

Creating visuals in Power BI

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# Introduction

Suppose we are working with the **Gender\_Egypt** dataset, which aggregates data on various **gender-related indicators in Egypt** over multiple years.

Our task is to use Power BI to **transform** this dataset **from its raw state to meaningful visuals**.

The task isn't just about making graphs; it's about **understanding the narrative that the data are trying to convey**, with Power BI as the storyteller.

File Home Help **Table tools**

Name: Gender\_Egypt

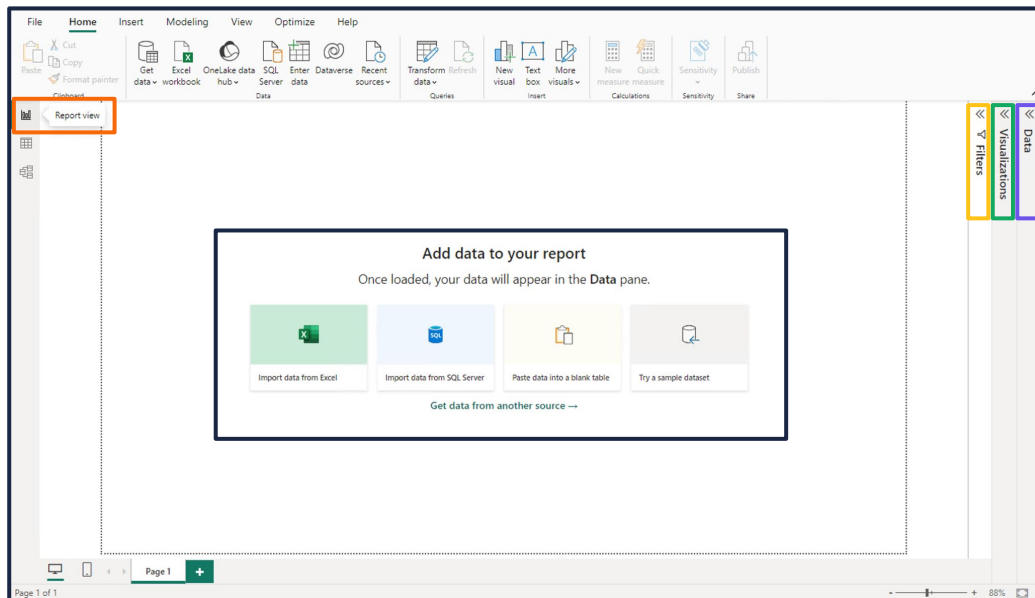
Structure

Table tools ribbon: Mark as date table, Manage relationships, New measure, Quick measure, New column, New table

