

COVID-19



COVID-19

Data Analysis and Visualization using Power BI

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Overview

01 Project Overview

02 Objective "phases"

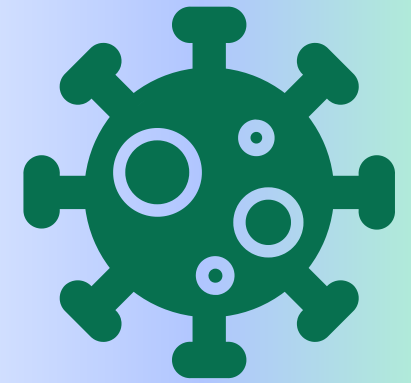
03 Cleaning

04 Manage
Relationships

05 Visualizations

06 Manage Security

07 Dashboard



Project Overview

- The COVID-19 pandemic has had an unprecedented global impact, making data analysis crucial for understanding its spread, impact, and recovery trends. This project focuses on analyzing key COVID-19 datasets using Power BI to extract valuable insights.



The project involves several phases:



The raw data from multiple COVID-19 datasets is cleaned, merged, and prepared for analysis. This includes handling missing values, standardizing data formats, and ensuring data quality.

Data Cleaning and Preprocessing



Key analysis questions were identified, such as:

- What is the global trend of COVID-19 cases over time?
- Which countries or regions are most affected?
- How do recovery rates vary across different regions?

Data Analysis



A Power BI dashboard was created to provide interactive visualizations of the insights. This dashboard allows for the exploration of COVID-19 trends by region, time period, and other factors, offering a comprehensive view of the pandemic's progression.

Dashboard Visualization

Cleaning

UnPivoted Column

Before

3/4/20	123 3/5/20	123 3/6/20	123 3/7/20	123 3/8/20
Valid 100%	Valid 100%	Valid 100%	Valid 100%	Valid 100%
Error 0%	Error 0%	Error 0%	Error 0%	Error 0%
Empty 0%	Empty 0%	Empty 0%	Empty 0%	Empty 0%
distinct, 56 unique	69 distinct, 52 unique	77 distinct, 60 unique	78 distinct, 57 unique	85 distinct, 66 unique
4	4	4	4	4
0	0	0	0	0
12	12	17	17	17
1	1	1	1	1
0	0	0	0	0
0	0	0	0	0
1	1	2	8	8
1	1	1	1	1
0	0	0	0	0
22	22	26	28	28
1	1	0	0	0
11	13	13	13	13



After

te	123 Value
100%	Valid 100%
0%	Error 0%
0%	Empty 0%
ct, 0 unique	880 distinct, 860 unique
	0
	0
	0
	0
	0
	0
	0
	0
	0
	0
	0

PROPERTIES

Name

covid_19_confirmed

All Properties

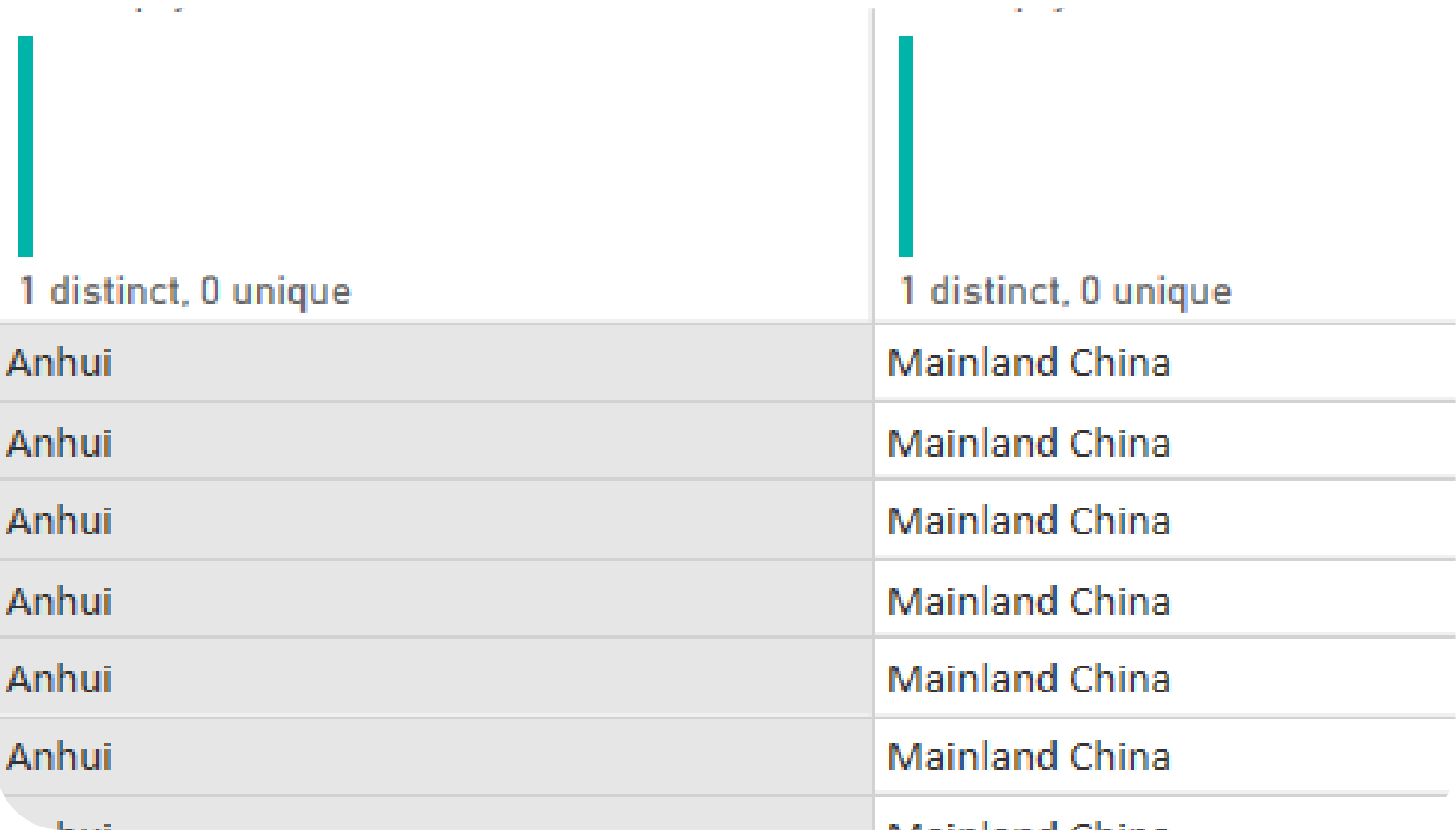
APPLIED STEPS

- Source
- Change Type
- Promoted Headers
- Changed Type
- Replaced Value
- Replaced Value1
- Replaced Value2
- Replaced Value3
- Unpivoted Columns
- Changed Type1

