**PowerBI Project: Covid – 19 Dashboard**

**Project description:**

Build a suitable Dashboard, to analyse and get insights from the data given.

Choose the visualizations wisely for the type of column and purpose of the chart / graph.

Create reports to perform the below analysis:

**Q1. How has the number of COVID-19 cases and deaths evolved over time in different**

**regions?**

To show how the number of **COVID-19 cases and deaths** has evolved over time in different **WHO regions** using a **Pie Chart** in Power BI, follow these steps:

**Steps to Create a Pie Chart to Show Cases and Deaths by Region:**

**1. Ensure You Have the Required Data**

* Your table should already have columns like Date\_reported, WHO\_region, New\_cases, Cumulative\_cases, New\_deaths, and Cumulative\_deaths.
* The analysis will focus on **WHO\_region** and the **Total Cumulative Cases** or **Total Cumulative Deaths**.

**2. Create the Necessary Measures (if needed)**

* If you don't have measures for **Total Cumulative Cases** and **Total Cumulative Deaths**, create them using DAX.

**For Total Cumulative Cases**:

DAX

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TotalCumulativeCases = SUM('Table'[Cumulative\_cases])

**For Total Cumulative Deaths**:

DAX

Copy code

TotalCumulativeDeaths = SUM('Table'[Cumulative\_deaths])

**3. Insert a Pie Chart Visual**

* In **Report View**, go to the **Visualizations** pane and select the **Pie Chart** visual.

**4. Configure the Pie Chart for COVID-19 Data**

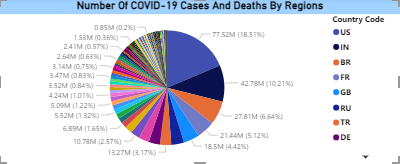
* **Legend**: Drag the WHO\_region field into the **Legend** section. This will categorize the pie chart slices by different regions.
* **Values**: Drag the **TotalCumulativeCases** or **TotalCumulativeDeaths** measure into the **Values** section to display the number of cases or deaths for each region.

**5. Visualize Cases and Deaths in Separate Pie Charts (Optional)**

* You can create two separate pie charts:
  + One for **Cumulative Cases**.
  + One for **Cumulative Deaths**.
* Use **WHO\_region** in the **Legend** for both charts, and use **TotalCumulativeCases** in one and **TotalCumulativeDeaths** in the other for the **Values**.

**6. Customize the Pie Chart (Optional)**

* Go to the **Format** pane to change the appearance:
  + **Data labels**: Turn on data labels to display the total number of cases or deaths within each region slice.
  + **Colors**: You can change the colors of each region for better distinction.



**Q2. Are there any noticeable patterns or trends in the data, such as spikes or declines in**

**cases?**

To identify noticeable patterns or trends, such as spikes or declines in COVID-19 cases, you can use a Stacked Area Chart in Power BI. This visualization will help you analyze the data over time, showing the evolution of cases in different regions and highlighting periods of increases or decreases.

Steps to Create a Stacked Area Chart to Show Trends in Cases:

1. Ensure You Have the Required Data

Your table should already have the following columns:

* Date\_reported
* WHO\_region
* New\_cases or Cumulative\_cases (for tracking spikes and trends)

2. Insert a Stacked Area Chart

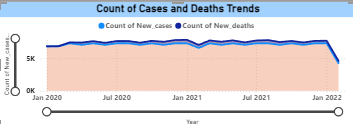
* In Report View, go to the Visualizations pane and select the Stacked Area Chart visual.

3. Configure the Stacked Area Chart

* X-Axis: Drag Date\_reported to the X-Axis field to show cases over time.
* Y-Axis: Drag New\_cases (or Cumulative\_cases if you want to show cumulative trends) to the Y-Axis field.
* Legend: Drag WHO\_region to the Legend section to stack the areas by region. This will display the contribution of each region to the overall trend.

