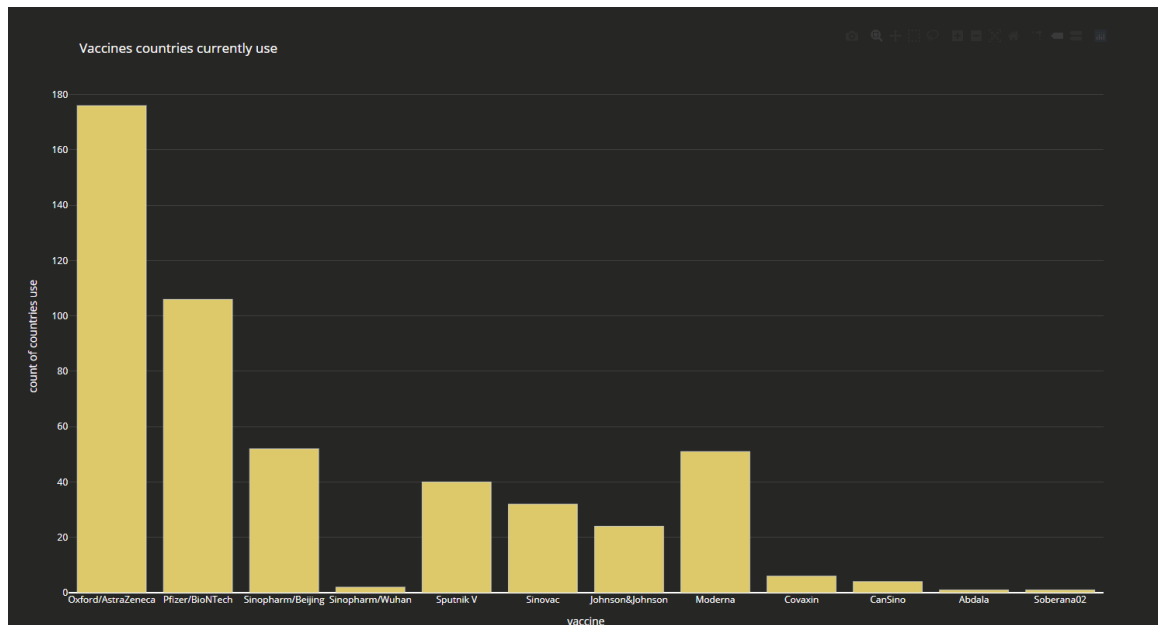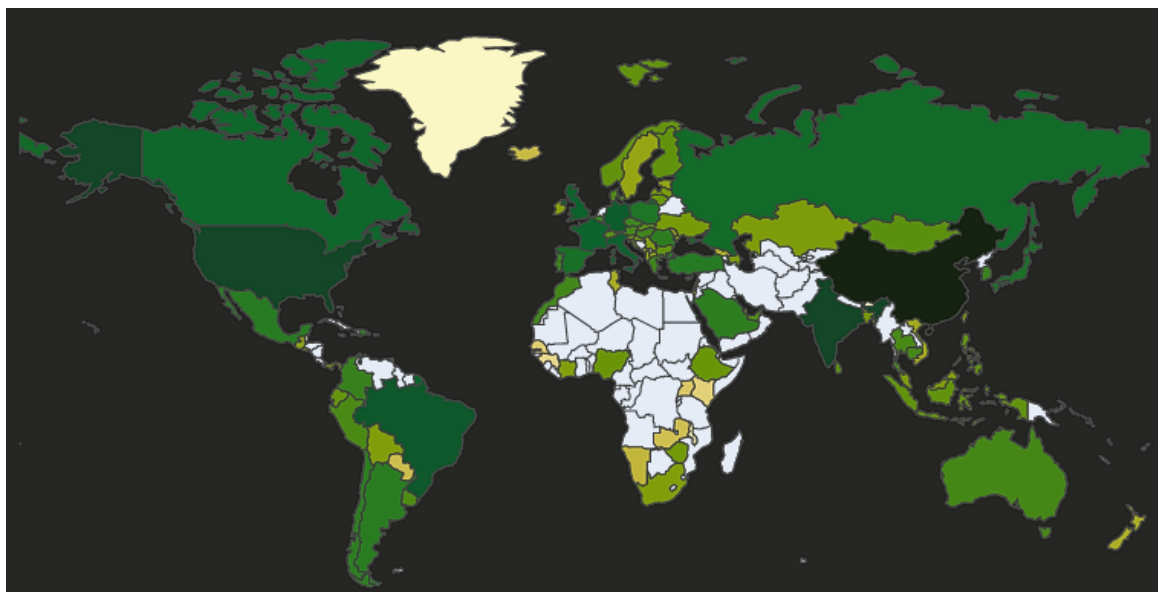
Figure 3.3 - brands of vaccines and their usage