Cleaning

Remove Duplicates

Before

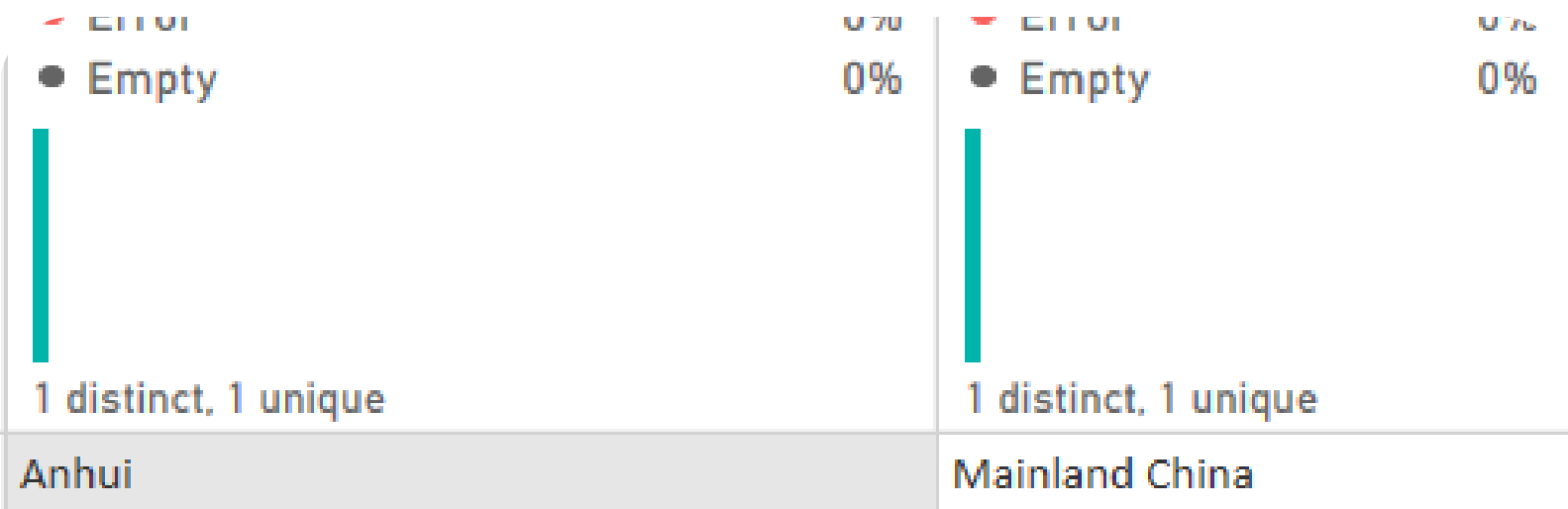


A table visualization showing a dataset with two columns. The first column contains the value 'Anhui' repeated six times. The second column contains the value 'Mainland China' repeated six times. Above the table, a teal bar chart shows a single bar at 100%, and text indicates '1 distinct, 0 unique'.

Anhui	Mainland China
Anhui	Mainland China
Anhui	Mainland China
Anhui	Mainland China
Anhui	Mainland China
Anhui	Mainland China



After



A table visualization showing the result of deduplication. The first column contains 'Anhui' and the second column contains 'Mainland China'. Above the table, a teal bar chart shows a single bar at 100%, and text indicates '1 distinct, 1 unique'. The table is part of a larger interface with error bars and progress indicators.

Anhui	Mainland China
-------	----------------

Cleaning

Replace Null Values

Replace Values

Replace one value with another in the selected columns.

Value To Find

Replace With

Replace Values

Replace one value with another in the selected columns.

Value To Find

Replace With

▸ Advanced options

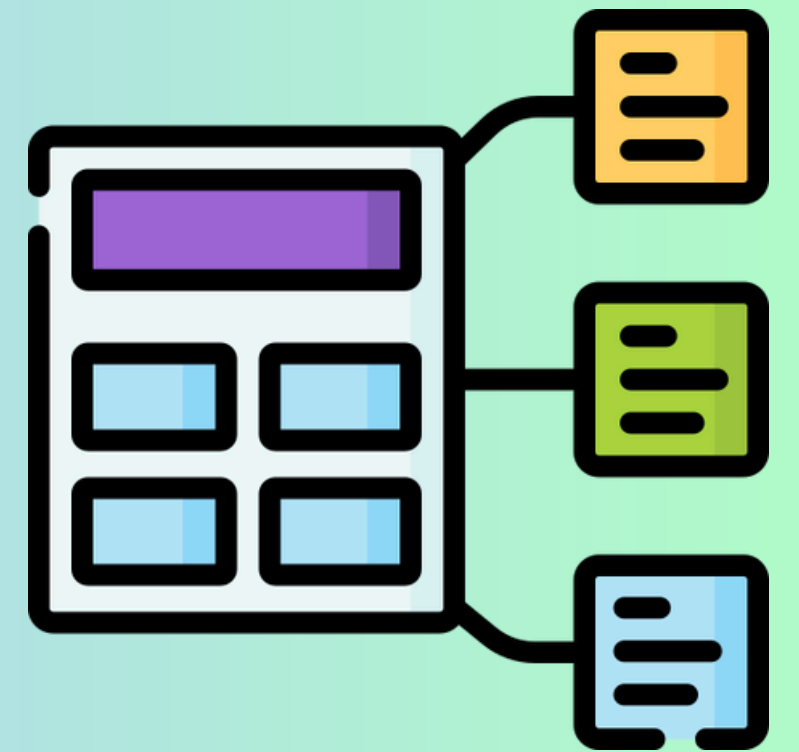
Replace Values

Replace one value with another in the selected columns.