4. Customize the Stacked Area Chart (Optional)

* Time Granularity: If the data is daily, but you want to analyze trends weekly or monthly, use Date hierarchies. Right-click on the Date\_reported in the X-Axis field and select Drill Down options (e.g., Week, Month).
* Colors: Go to the Format pane and adjust the colors for each region to better distinguish the areas.
* Data Labels: You can turn on data labels for more detail, but this may clutter the chart. Use it only if necessary**.**

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**Q3. Plot weekly moving average of the cases and deaths.**

To plot the **weekly moving average** of COVID-19 **cases and deaths** using an **Area Chart** in Power BI, follow these steps:

**Steps to Create a Weekly Moving Average Area Chart for Cases and Deaths:**

**1. Ensure You Have the Required Data**

Your dataset should have the following columns:

* Date\_reported
* New\_cases
* New\_deaths

**2. Create Measures for Weekly Moving Averages**

To calculate the **7-day (weekly) moving average** for new cases and deaths, use the following DAX formulas.

* **Weekly Moving Average for New Cases**:

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WeeklyMovingAvgCases =

AVERAGEX(

DATESINPERIOD(

'Table'[Date\_reported],

LASTDATE('Table'[Date\_reported]),

-7,

DAY

),

'Table'[New\_cases]

)

* **Weekly Moving Average for New Deaths**:

DAX

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WeeklyMovingAvgDeaths =

AVERAGEX(

DATESINPERIOD(

'Table'[Date\_reported],

LASTDATE('Table'[Date\_reported]),

-7,

DAY

),

'Table'[New\_deaths]

)

These measures calculate the 7-day average by looking back over the last 7 days from each date.

**3. Insert an Area Chart**

* In **Report View**, go to the **Visualizations pane** and select the **Area Chart** visual.

**4. Configure the Area Chart**

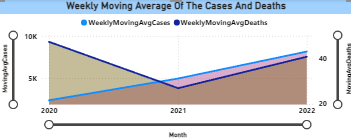
* **X-Axis**: Drag Date\_reported to the **X-Axis** to represent time.
* **Y-Axis**: Drag the WeeklyMovingAvgCases measure to the **Y-Axis** to plot the weekly moving average of cases.
* **Legend**: If you want to split the chart by different regions or countries, drag WHO\_region or Country to the **Legend** field. This will create separate lines/areas for each region or country.

**5. Create a Second Area Chart for Deaths (Optional)**

* If you want to visualize the weekly moving average of deaths separately, repeat the above steps but use the WeeklyMovingAvgDeaths measure instead of the cases.
* Alternatively, you can add both the **WeeklyMovingAvgCases** and **WeeklyMovingAvgDeaths** measures to the **Y-Axis** of a single chart, using different colors to differentiate between them.

**6. Customize the Chart (Optional)**

* **Time Granularity**: If needed, right-click the Date\_reported field on the X-Axis and choose **Drill Down** to change the date hierarchy to a more specific level (day, week, month).
* **Format the Chart**: Go to the **Format pane** to customize colors, data labels, and other formatting options for the area chart.



**Q4. Plot country wise cases count.**

To **plot country-wise COVID-19 case counts** using a **Stacked Bar Chart** in Power BI, follow these steps:

**Steps to Create a Stacked Bar Chart for Country-wise Case Count:**

**1. Ensure You Have the Required Data**

The dataset should have the following columns:

* Country
* New\_cases (for new case counts) or Cumulative\_cases (for total case counts)

**2. Insert a Stacked Bar Chart**

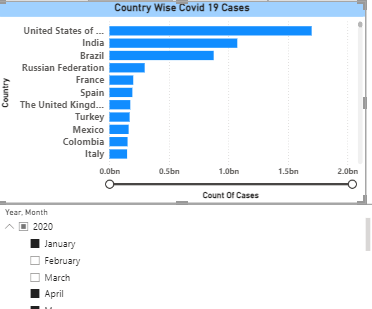
* In **Report View**, go to the **Visualizations pane** and select the **Stacked Bar Chart** visual.

**3. Configure the Stacked Bar Chart**

* **Axis**: Drag the Country column to the **Axis** field. This will categorize the bars by each country.
* **Values**: Drag the New\_cases (if you want to visualize new cases) or Cumulative\_cases (if you want to visualize total cases) to the **Values** field. This will determine the length of the bars based on the case count for each country.
* **Legend**: If you want to further break down the data (e.g., by WHO\_region), you can drag the WHO\_region column into the **Legend** field. This will stack the bars by region within each country.

**4. Customize the Chart (Optional)**

* **Sort the Data**: Click on the **three dots** in the top-right corner of the chart and select **Sort by Cumulative\_cases** (or New\_cases) to display the countries with the highest cases at the top or bottom.
* **Colors**: Go to the **Format pane** to change the color scheme of the stacked bars, if needed.
* **Data Labels**: Turn on **data labels** in the **Format pane** to display the exact case counts on each bar.