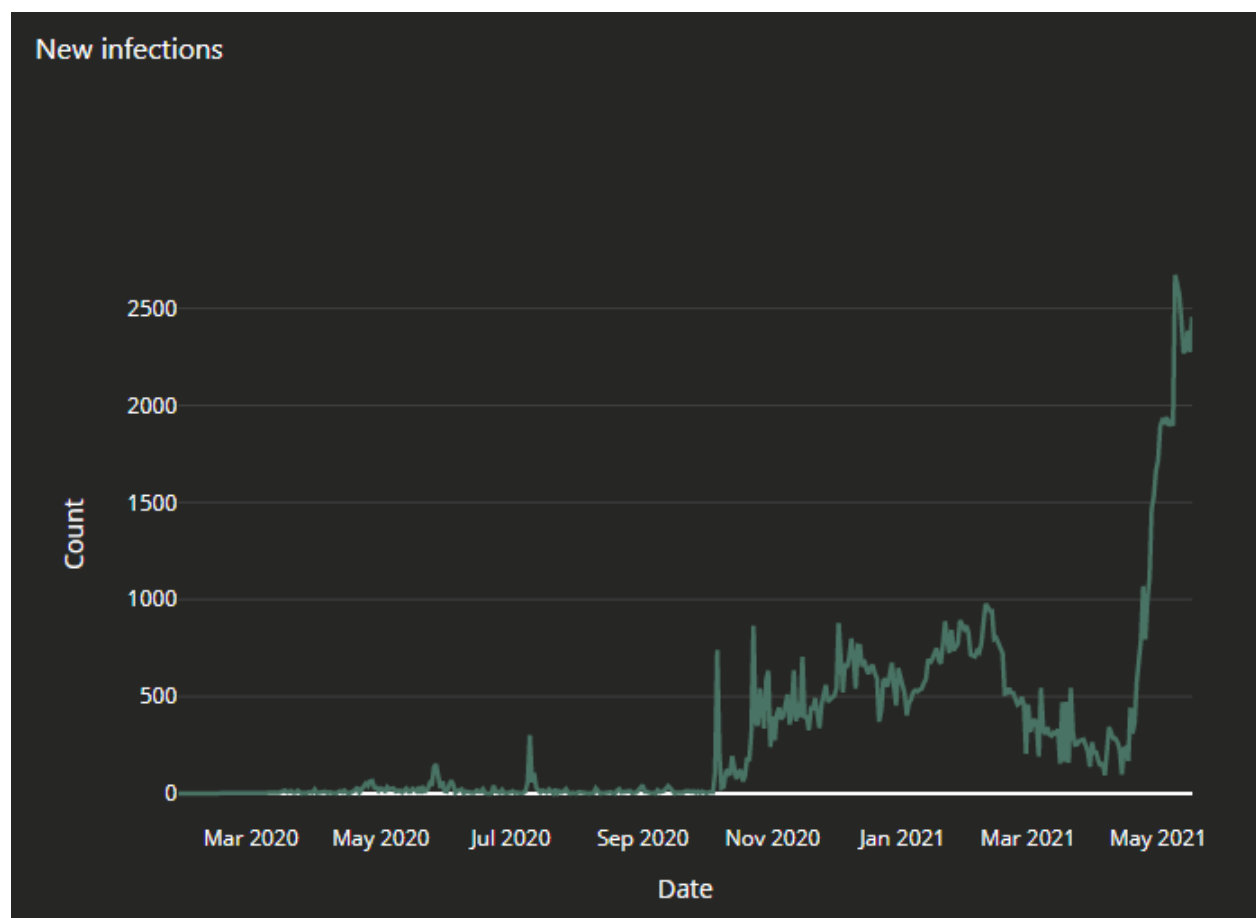Figure 3.3 - new vaccinations are done in last week

Sri Lanka

Reported cases

The current 7-day rolling average is 2382. compare to last week rolling average of 2429 it's decreased by 1.9% and the highest daily reported cases recorded 2672 is now 89.1% far from that peak.