Country_name	Country_ISO3	Year	Indicator_name	Indicator_code	Value
Egypt, Arab Rep.	EGY	1995	There are periods of absence due to childcare accounted for in pension benefits (1=yes; 0=no)	SG.ABS.PENB	0
Egypt, Arab Rep.	EGY	1994	There are periods of absence due to childcare accounted for in pension benefits (1=yes; 0=no)	SG.ABS.PENB	0
Egypt, Arab Rep.	EGY	1993	There are periods of absence due to childcare accounted for in pension benefits (1=yes; 0=no)	SG.ABS.PENB	0
Egypt, Arab Rep.	EGY	1992	There are periods of absence due to childcare accounted for in pension benefits (1=yes; 0=no)	SG.ABS.PENB	0
Egypt, Arab Rep.	EGY	1991	There are periods of absence due to childcare accounted for in pension benefits (1=yes; 0=no)	SG.ABS.PENB	0
Egypt, Arab Rep.	EGY	1990	There are periods of absence due to childcare accounted for in pension benefits (1=yes; 0=no)	SG.ABS.PENB	0
Egypt, Arab Rep.	EGY	1989	There are periods of absence due to childcare accounted for in pension benefits (1=yes; 0=no)	SG.ABS.PENB	0
Egypt, Arab Rep.	EGY	1988	There are periods of absence due to childcare accounted for in pension benefits (1=yes; 0=no)	SG.ABS.PENB	0
Egypt, Arab Rep.	EGY	1987	There are periods of absence due to childcare accounted for in pension benefits (1=yes; 0=no)	SG.ABS.PENB	0
Egypt, Arab Rep.	EGY	1986	There are periods of absence due to childcare accounted for in pension benefits (1=yes; 0=no)	SG.ABS.PENB	0
Egypt, Arab Rep.	EGY	1985	There are periods of absence due to childcare accounted for in pension benefits (1=yes; 0=no)	SG.ABS.PENB	0
Egypt, Arab Rep.	EGY	1984	There are periods of absence due to childcare accounted for in pension benefits (1=yes; 0=no)	SG.ABS.PENB	0
Egypt, Arab Rep.	EGY	1983	There are periods of absence due to childcare accounted for in pension benefits (1=yes; 0=no)	SG.ABS.PENB	0
Egypt, Arab Rep.	EGY	1982	There are periods of absence due to childcare accounted for in pension benefits (1=yes; 0=no)	SG.ABS.PENB	0
Egypt, Arab Rep.	EGY	1981	There are periods of absence due to childcare accounted for in pension benefits (1=yes; 0=no)	SG.ABS.PENB	0
Egypt, Arab Rep.	EGY	1980	There are periods of absence due to childcare accounted for in pension benefits (1=yes; 0=no)	SG.ABS.PENB	0
Egypt, Arab Rep.	EGY	1979	There are periods of absence due to childcare accounted for in pension benefits (1=yes; 0=no)	SG.ABS.PENB	0
Egypt, Arab Rep.	EGY	1978	There are periods of absence due to childcare accounted for in pension benefits (1=yes; 0=no)	SG.ABS.PENB	0
Egypt, Arab Rep.	EGY	1977	There are periods of absence due to childcare accounted for in pension benefits (1=yes; 0=no)	SG.ABS.PENB	0
Egypt, Arab Rep.	EGY	1976	There are periods of absence due to childcare accounted for in pension benefits (1=yes; 0=no)	SG.ABS.PENB	0
Egypt, Arab Rep.	EGY	1975	There are periods of absence due to childcare accounted for in pension benefits (1=yes; 0=no)	SG.ABS.PENB	0
Egypt, Arab Rep.	EGY	1974	There are periods of absence due to childcare accounted for in pension benefits (1=yes; 0=no)	SG.ABS.PENB	0
Egypt, Arab Rep.	EGY	1973	There are periods of absence due to childcare accounted for in pension benefits (1=yes; 0=no)	SG.ABS.PENB	0
Egypt, Arab Rep.	EGY	1972	There are periods of absence due to childcare accounted for in pension benefits (1=yes; 0=no)	SG.ABS.PENB	0
Egypt, Arab Rep.	EGY	1971	There are periods of absence due to childcare accounted for in pension benefits (1=yes; 0=no)	SG.ABS.PENB	0
Egypt, Arab Rep.	EGY	1970	There are periods of absence due to childcare accounted for in pension benefits (1=yes; 0=no)	SG.ABS.PENB	0
Egypt, Arab Rep.	EGY	2020	A woman can sign a contract in the same way as a man (1=yes; 0=no)	SG.CNT.SIGN.EQ	0
Egypt, Arab Rep.	EGY	2019	A woman can sign a contract in the same way as a man (1=yes; 0=no)	SG.CNT.SIGN.EQ	0
Egypt, Arab Rep.	EGY	2018	A woman can sign a contract in the same way as a man (1=yes; 0=no)	SG.CNT.SIGN.EQ	0

Table: Gender\_Egypt (6,392 rows)

# Power BI panes introduction



To create visualisations, we need to be in the **Report view**. This is the default view where we'll see various panes like;

1. **Data**
2. **Visualizations**
3. **Filters**

When we first launch Power BI, we encounter the **Report view** with a blank canvas that provides **links** to assist in **adding data to a report**.



1. Import the **Gender\_Egypt** dataset into Power BI.

Note: This icon indicates challenges that you should try solving by yourself before moving to the next slide deck.

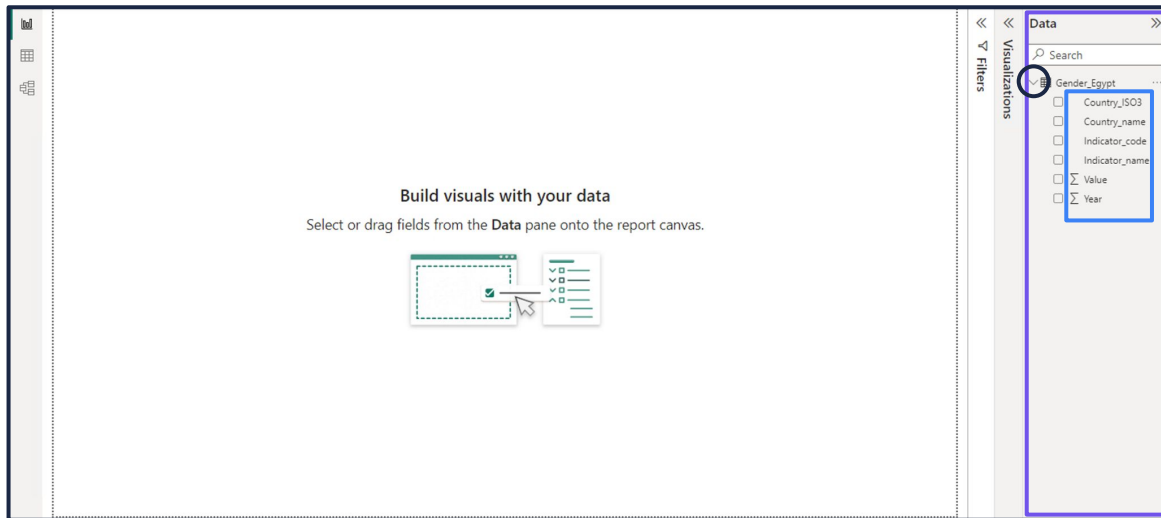
# Data pane

It is crucial to understand our data before visualising it.