**Q5. Add a monthly filter to the above plot.**

To add a **monthly filter** to the country-wise **stacked bar chart** in Power BI, you can use a **Date Slicer**. This will allow you to filter the chart data by specific months, showing only the COVID-19 case counts for the selected month(s).

**Steps to Add a Monthly Filter to the Country-wise Cases Plot:**

**1. Ensure Your Data Has Date Information**

Your dataset should have a Date\_reported column that contains the date of the reported cases.

**2. Insert a Date Slicer**

* In **Report View**, go to the **Visualizations pane** and select the **Slicer** visual.
* Drag the Date\_reported field from your data into the **Slicer**.

**3. Configure the Slicer for Monthly Filtering**

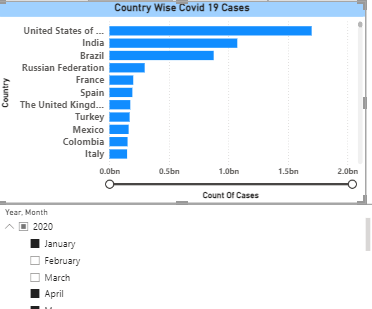
* Once the slicer is added, click the drop-down arrow on the slicer (usually in the top-right corner of the slicer).
* Choose **Date Hierarchy** if it's not already applied, and then set the hierarchy to **Month** and **Year**.
* This will allow you to filter the data by months and years in the slicer.

**4. Sync the Slicer with the Stacked Bar Chart**

* The slicer should automatically filter the stacked bar chart since it’s based on the same dataset.
* By selecting specific months (or a range of months) in the slicer, the stacked bar chart will update to show only the case counts for that period.

**5. Customize the Slicer (Optional)**

* Go to the **Format pane** (paint roller icon) to customize the appearance of the slicer:
  + **Orientation**: You can set it to **Horizontal** or **Vertical** depending on your dashboard layout.
  + **Date Input**: Choose whether you want a **slider** or a **dropdown list** for month selection.
  + **Formatting**: Customize the colors and fonts of the slicer to match your report theme.



OR

A graph of covid-19 cases

Description automatically generated

**Q6. Create a map chart to visualize the intensity of covid cases.**

To create a **Map Chart** in Power BI to visualize the **intensity of COVID-19 cases** across countries, follow these steps:

**Steps to Create a Map Chart for Visualizing COVID-19 Case Intensity:**

**1. Ensure You Have the Required Data**

The dataset should contain the following columns:

* Country (or Country\_code)
* Cumulative\_cases (for total case counts) or New\_cases (for new daily case counts)
* Latitude and Longitude (optional, but helpful for more accurate mapping)

**2. Insert a Map Chart**

* In **Report View**, go to the **Visualizations pane** and select the **Map** visual (represented by a globe icon).

**3. Configure the Map Chart**

* **Location**: Drag the Country (or Country\_code) field to the **Location** field. Power BI will plot points on the map based on country names or codes.
* **Size**: Drag the Cumulative\_cases (or New\_cases) field to the **Size** field. This will control the size of the circles on the map, where larger circles represent higher case counts.
* **Color Saturation**: Drag the Cumulative\_cases or New\_cases field to the **Color Saturation** field to differentiate case intensity using color. Higher case counts will have darker or more intense colors.

**4. Optional: Add WHO Region to the Legend**

* If you want to categorize the data by **WHO\_region**, drag the WHO\_region field to the **Legend** section. This will assign different colors to each region on the map, making it easier to see which regions are more affected.

**5. Customize the Map Chart (Optional)**

* Go to the **Format pane** (paint roller icon) to make additional customizations:
  + **Map Style**: You can change the map theme (e.g., Dark, Light, Grayscale).
  + **Bubbles**: Adjust the size of the bubbles to ensure they are properly visible for all countries.
  + **Data Labels**: Enable data labels if you want to show case numbers directly on the map.

**6. Filter the Data (Optional)**

* You can add a **date slicer** or **region filter** to focus on specific time periods or regions. For example, you could filter the map to show case intensity for a specific month or for a particular WHO region.