Total Number Confirmed	145202
Total Number Recovered	121145

Figure 4.1 - reported daily cases

145,202

Total Cases Reported

2,382

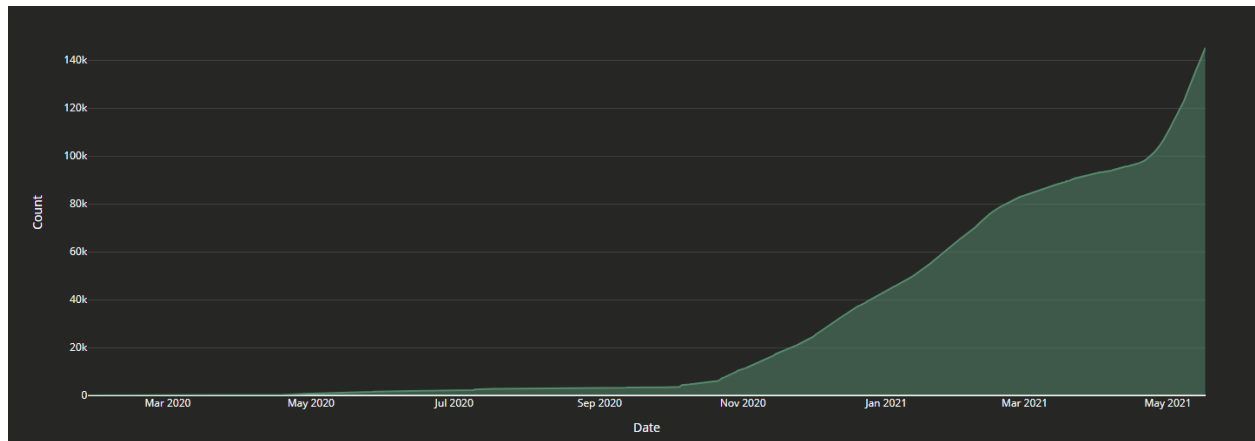Current 7-Day Average*