The **Data pane** lets us explore the tables we've imported into Power BI.

A table can be expanded by clicking on the **arrow** next to the table's name.

This will provide access to all the **fields** in that table.



1. Drag the **Indicator\_name** field onto the page to start a new visualisation.
2. Drag the **Σ Value** field onto the existing visualisation to add it to that visualisation.



# Influence of data structure on visualisations

In Power BI, the structure of our data can determine the ease and type of visualisations we can create.

## Pivoted data

This is a data structure where related elements are **grouped** or **pivoted** into columns representing a particular category.

E.g. a dataset on literacy rates would feature separate `Male_literacy_rate` and `Female_literacy_rate` columns, each populated with relevant figures.

## Non-pivoted data

With this data structure, related data elements are **stacked in one column** instead of being spread across multiple columns.

E.g. having a single `Indicator` column with rows specifying *Literacy Rate, Male* and *Literacy Rate, Female*, rather than separate columns for each.



Power BI offers a flexible environment to transform and visualise data effectively, despite the underlying data structure. This versatility effectively allows users to **focus more on insights and storytelling**.

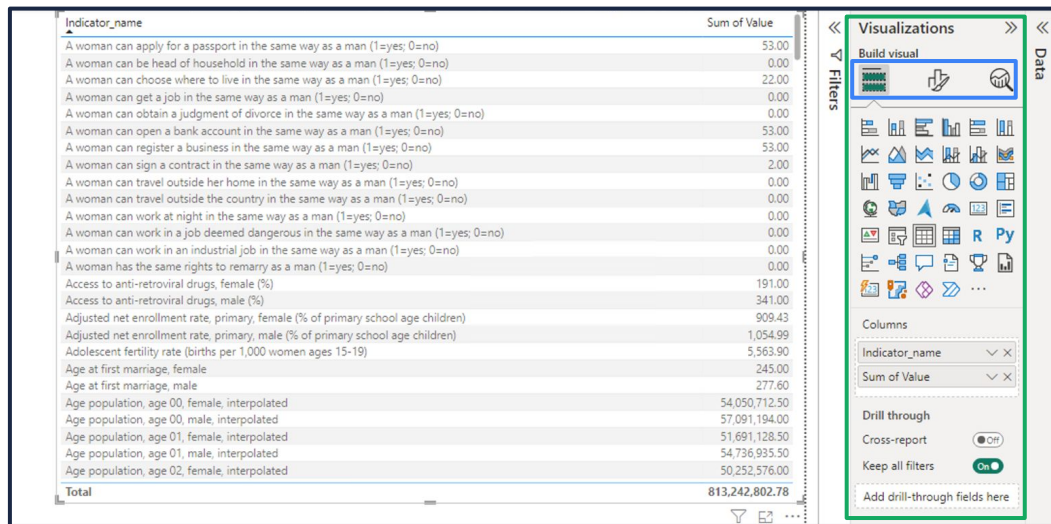
# Visualizations pane

Power BI provides a diverse range of **visualisation types**, enabling users to create **visually engaging and interactive** dashboards and reports.

The **Visualizations pane** provides the **primary interface for creating and formatting visuals**.

It includes three tabs:

- **Build visual**
- **Format**
- **Analytics**



1. **Identify the type of visualisation** in the image above.
2. **Identify this visualisation's icon** on the Build visual sub-pane.



# Visualizations pane

The screenshot shows the Power BI interface. On the left, a table visual displays data with two columns: 'Indicator\_name' and 'Sum of Value'. The table lists various indicators related to women's rights and health, such as 'A woman can apply for a passport in the same way as a man' and 'Access to anti-retroviral drugs, female (%)'. The 'Sum of Value' column shows numerical values for each indicator. On the right, the 'Visualizations' pane is open, showing the 'Build visual' tab. The 'Table' icon is highlighted with a green box. Below the icons, the 'Columns' section shows 'Indicator\_name' and 'Sum of Value' selected. The 'Drill through' section has a 'Cross-report' toggle set to 'Off' and a 'Keep all filters' toggle set to 'On'.

