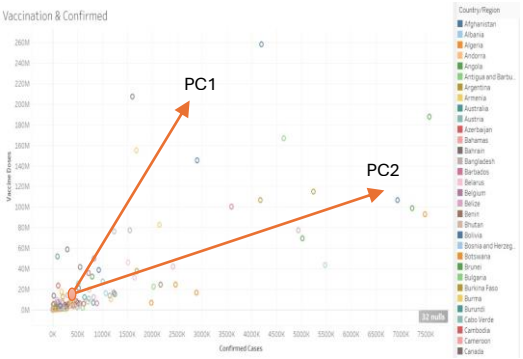
Vaccine Analysis for COVID-19

Our analysis examines vaccine effectiveness in reducing deaths and confirmed cases, tracks vaccine distribution over time, and projects future demand. By analyzing vaccination trends, regional disparities, and outcomes, the evaluation identifies target markets and strategies to optimize global vaccination coverage and address unfulfilled demands.

Relationship between deaths and vaccines

No statistic significant correlation could be established between the doses of vaccines administrated and the number of deaths. However, cases like US and UK suggests that it contributed to reduce the increasing curve after the vaccine began to take effect. For example, United States started the vaccines in December 2020, when they had a high average number of deaths (208,780) and they decreased the curve of new cases for an average of 13,000 confirmed cases within less than 2 months.

Relationship between confirmed cases and vaccines



No statistically significant correlation has been found between COVID-19 cases and vaccine doses administered. However, principal component analysis (PCA) highlights three groups of countries:

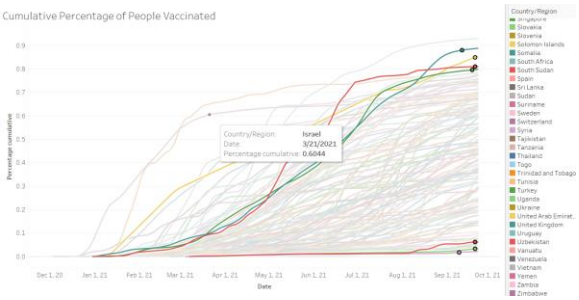
- **PC2**: Russia, France, and Turkey reported high case numbers but low vaccination rates, with moderate death rates. This proved that the impact was lower compared to countries with big populations and higher number of visitors like US.
- **PC1**: Indonesia had both high case numbers and significant vaccination coverage.
- **Better outcomes**: Countries like Canada, Japan, and Poland reported fewer cases and higher vaccine coverage.

The impact of vaccines depends not only on the number of doses administrated but also on government strategies, such as prioritization, containment measures, and distribution policies.

Future demand trends

Pfizer's key target markets should include the United States, Brazil, and Turkey, given their rising case numbers (see graph in the Appendix). While the United Kingdom and India also face increasing cases, their established regional manufacturers could potentially reduce the demand for Pfizer's vaccines. Mexico presents another critical opportunity, with recent data indicating a significant spike in deaths.

Vaccine Distribution



Malta, Seychelles, Iceland, Portugal, and the UAE have given more than 80% of their population shots, while developing countries like Nigeria, Sierra Leone, Uganda, Kenya, and Malawi are below 3%, conveying access setbacks. Collaborating with these governments presents prospects for mutual benefit but may be restricted by limited economic resources. Vaccination rates are above 70% in economically strong countries like the US, France, Canada, Singapore, Belgium, and Italy. China vaccinated only 35% of its population but showed lower mortality rates due to effective planning. On overall, high-income countries exceeded 70% coverage, while most African and developing countries have less than 10%. Moderately affluent countries like Brazil, Mexico, Peru, and India reached 35%-70%.

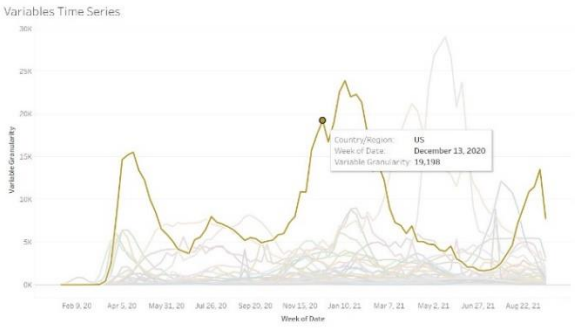
Link for the video explanation:

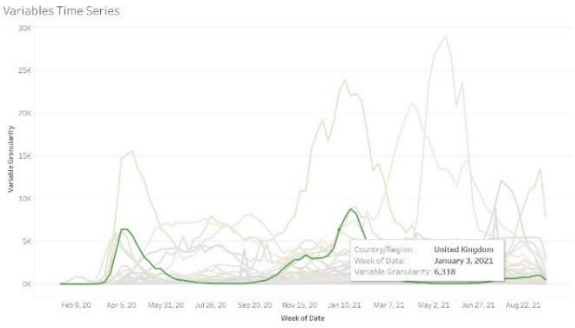
https://www.youtube.com/watch?v=RdKkUg5KpUw

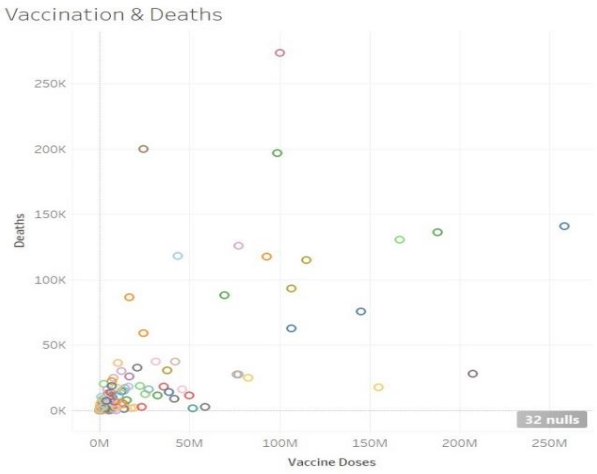
Appendix:

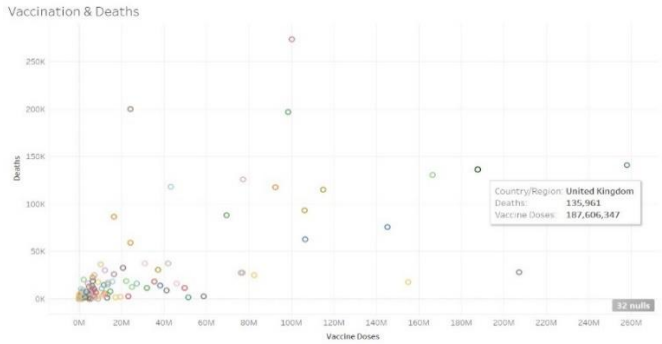
1. Our World in Data. (n.d.). *COVID-19 vaccinations dataset*. Retrieved December 13, 2024, from https://github.com/owid/covid-19-data/tree/master/public/data/vaccinations
2. Humanitarian Data Exchange. (n.d.). *Novel coronavirus (COVID-19) cases*. Retrieved December 13, 2024, from

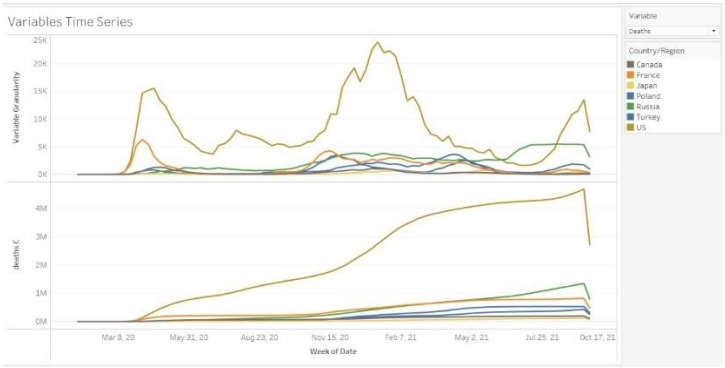
https://data.humdata.org/dataset/novel-coronavirus-2019-ncov-cases/resource/61a3a172-9aa3-4d00-b9f4-1c94ed1c76fc