2,429

Prior 7-Day Average

Figure 4.2 - total cases so far
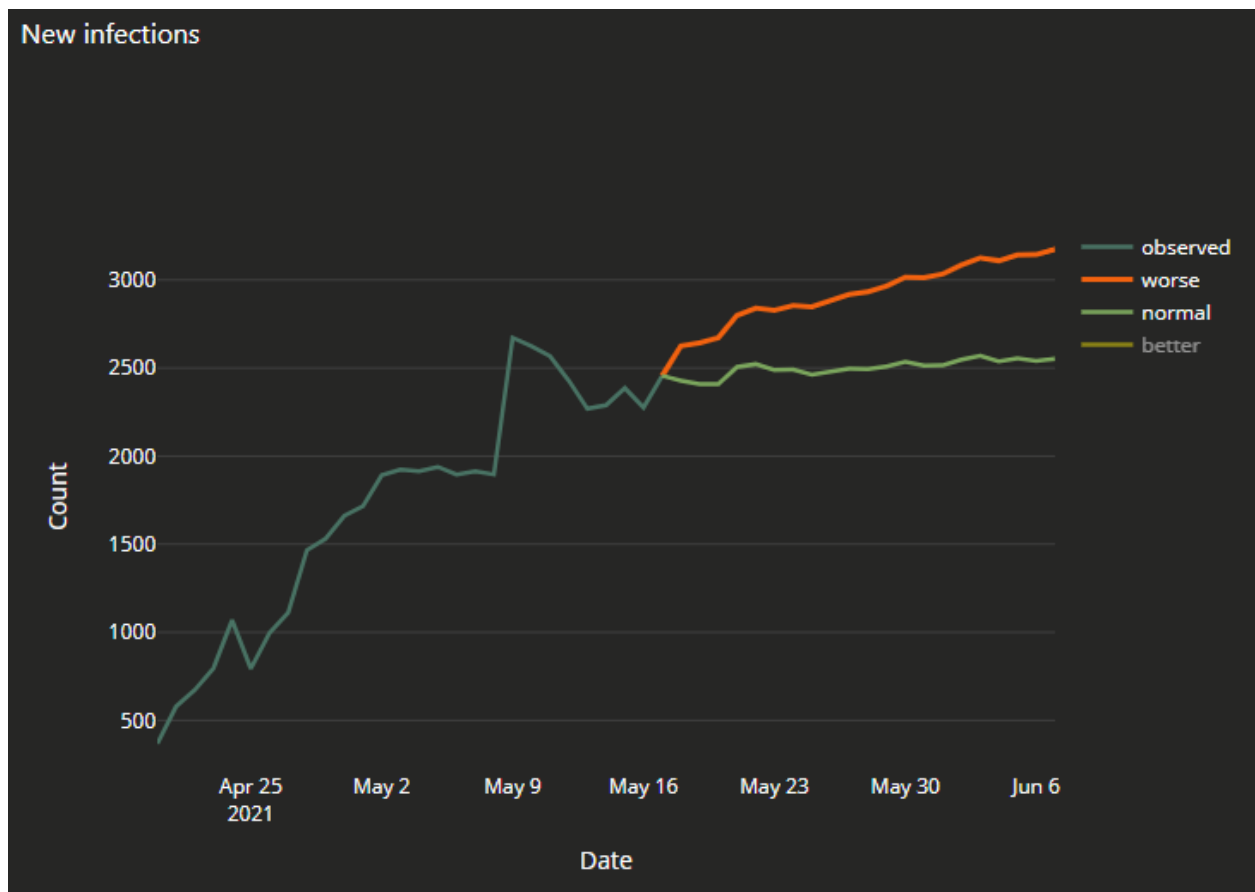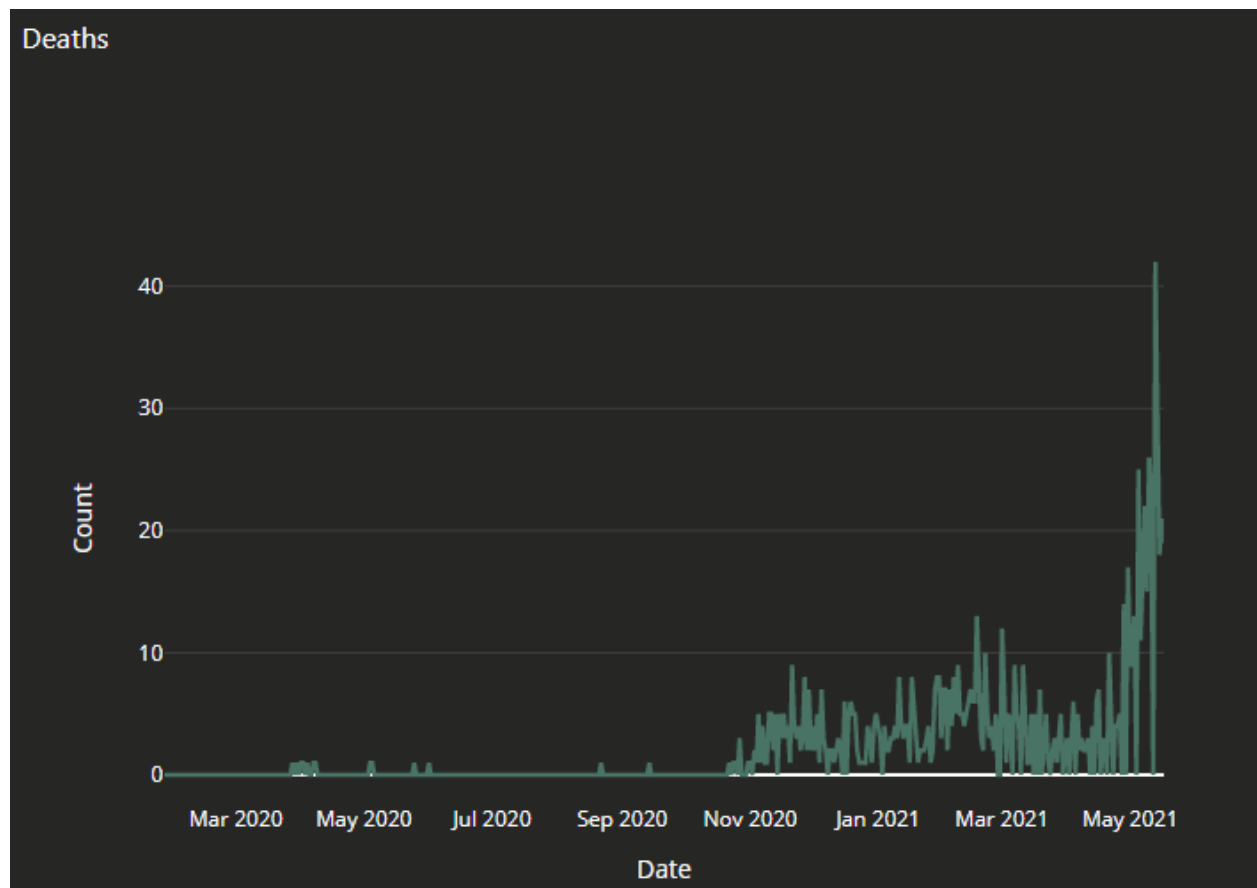
Our predictions