Indicator_name	Sum of Value
A woman can apply for a passport in the same way as a man (1=yes; 0=no)	53.00
A woman can be head of household in the same way as a man (1=yes; 0=no)	0.00
A woman can choose where to live in the same way as a man (1=yes; 0=no)	22.00
A woman can get a job in the same way as a man (1=yes; 0=no)	0.00
A woman can obtain a judgment of divorce in the same way as a man (1=yes; 0=no)	0.00
A woman can open a bank account in the same way as a man (1=yes; 0=no)	53.00
A woman can register a business in the same way as a man (1=yes; 0=no)	53.00
A woman can sign a contract in the same way as a man (1=yes; 0=no)	2.00
A woman can travel outside her home in the same way as a man (1=yes; 0=no)	0.00
A woman can travel outside the country in the same way as a man (1=yes; 0=no)	0.00
A woman can work at night in the same way as a man (1=yes; 0=no)	0.00
A woman can work in a job deemed dangerous in the same way as a man (1=yes; 0=no)	0.00
A woman can work in an industrial job in the same way as a man (1=yes; 0=no)	0.00
A woman has the same rights to remarry as a man (1=yes; 0=no)	0.00
Access to anti-retroviral drugs, female (%)	191.00
Access to anti-retroviral drugs, male (%)	341.00
Adjusted net enrollment rate, primary, female (% of primary school age children)	909.43
Adjusted net enrollment rate, primary, male (% of primary school age children)	1,054.99
Adolescent fertility rate (births per 1,000 women ages 15-19)	5,563.90
Age at first marriage, female	245.00
Age at first marriage, male	277.60
Age population, age 00, female, interpolated	54,050,712.50
Age population, age 00, male, interpolated	57,091,194.00
Age population, age 01, female, interpolated	51,691,128.50
Age population, age 01, male, interpolated	54,736,935.50
Age population, age 02, female, interpolated	50,252,576.00
<b>Total</b>	<b>813,242,802.78</b>

By dragging the Indicator\_name and Value features onto the canvas, a **tabular visual** is created. When selected, the visual **icon** is highlighted on the **Build visual** tab.

When we hover over an icon, a **pop-up** with the name of the type of visualisation appears.



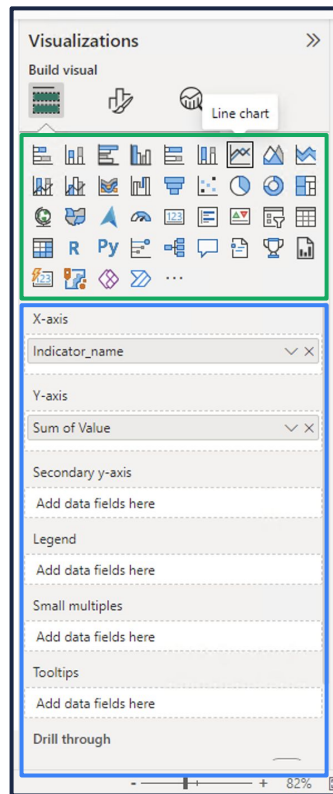
Explore the different types of visuals. What happens in the **Data pane** when we convert the visualisation from one form to another?

Also note that a third tab, the **Analytics tab**, only appears when a visual is selected.

Visuals

When we convert the visualisation from one form to

# Visualizations pane: Build visual tab



The Build visual tab is divided into two sections:

The **upper section** is where the visualisation type is chosen. If we start building a visualisation by selecting fields without selecting a visualisation type first, Power BI picks the visualisation type for us. We can keep Power BI's selection or change the type by selecting a different icon.

The **lower section** holds **buckets/wells** which vary depending on the type of visualisation selected. For example, if we've selected a **Line chart**, we see *Y-axis*, *X-axis*, *Legend*, etc. Some buckets are limited to certain types of data. For example, *Values* don't accept non-numeric fields.

1. Convert the visual into a **line chart**.
2. Add the **Year** field to the **Secondary y-axis** well.



**HINT:** Data can be added by dropping it on the page, visualisation, or on a specific well.



# Visualizations pane: Format visual tab

Once we've decided on a type of visual, we need to ensure that it **communicates effectively**, and much of this is achieved through formatting. Proper formatting ensures that visuals are not just **informative** but also **engaging and aligned** with the intended narrative or branding.