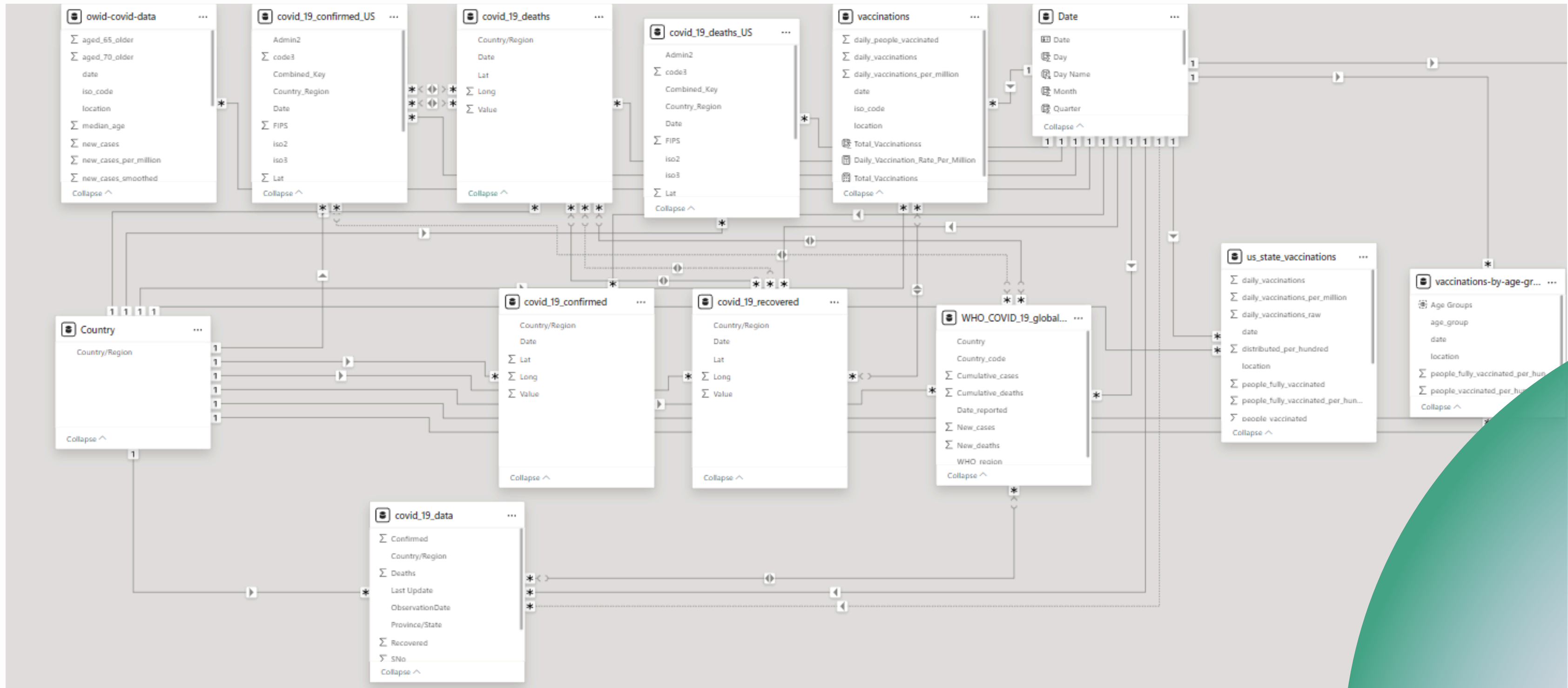
Value To Find

Replace With

Manage Relationships











Manage Relationships



Manage Relationships

Date Hierarchy

- ✓  Date
 -  Date
- ✓  Date Hierarchy
 -  Date
 -  Year
 -  Quarter
 -  Month
 -  Day