Figure 4.3 - predicted daily cases (red line shows worse situation)

Reported deaths

The current 7-day rolling average is 23. compare to last week rolling average of 15 it's decreased by 34.8% and the highest daily reported deaths recorded 42.

Figure 4.4 - daily reported deaths

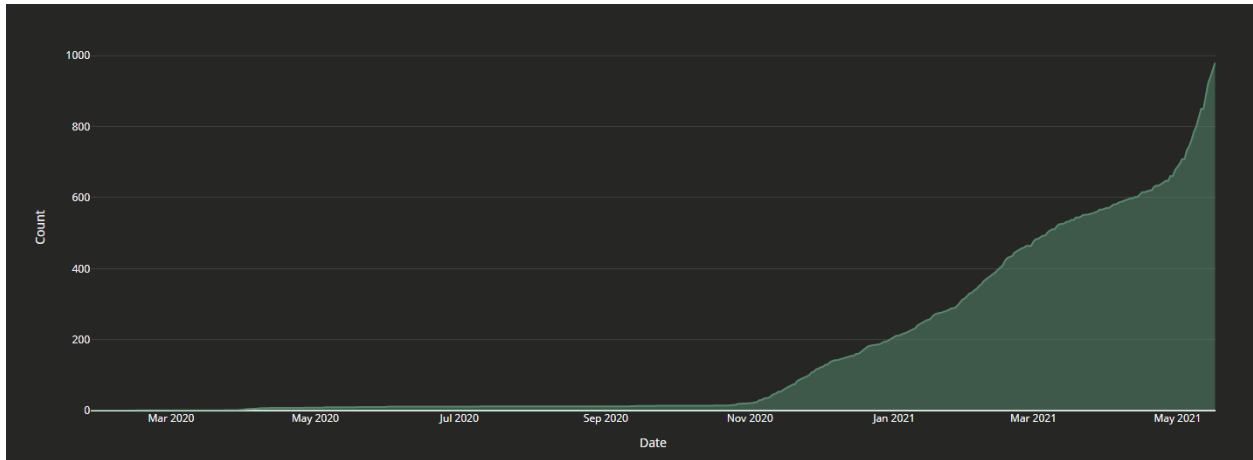| **981**	**23**	**15**
Total Deaths Reported	Current 7-Day Average*	Prior 7-Day Average
605	**376**	
Death mens	death womens	

Figure 4.5 - total deaths so far
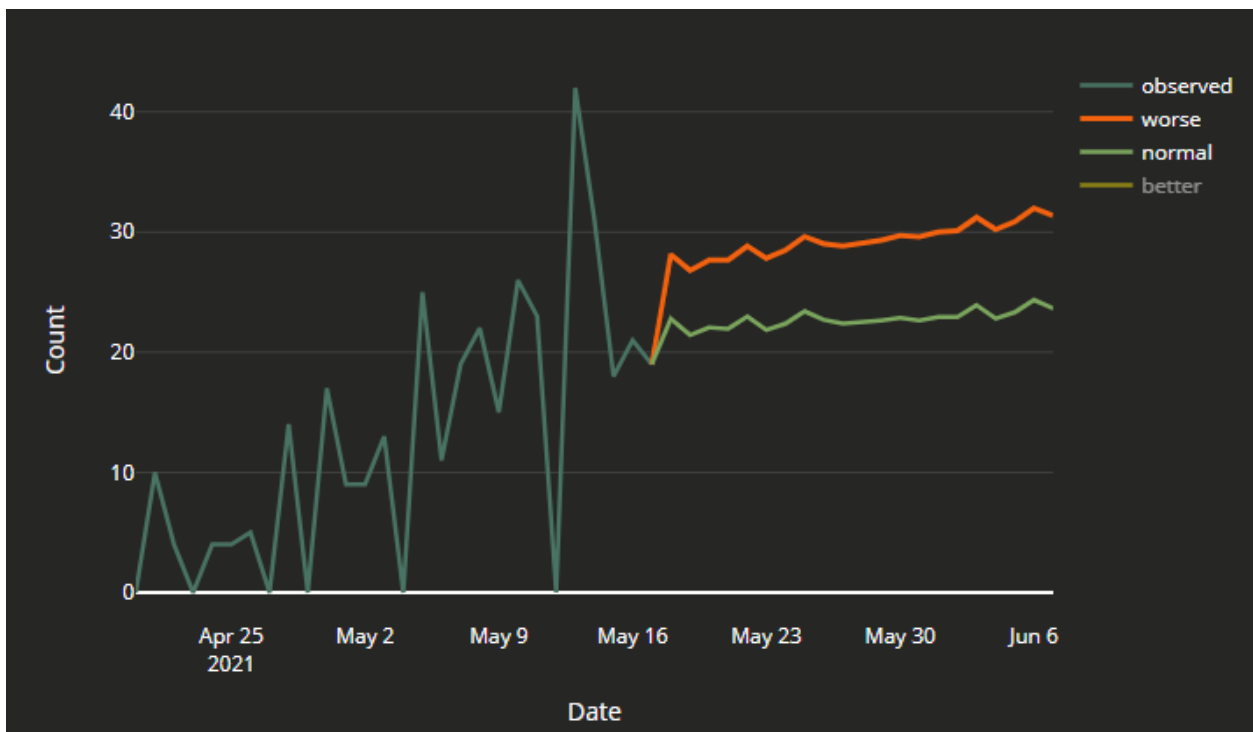
Our predictions