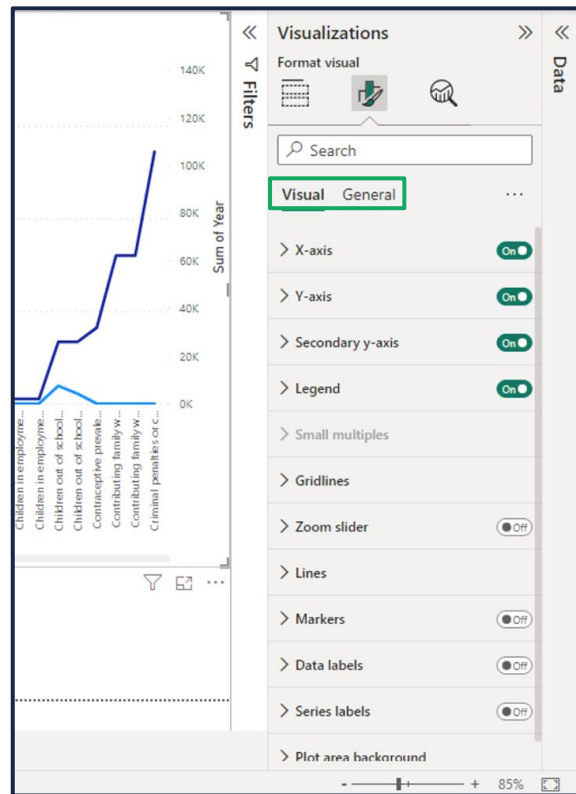
Formatting options can be divided into two main categories:

## Visual

This section pertains to a **specific visual**. Each visual type has its unique set of formatting options tailored to its design and function.

## General

These options are more about the **general appearance and behaviour** of the visual within the Power BI report canvas, and they apply consistently across different visual types.



# Visualizations pane: Analytics tab



The **Analytics tab** offers additional ways to **add analytical layers over our basic visualisations**. These tools provide added elements that give more context or insight without having to change the core data points. For example, we can:

1. Enhance charts by **inserting lines** that show statistical benchmarks like averages or extremes.
2. Visualise common ranges or deviations by **drawing bands** between two statistical values.
3. **Project future trends** from time-series data for insights into areas such as sales or inventory.
4. Uncover hidden data patterns or segments through **clustering**, enhancing interpretation and strategy.

The **options available in the Analytics tab depend on the type of visualisation we're working with**, as some analytical enhancements only make sense with certain types of data representations.

# Filters pane

The Filters pane allows us to **limit the data displayed based on specific criteria**. This makes it easier to get insights since we can focus on a specific portion of data. There are two types of filters:

## Filters on visuals

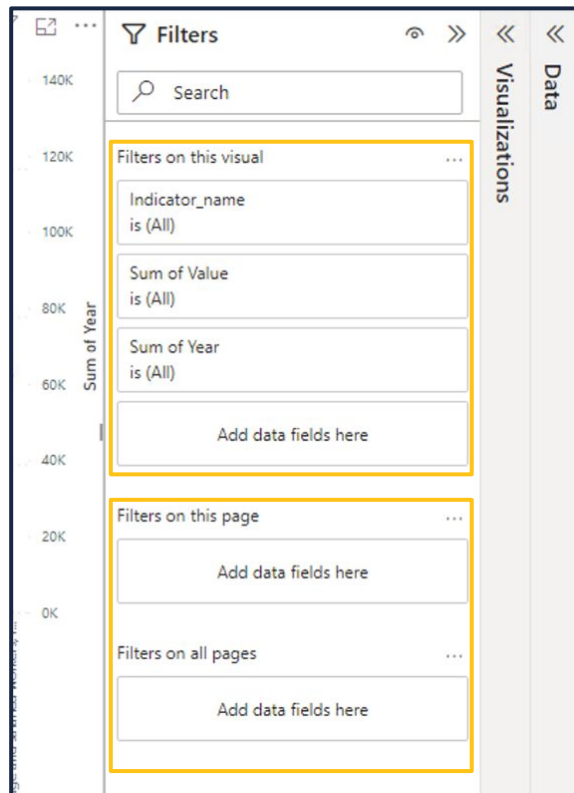
These are filters that are applied directly to **a single visual** on your report. They allow for a micro view, affecting only the data represented in one visual element.

## Filters on pages

These are filters that affect **all the visuals** present on a single report page. They are more macro-oriented, offering a broader data-filtering scope.



Create a filter for **Sum of Year** such that our line chart only displays data from 2014 to 2017, inclusive.



# Filters pane: Filter options

The Filters pane provides **various options** to help control and refine the data that appear in reports. Here's a breakdown of the primary filter options available:

## Basic filters:

Often checkbox-based, these allow us to select which values to include or exclude.