Country Table

- ✓  Country
 - Country/Region

Visualization



Visualizations

Overview



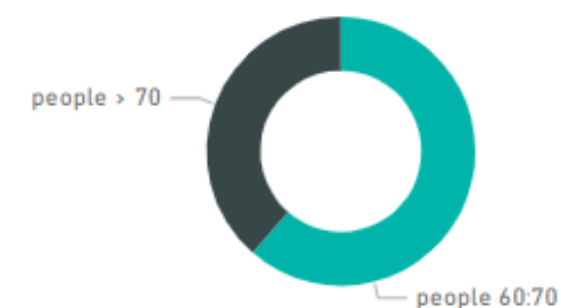
Country/Region

- ☐ Azerbaijan
- ☐ ('St. Martin')
- ☐ Afghanistan
- ☐ Albania
- ☐ Algeria


Year

- ☐ 2019
- ☐ 2020
- ☐ 2021
- ☐ 2022
- ☐ 2023

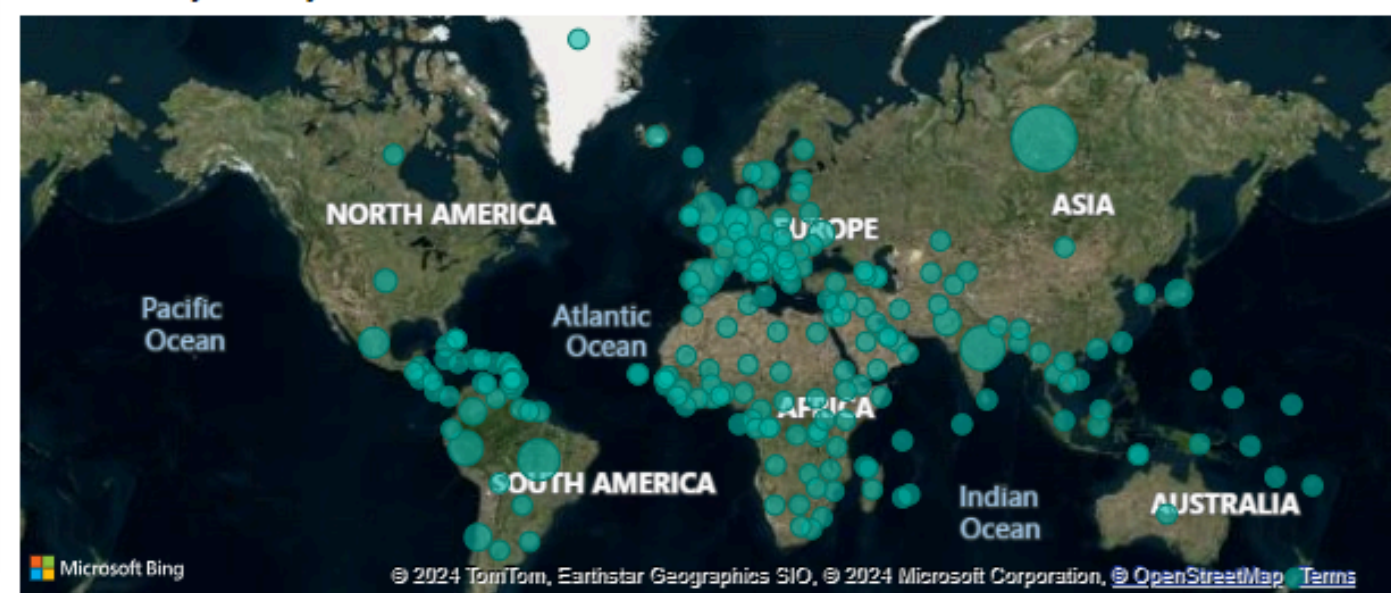
people 60:70 and people > 70



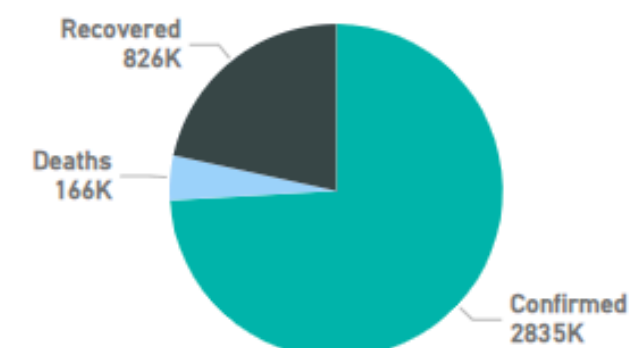
 **2174**
people 60:70

 **1367**
people older than 70

Total Cases By Country



Confirmed, Deaths and Recovered



 **19.13M**
Total Vaccinations

166K
Deaths Cases

826K
Recovered Cases

3M
Confirmed Cases



Overview

Global

Global 2

Vaccinations

USA

USA_VAC

Q&A

Global Report

Global Report



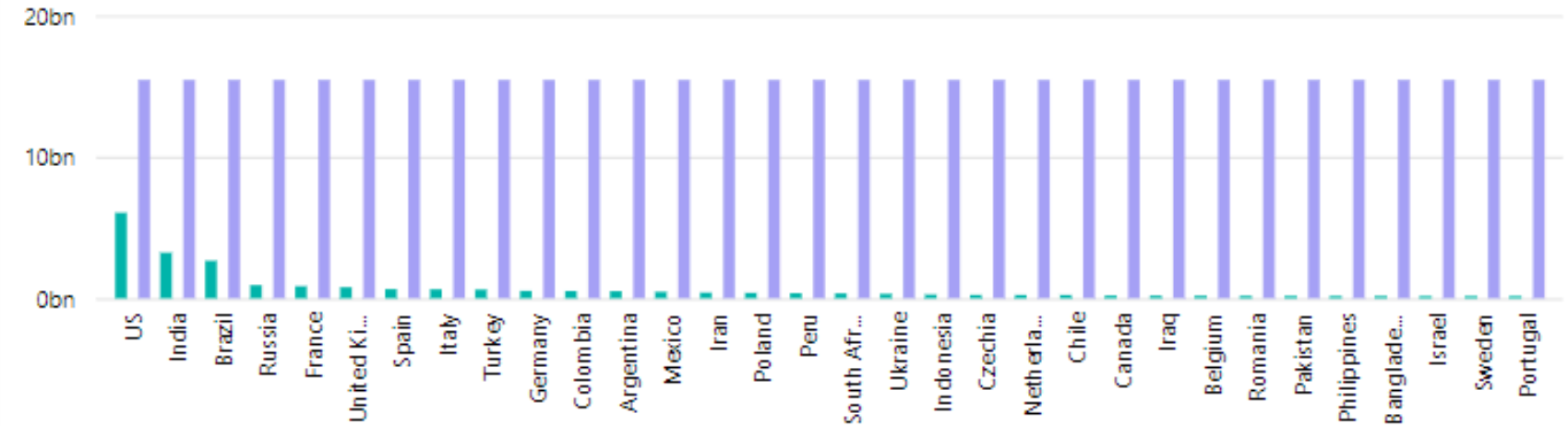
Country

- ☐ Afghanistan
- ☐ Albania
- ☐ Algeria
- ☐ Andorra
- ☐ Angola
- ☐ Antigua and Barbuda
- ☐ Argentina
- ☐ Armenia
- ☐ Australia
- ☐ Austria

Country	Confirmed Cases	Deaths Cases	Recovered Cases
Russia	414330	4849	175514
Germany	173043	7812	150177
Spain	229541	27321	143374
India	267387	7745	135208
Italy	223098	31368	115288
Mexico	56594	6090	38419
Pakistan	113704	2255	36308
Japan	16592	881	14096
Ukraine	24563	724	10053
Colombia	24149	833	6132
Diamond Princess	712	10	587
US	881	8	461
Canada	51	1	123
	193201	41314	82
West Bank and Gaza	84	1	17
France	2358	49	13
Total	2835118	165550	825857

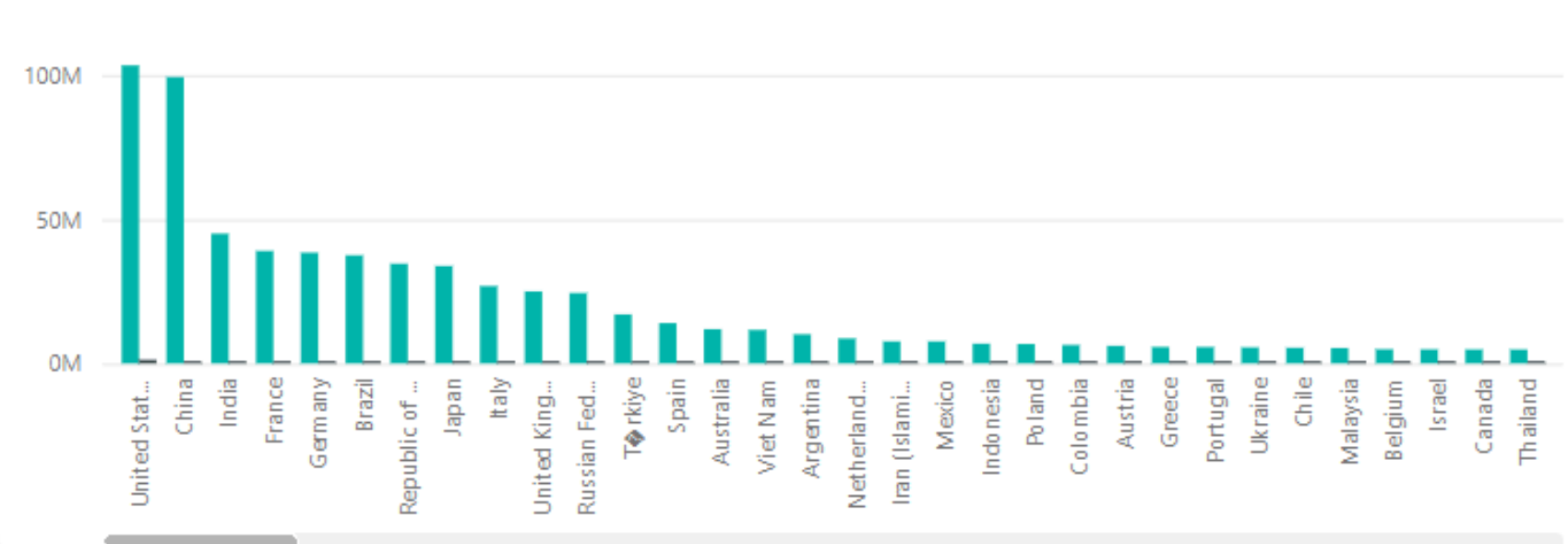
Confirmed, Deaths and Recovered cases by Country