Figure 4.6 - predicted daily deaths (red line shows worse situation)

Vaccination

Sri Lanka has administered at least 1300558 doses of COVID vaccines so far. Assuming every person needs 2 doses, that's enough to have vaccinated about 3.037% of the country's population. During the last week reported, Sri Lanka averaged about 35189 doses administered each day. At that rate, it will take a further 61 days to administer enough doses for another 10% of the population. It is going at a rate of about 61516 doses per day during the last week which is about 51.289% slower than its fastest 7-day pace.

This vaccine rollout data is reported by the number of doses of coronavirus vaccines administered, not the number of people who have been vaccinated. Because most vaccines require two doses and many countries have different schedules to deliver the second dose, we don't know with this data how many people have ultimately received both doses.
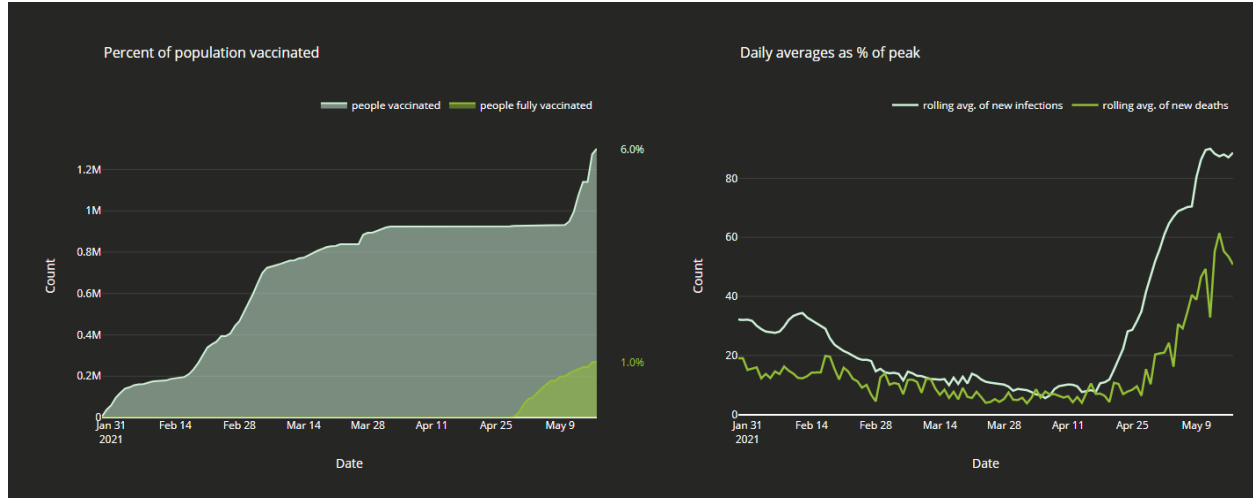