## Advanced filters (conditions):

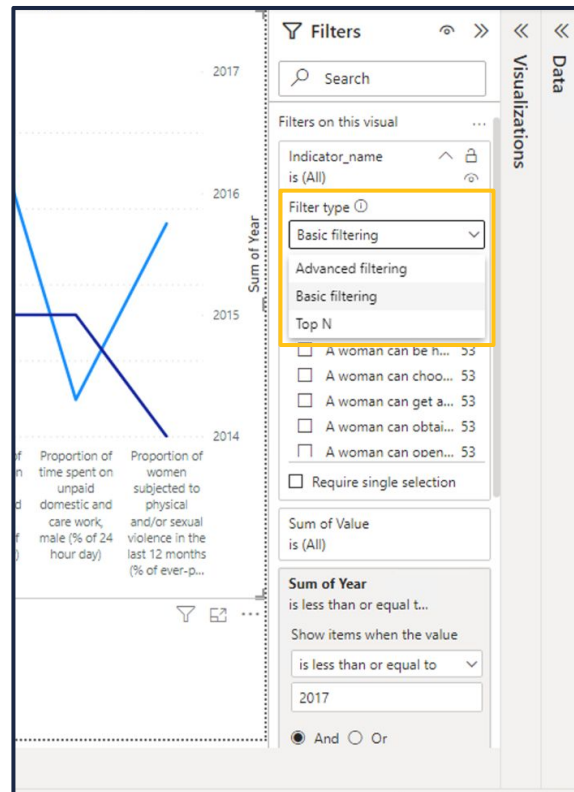
These apply conditions to refine results, essential for precise numerical data filtering.

## Top N filters:

These limit the data to the top 'N' items based on a specific metric, which is useful in rankings and leaderboards.

## Relative filters:

For date/time data, these filters show data relative to the current date (for example, last 7 days, next 3 months, etc.).



# Types of visualisations: Tables

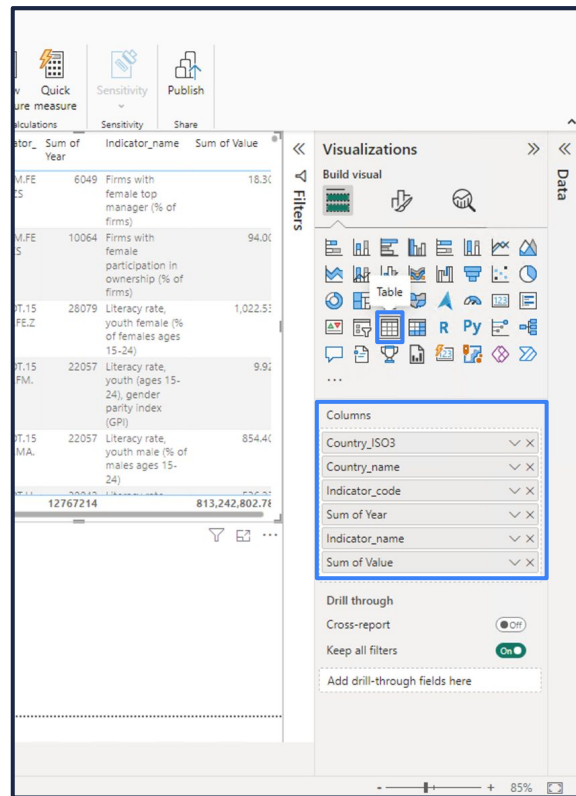
**Functionality:** Tables in Power BI allow for a **detailed data view** in a structured format, presenting information in **rows and columns** similar to spreadsheets. They are essential for displaying numerous variables at once or when specific figures are required.

**Complex data representation:** Tables in Power BI efficiently **distill complex data**, allowing precise value comparison and preventing misrepresentation common in more intricate visuals.

**Pre-visualisation assessment:** Before delving into more complex visualisations, tables offer a **preliminary view** of raw data, aiding analysts in grasping dataset nuances crucial for selecting suitable visuals.

## Well options:

**Columns:** These will be the columns in the table. Data for a particular column can be aggregated by expanding on the column name.

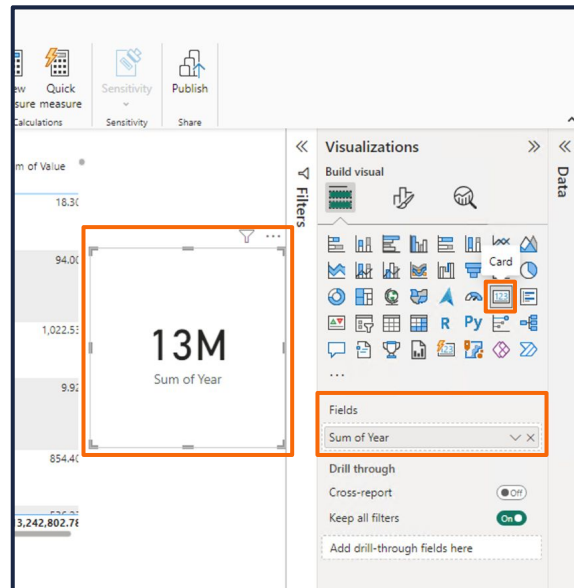


# Types of visualisations: Cards

**Functionality:** Cards display a **single value** in a large font and are often used to **highlight a key figure**, like total sales or average cost. They are **less detailed** but excellent for drawing attention to priority data.