Confirmed Deaths Recovered cases



New cases and New deaths by Country

New cases New deaths



Overview

Global

Global 2

Vaccinations

USA

USA_VAC

Q&A



Global Report

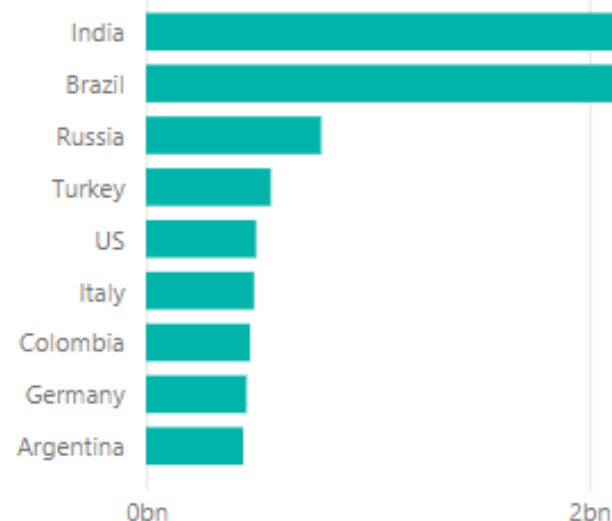
Global Report



Age Groups

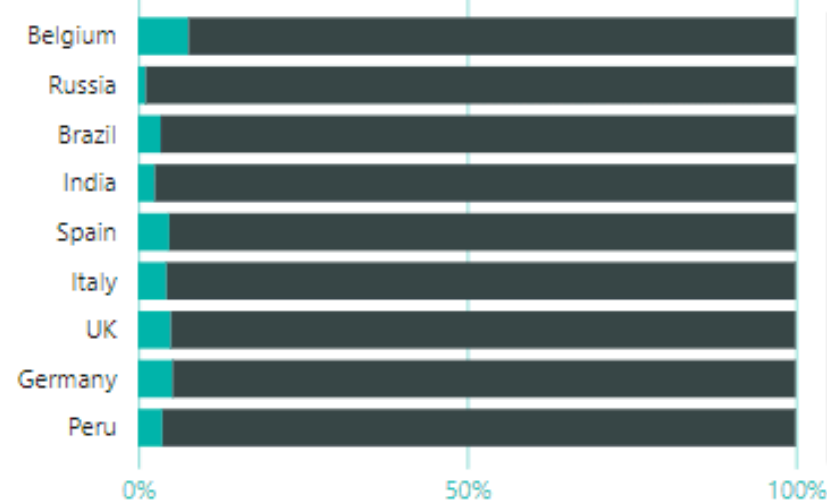
- ☐ 100+
- ☐ 11-20
- ☐ 21-30
- ☐ 31-40
- ☐ 4-10
- ☐ 41-50
- ☐ 51-60
- ☐ 61-70
- ☐ 71-80
- ☐ 81-90
- ☐ 91-100