Figure 4.6 - vaccinations are done so far
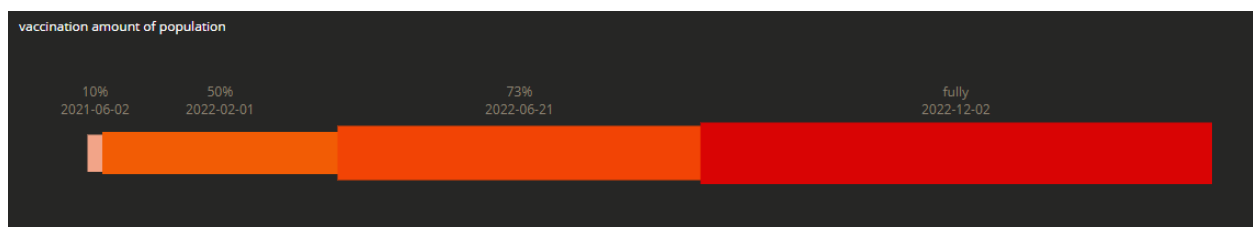
COVID-19 Vaccination	1st Dose	2nd Dose
Covishield Vaccine	925242	292457
Sinopharm Vaccine	424823	2435
Sputnik V	14699	-

Vaccines offered: Oxford-AstraZeneca, Sinopharm, Sputnik V, Pfizer-BioNTech Vaccination priority groups People are being offered a vaccine based on — occupation and age.

Virus variants

Although the emergence of SARS-CoV-2 may have resulted from recombination events between a bat SARS-like coronavirus and a pangolin coronavirus (through cross-species transmission), mutations have been shown to play an important role in the ongoing evolution and emergence of novel SARS-CoV-2 variants. The variant first sampled and identified in China is considered by researchers to differ from the progenitor genome "by three variants". Subsequently, many distinct lineages of SARS-CoV-2 have evolved.

Selected Characteristics of SARS-CoV-2 Variants of Interest

Name (Pango Lineage)	Spike Protein Substitutions	WHO Label	First Detected	Name (Nextstrainext ernal)
B.1.525	A67V, 69del, 70del, 144del, E484K, D614G, Q677H, F888L	Eta	United Kingdom/Nigeria – December 2020	20A/S:484K
B.1.526	(L5F*), T95I, D253G, (S477N*), (E484K*), D614G, (A701V*)	Iota	United States (New York) – November 2020	20C/S:484K
B.1.526.1	D80G, 144del, F157S, L452R, D614G, (T791I*), (T859N*), D950H		United States (New York) – October 2020	20C
B.1.617	L452R, E484Q, D614G		India – February 2021	20A

B.1.617.1	(T95I), G142D, E154K, L452R, E484Q, D614G, P681R, Q1071H	Kappa	India – December 2020	20A/S:154K
B.1.617.2	T19R, (G142D), 156del, 157del, R158G, L452R, T478K, D614G, P681R, D950N	Delta	India – December 2020	20A/S:478K
B.1.617.3	T19R, G142D, L452R, E484Q, D614G, P681R, D950N		India – October 2020	20A
P.2	E484K, (F565L*), D614G, V1176F	Zeta	Brazil – April 2020	20J

Selected Characteristics of SARS-CoV-2 Variants of Concern

Name (Pango Lineage)	Spike Protein Substitutions	WHO Label	First Detected
B.1.1.7	69del, 70del, 144del, (E484K*), (S494P*), N501Y, A570D, D614G, P681H, T716I, S982A, D1118H (K1191N*)	Alpha	United Kingdom