**Simplicity and focus:** Unlike tables, cards are **not for complex representation**. Instead, they draw **focus to one particular element**, ensuring that this insight doesn't get lost amidst more complex data.

**Well options:**  
**Fields:** The data field to be showcased.



1. On a blank canvas, create a table that **displays all the data in the Gender\_Egypt** dataset.
2. Create a card that displays the value of **Sum of Year**.

# Types of visualisations: Tables and cards

Tables and cards serve distinctive purposes in data analysis and reporting within Power BI. However, **when used together, they are powerful tools** for:

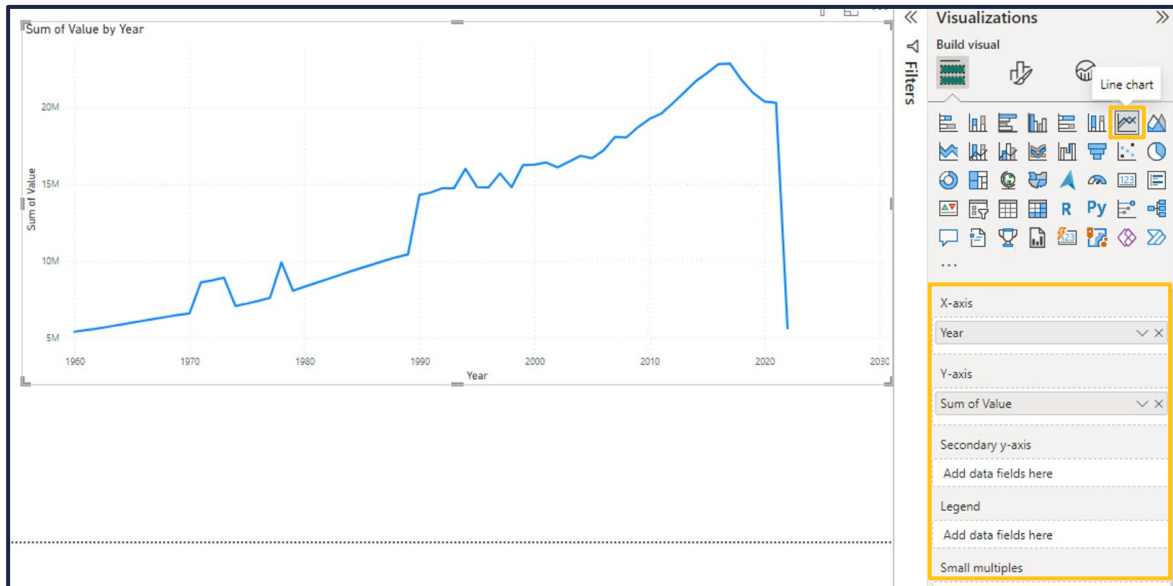
**Comprehensive reports:** When assembling a full report, tables and cards play different but complementary roles. While **tables can provide the detailed backdrop** of the data being analysed, **cards can serve to highlight the key takeaways** or figures that warrant immediate attention.

**Dashboards:** **Cards can provide at-a-glance insights** due to their straightforward nature, often serving as the summary or headline of the data's story. In contrast, **tables are there for when there is a need to drill down into the specifics** or to investigate detailed figures.

**Decision-making process:** Both tables and cards work together to ensure decision-makers have access to both the **macro and micro aspects of the data**. While cards can quickly convey critical data, tables ensure that there is a comprehensive understanding of the underlying details, thus ensuring well-informed decisions.

# Types of visualisations: Line charts

Line charts are ideal for displaying **continuous data**, for example, data trends over a period. They connect individual data points in a view, providing a clear **visualisation of trends or changes**.



## Well options:

**X-axis:** Data elements displayed on the horizontal axis.

**Y-axis:** Data elements displayed on the vertical axis.

**Secondary y-axis:** Second vertical axis to display additional data for comparison.

**Legend:** Differentiates data categories through colour-coding.

**Small multiples:** Enables the creation of comparable, individual mini-charts based on categorical divisions.

**Tooltips:** Provides more context when hovering over specific sections of a visual.



# Types of visualisations: Column charts

Column charts are perfect for **comparing values across categories shown as bars**. They are best used with multiple data series and where highlighting relative proportions is necessary.