Recovered Cases by Country



Confirmed Cases and Total Cases By Region by Country

Confirmed Cases Total Cases By Region



location

Australia

Age Groups

x

people fully vaccinat...
4212428

Hong Kong
668924

Australia
307370

Israel
306737

Japan
122165

Jersey
117252

Ireland
85604

Portugal
83182

11-20
46414

91-100
40039

81-90
39216

71-80
38512

61-70
34899

51-60
30016

41-50
29109

Overview

Global

Global 2

Vaccinations

USA

USA_VAC

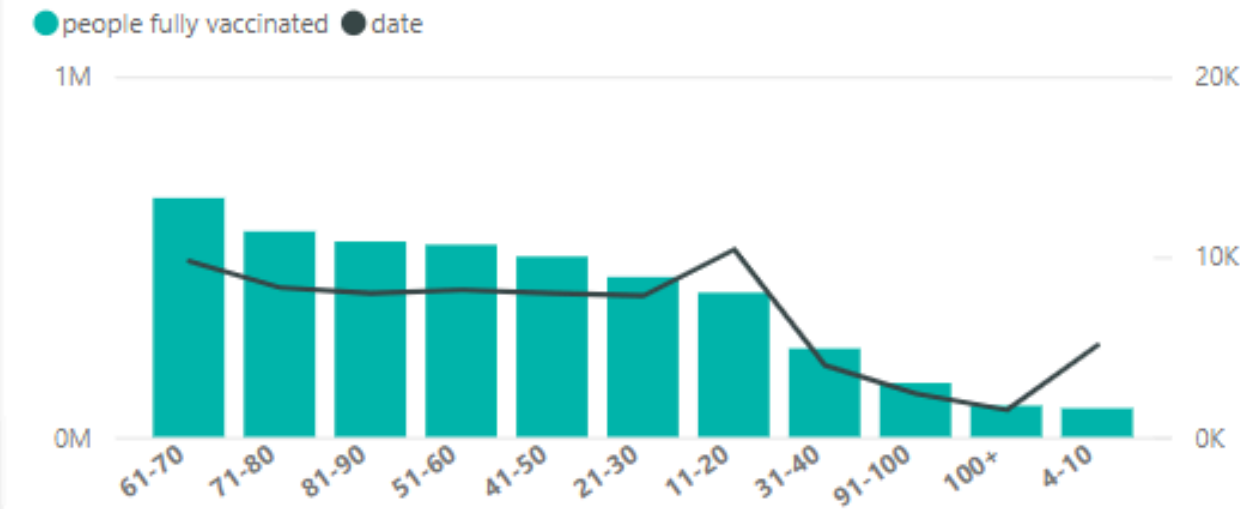
Q&A



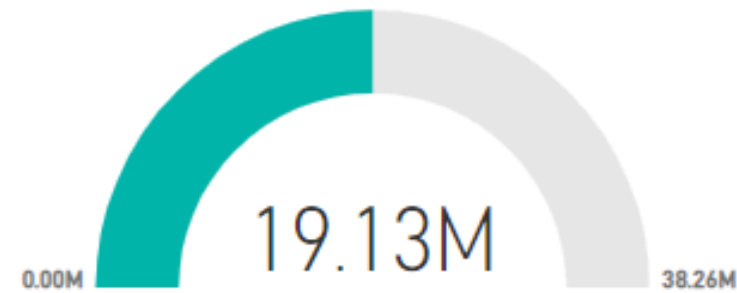
Vaccinations



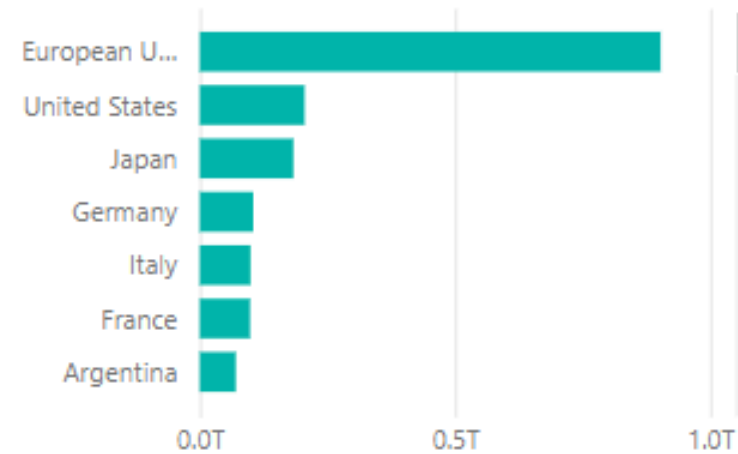
people fully vaccinated and date by Age Groups



Total Vaccinations and Total population



total vaccinations by location



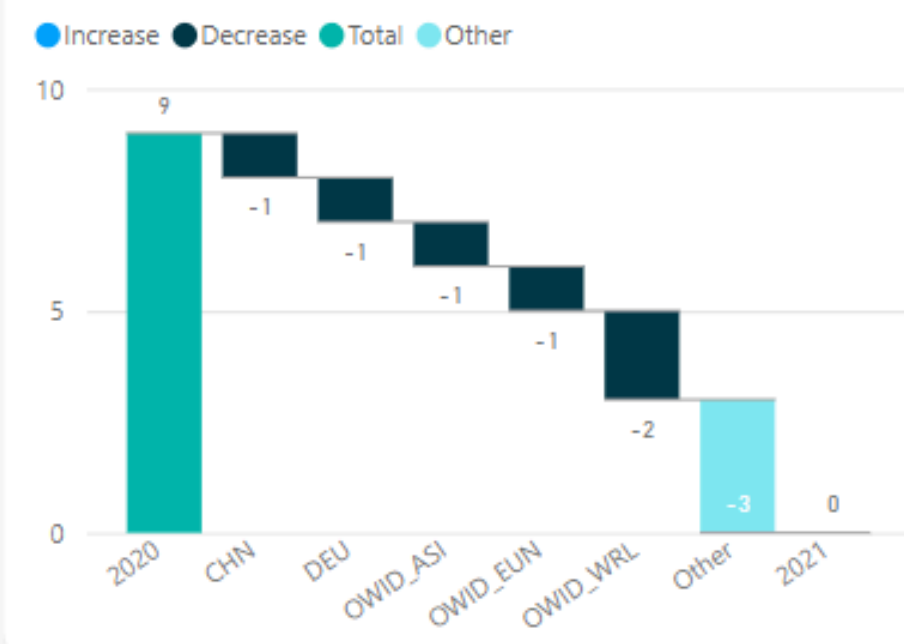
new cases by Year



location vaccine Total vaccinations

location	vaccine	Total vaccinations
Argentina	CanSino	291185458
Chile	CanSino	0
Ecuador	CanSino	63941503
Czechia	Covaxin	55
European Union	Covaxin	181133
Portugal	Covaxin	6148
Austria	Johnson&Johnson	31187339
Belgium	Johnson&Johnson	39414527
Bulgaria	Johnson&Johnson	49916981
Canada	Johnson&Johnson	525703
Total		1900438499230