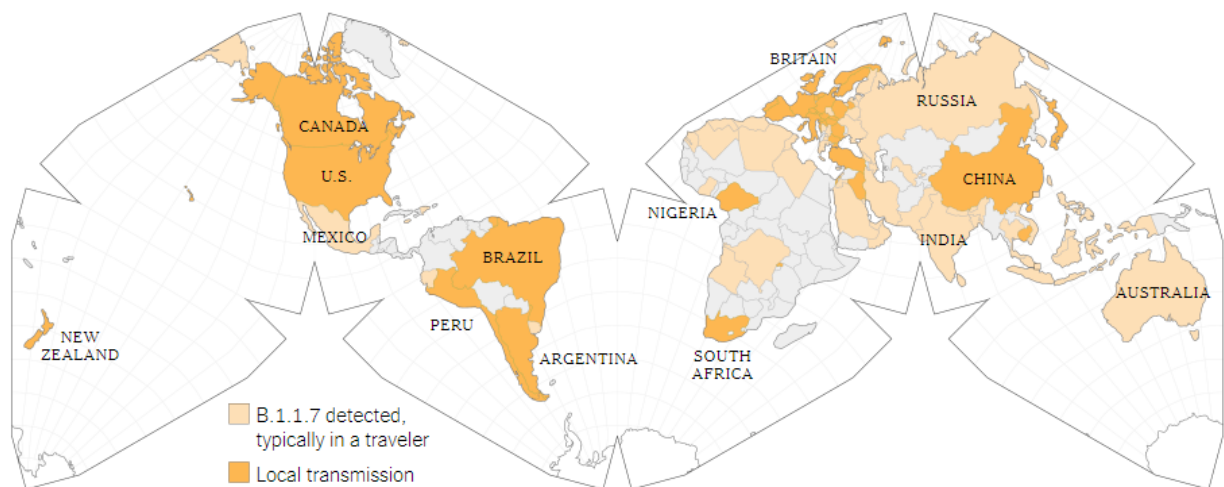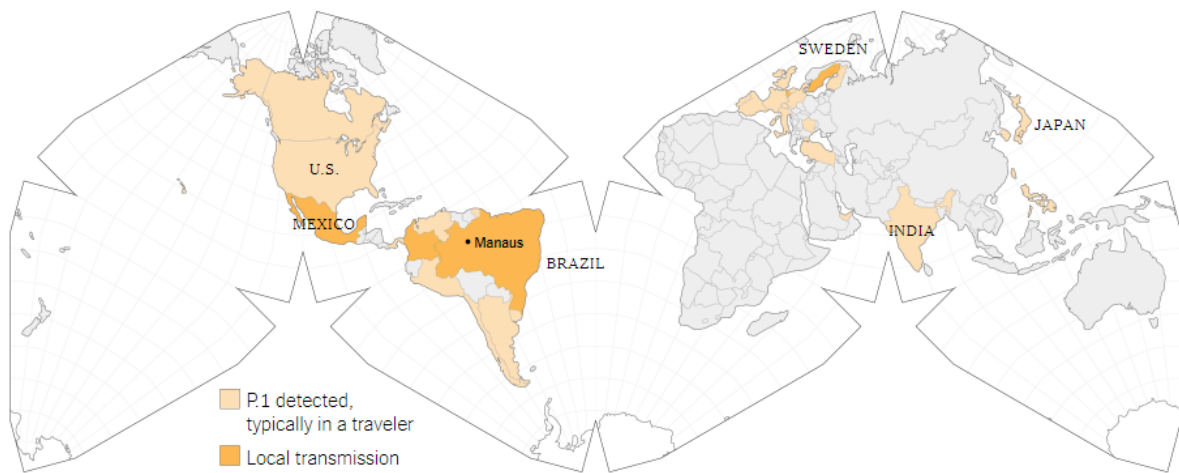| B.1.351	D80A, D215G, 241del, 242del, 243del, K417N, E484K, N501Y, D614G, A701V	Beta	South Africa
B.1.427	L452R, D614G	Epsilon	United States-(California)
B.1.429	S13I, W152C, L452R, D614G	Epsilon	United States-(California)
P.1	L18F, T20N, P26S, D138Y, R190S, K417T, E484K, N501Y, D614G, H655Y, T1027I	Gamma	Japan/ Brazil

Figure 5.1 - more dangerous B.1.1.7 transmission

Figure 5.2 - more deadly p.1 (Brazile version) transmission

Data Sources

- OWID repository - https://github.com/owid/covid-19-data/tree/master/public/data
- epidemiology unit ministry of health Sri Lanka
  - https://www.epid.gov.lk/web/index.php?option=com_content&view=article&id=225&Itemid=518&lang=en
- health promotion bureau - https://hpb.health.gov.lk/en/api-documentation
- world bank - https://data.worldbank.org/?type=shaded
- Wikipedia - https://en.wikipedia.org/wiki/COVID-19_pandemic_in_Sri_Lanka
- A3M - https://global-monitoring.com/gm/page/events/epidemic-0002015.fTDtGCxti2qN.html?lang=en
- Johns Hopkins coronavirus resources centre - https://coronavirus.jhu.edu/region/sri-lanka
- local media reports -

  - newsFirst https://www.newsfirst.lk/?s=covid
  - adaDerana http://www.adaderana.lk/search_results.php?mode=2&show=1&query=lockdown