**Example Output for a Map Chart:**

* **Bubbles** of different sizes will appear on the map, representing countries.
* **Larger bubbles** indicate countries with higher case counts, and smaller bubbles indicate countries with fewer cases.
* **Color intensity** can be used to differentiate between countries with high and low case counts.

A map of the world with many colored circles

Description automatically generated

**Q7. Create a hierarchy of WHO region and Country.**

**To create a hierarchy of WHO region and Country in Power BI and visualize the data, follow these steps:**

**Steps to Create the Hierarchy**

1. **Open the Data View:**
   * **Go to the Data View in Power BI where you can see the table with the columns WHO\_region and Country.**
2. **Create a Hierarchy:**
   * **In the Fields pane, locate your table (e.g., Table).**
   * **Right-click on the WHO\_region field, and select New Hierarchy.**
     + **This will create a hierarchy with the WHO\_region as the top level.**
   * **Next, drag the Country field and drop it onto the newly created hierarchy (under the WHO\_region field).**
     + **Now, Country will become the second level of the hierarchy.**

**You now have a hierarchy where the WHO region is the parent, and Country is the child.**

**Visualizing the Hierarchy in a Power BI Report**

1. **Add a Visual:**
   * **Go to the Report View.**
   * **In the Visualizations pane, select a visual type. You can use a Matrix, Table, or Tree Map for hierarchical data visualization.**
2. **Add the Hierarchy to the Visual:**
   * **Drag the hierarchy you just created (from the Fields pane) into the Rows (or Values) section of the selected visual.**

**For example:**

* + **In a Matrix visual, place the hierarchy in the Rows section.**
  + **In a Tree Map, place the hierarchy in the Category section.**

1. **Expand the Hierarchy:**
   * **Once the hierarchy is in the visual, you can click on the expand/collapse icons (down arrows) to drill down into the countries under each WHO region.**

**Example of How to Set It Up:**

* **For a Matrix visual:**
  + **Rows: Add the WHO\_region > Country hierarchy.**
  + **Values: You can add fields like Cumulative\_cases or Cumulative\_deaths to display the metrics alongside the regions and countries.**

A screenshot of a computer

Description automatically generated

**Q8. Use the previous hierarchy and identify which WHO regions are most affected.**

To identify which **WHO regions** are most affected by COVID-19 using the **Matrix hierarchy** (WHO Region > Country), we will look at the **Total Cumulative Cases** and/or **Total Cumulative Deaths** within the **Matrix visual**. You can use this hierarchy to compare the impact across different regions and their respective countries.

**Steps to Create the Matrix Visual with Hierarchy and Identify the Most Affected Regions:**

**1. Ensure the Hierarchy Exists**

If you haven't already created a hierarchy, you can create a hierarchy of **WHO Region** and **Country**:

* In the **Fields** pane, right-click WHO\_region and select **New Hierarchy**.
* Drag Country into this hierarchy under **WHO\_region**.

**2. Create the Required Measures**

To identify the most affected regions, create DAX measures for:

* **Total Cumulative Cases**:

DAX

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TotalCumulativeCases = SUM('Table'[Cumulative\_cases])

* **Total Cumulative Deaths**:

DAX

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TotalCumulativeDeaths = SUM('Table'[Cumulative\_deaths])

**3. Add the Matrix Visual**

* Go to the **Report View** and from the **Visualizations** pane, select the **Matrix visual**.

**4. Add the Hierarchy to the Matrix**

* In the **Fields** pane, locate the hierarchy of WHO\_region > Country.
* Drag the hierarchy into the **Rows** field of the Matrix visual.

**5. Add the Measures to the Matrix**

* Drag the **TotalCumulativeCases** measure to the **Values** section of the Matrix.
* Optionally, add the **TotalCumulativeDeaths** measure alongside to view the cumulative deaths per region and country.

**6. Expand/Collapse Hierarchy**

* The Matrix will now display data grouped by **WHO Region** and **Country**. You can use the **expand/collapse** arrows to drill into the details:
  + **WHO Region** as the parent.
  + **Country** as the child, showing specific country-level data under each region.

**7. Identify the Most Affected Regions**

* **Sort the Matrix** by **Total Cumulative Cases** or **Total Cumulative Deaths** by clicking on the column header (e.g., TotalCumulativeCases) to see the most affected WHO regions at the top.
* The WHO regions with the highest total cases and deaths will appear at the top.