new cases by Year and iso code



Overview

Global

Global 2

Vaccinations

USA

USA_VAC

Q&A

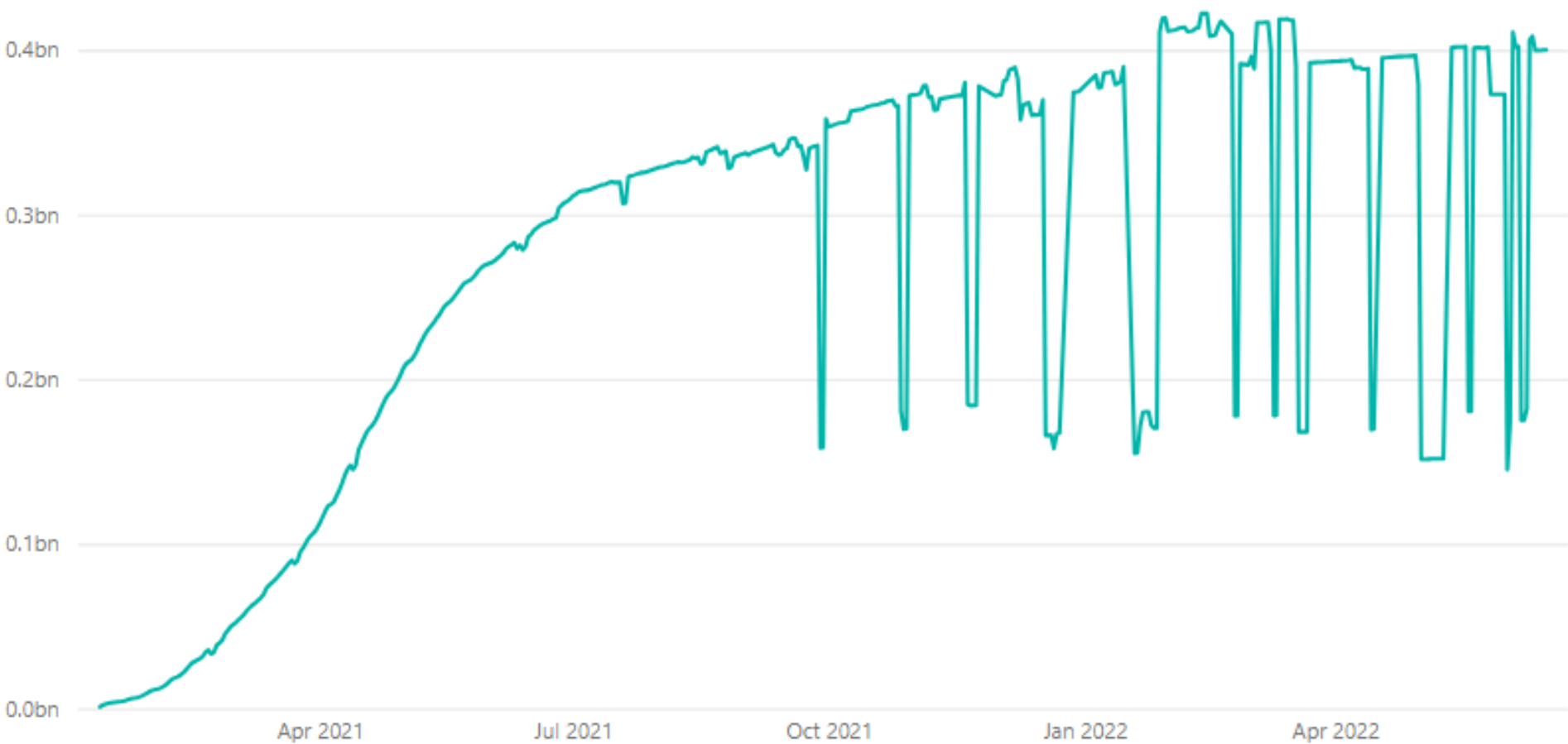
USA - Cases



633K
Confirmed Cases

4102
Deaths Cases

people fully vaccinated by date



total vaccinations by location



Overview

Global

Global 2

Vaccinations

USA

USA_VAC

Q&A



USA - Vaccination

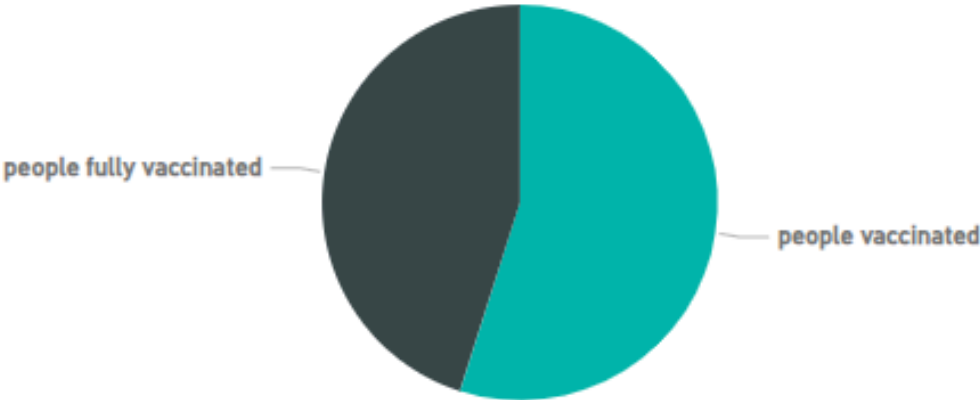


USA Vaccinations

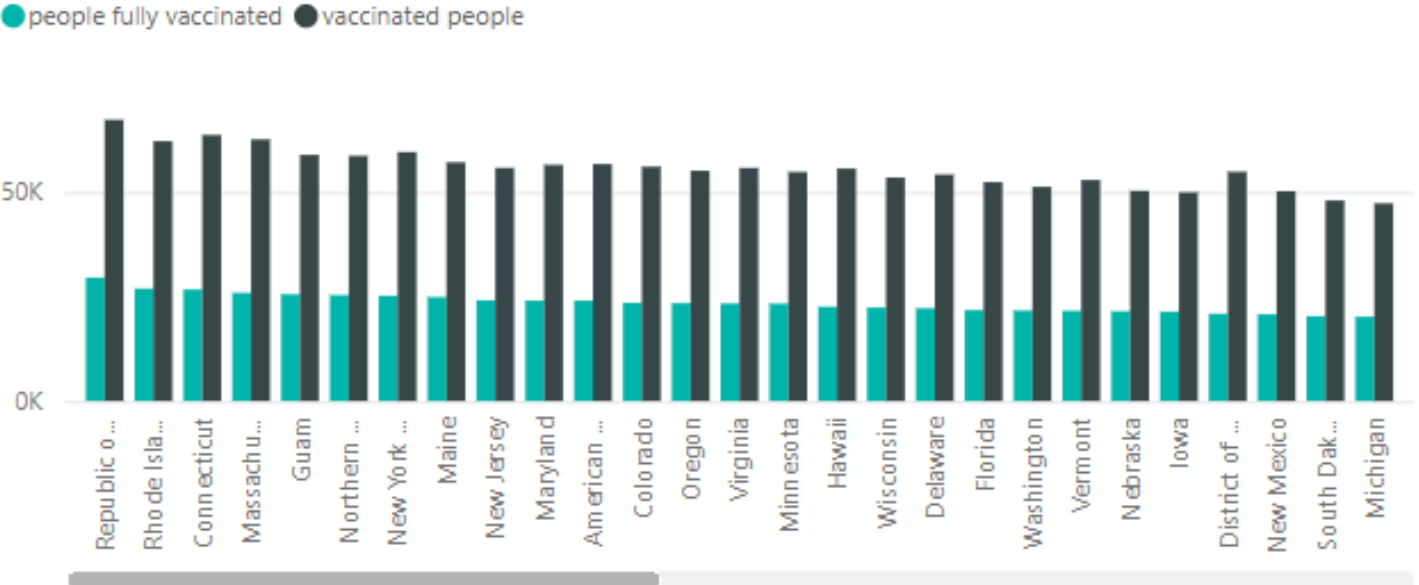
daily vaccinations by State



people vaccinated and people fully vaccinated



people fully vaccinated and vaccinated people by location



Overview

Global

Global 2

Vaccinations

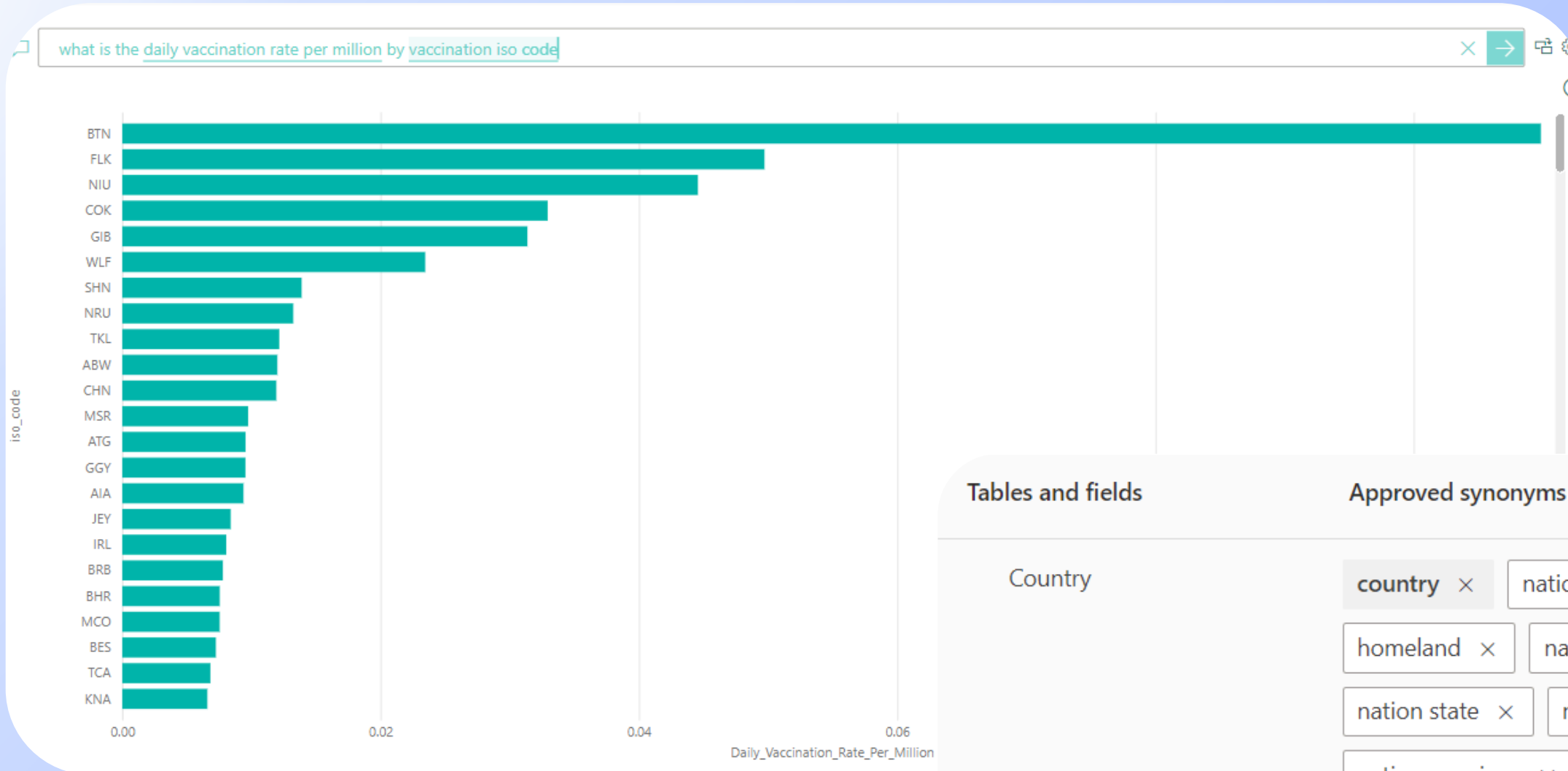
USA

USA_VAC

Q&A



Q&A



Tables and fields

Country

Approved synonyms

country ×

nation ×

realm ×

homeland ×

nation-state ×

nation state ×

nation-location ×

nation-province ×

nation-territory ×

state ×

nation location ×

nation province ×

province ×

nation territory ×

nation-nation ×

nation-placement ×

nation-venue ×

nation locality ×

Suggestions

nation nation + ×

nation-scene + ×

nation scene + ×

nation-country + ×

nation-address + ×

+6

Include in Q&A

☒

Manage Security

Implementing Row-Level Security (RLS) Based on Country/Region

Division of Users by Country

To achieve this, I divided users based on the following countries/regions:

- India
- Japan
- Spain
- UK
- Ukraine

Each user role was created to restrict access to data from the respective country.

Example of Users and Role Assignment

I created example users for each country as follows:

- India Viewers: `ayman.said@ejust.edu.eg`
- Japan Viewers: `mohamed.abdelety@ejust.edu.eg`
- Spain Viewers: `youssef.bakir@ejust.edu.eg`
- UK Viewers: `youssef.fawzy@ejust.edu.eg`
- Ukraine Viewers: `mario.fam@ejust.edu.eg`

These users are now restricted to viewing data only from their respective countries.