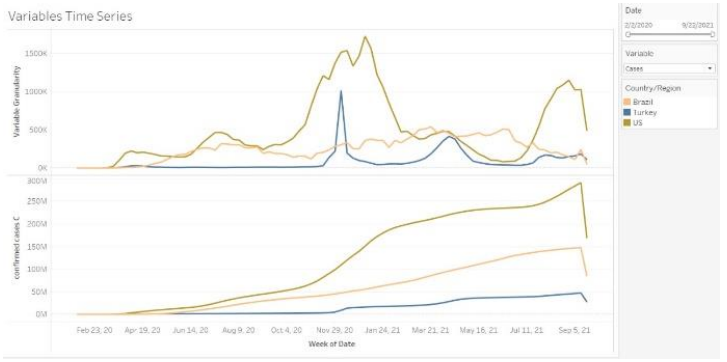


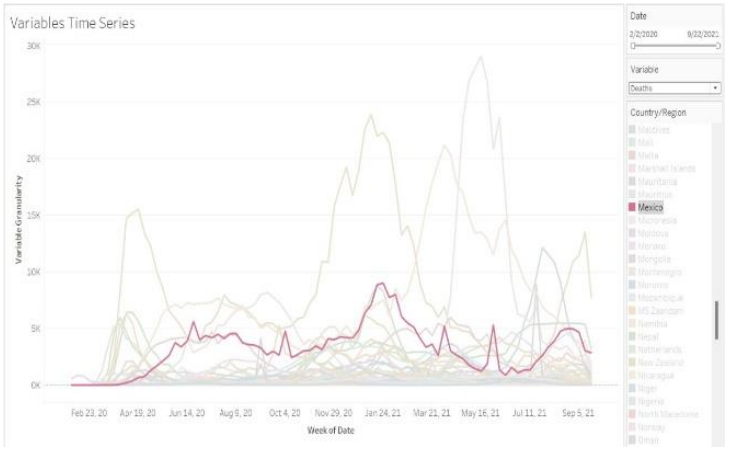


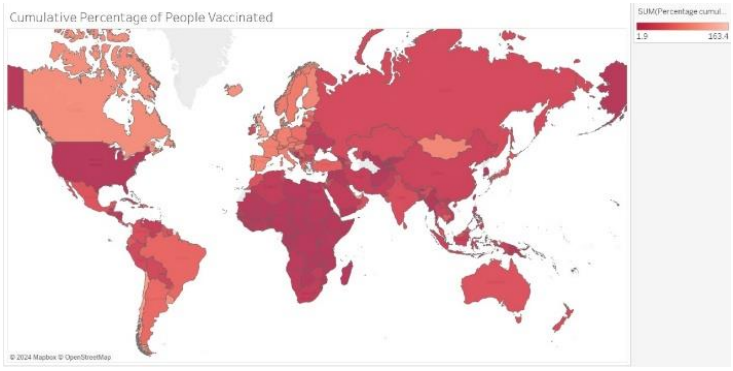




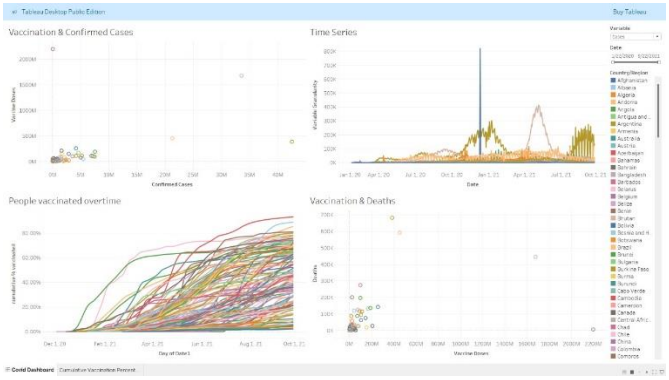







Cumulative Percentage of People Vaccinated
SUM(Percentage cumul...
1.9
163.4
© 2024 Mapbox © OpenStreetMap

Dashboards:


Vaccination & Confirmed Cases
Time Series
People vaccinated overtime
Vaccination & Deaths


Dashboard
Layout
Default
Phone
Device Preview
Size
Automatic
Sheets
Fully Vc / Deaths per 100
Fully Vaccinated / Cases per 10...
Doses per 100 ad by Country
Type of Vaccines by Country
Percentage of full fvc
Distribution First Vaccines
Sheet 8
Number of Deaths Cumulative
Max Deaths by Country
Objects
Horizontal Container
Vertical Container
Text
Extension
Ask Data
Data Story
Image
Blank
Workflow
Web Page
Tiled
Floating
Show dashboard title
Max Deaths by Country
Fully Vc / Deaths per 100
DEATHS PER 100
Max. Persons Fully Vaccinated Per100
Distribution First Vaccines
Year of Firs...
Month of Fi...
2020
July
November
December
2021
January
February
March
April
Type of Vaccines by Country
Country
Philippines
Pakistan
Maldives
Bangladesh
Tunisia
Thailand
Paraguay
occupied Palestinian terri...
Mexico
Libya
Lao People's Democratic R...
Number Vaccines Types Used