Manage Security

Steps Taken to Implement RLS

Step 1: Creating Roles in Power BI Desktop

- Navigated to the Modeling tab and selected Manage Roles.
- Created a role for each country (India, Japan, Spain, UK, Ukraine).
- Applied DAX filters to each role to restrict the data based on the user's country.

Step 2: Testing the Roles

- I used the View as Role feature to simulate how the report looks for users in each role.
- Verified that each user role only sees the data specific to their assigned country.

Step 3: Publishing the Report to Power BI Service

- Published the report to Power BI Service.
- Configured the Security settings by assigning specific users to the relevant country roles.



Auto recovery contains some recovered files that haven't been opened.

View recovered files



- ☐ Azerbaijan
- ☐ ('St. Martin')
- ☐ Afghanistan
- ☐ Albania
- ☐ Algeria

- ☐ 2018
- ☐ 2019
- ☐ 2020
- ☐ 2021
- ☐ 2022

people > 70



2174

people 60:70



1367

people older than 70



19.13M

Total Vaccinations

166K

Deaths Cases

82

Recover

Total Cases By Country



View as roles

- ☒ None
- ☐ Other user
- ☐ India Viewers
- ☐ Japan Viewers
- ☐ Spain Viewers
- ☐ UK Viewers
- ☐ Ukraine Viewers

OK

Cancel

Overview

Global

Global 2

Vaccinations

USA

USA_VAC

Q&A



Search

Filters on this page



Add data fields here

Filters on all pages



Add data fields here

Confirmed
35K

Manage Security

Implementing Row-Level Security (RLS) Based on Country/Region

Benefits of Implementing RLS

- **Data Security:** Sensitive or irrelevant data is not exposed to unauthorized users.
- **Data Accuracy:** Users view only the data that is relevant to them, which reduces confusion and enhances decision-making.
- **Improved Performance:** By limiting data based on roles, report performance is optimized as users only load the data they need.

Dashboard