## Well options:

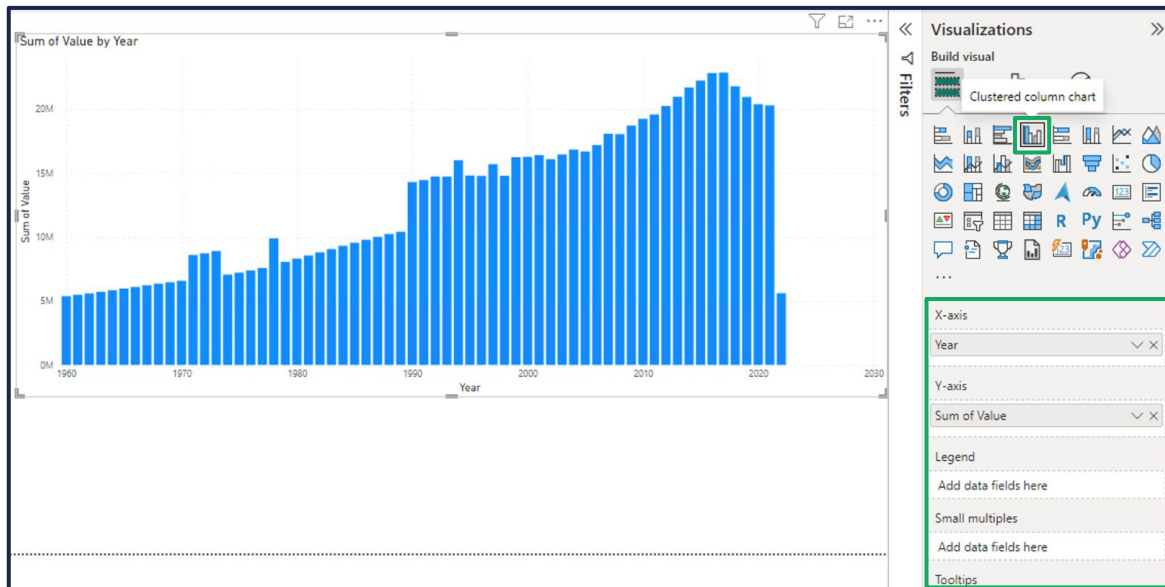
X-axis

Y-axis

Legend

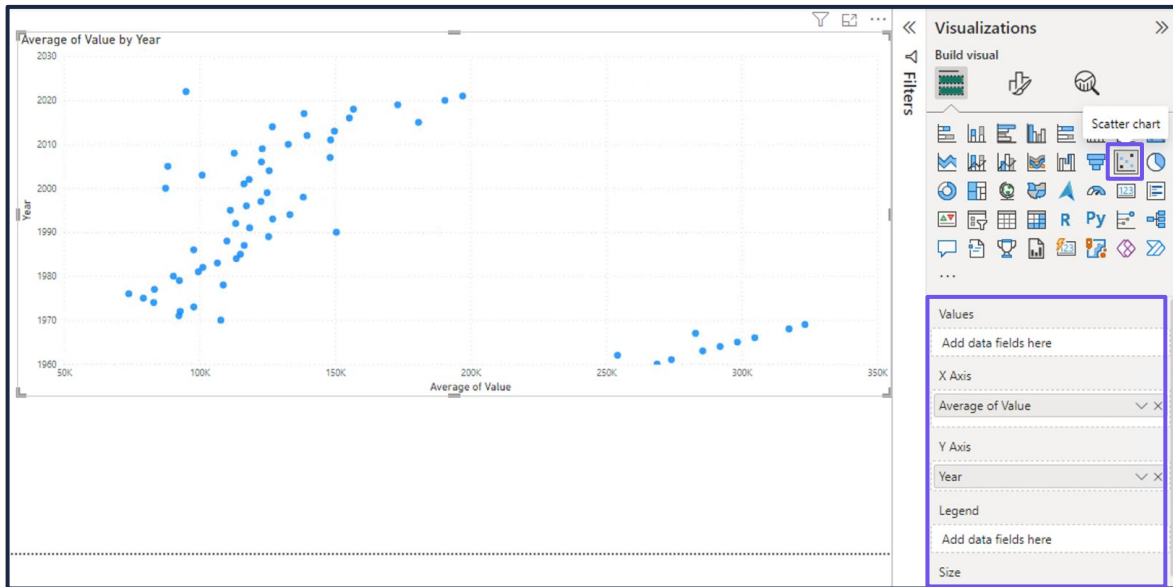
Small multiples

Tooltips



# Types of visualisations: Scatter plots

Scatter plots allow the **display of correlations between two numerical variables**, each point representing an observation. They are great for identifying **trends**, **concentrations**, and **outliers** within data.



## Well options:

**Value:** The main numerical data to be analysed or visualised.

**X-axis**

**Y-axis**

**Legend**

**Size:** Determines the dimension of a data point based on a quantitative measure.

**Play axis:** Introduces a time-based animation on data evolution over time.

**Tooltips**

# Types of visualisations: Treemaps

Treemaps **display data in nested rectangles**. Each level of this layout hierarchy is represented by a coloured rectangle (**branch**) containing other rectangles (**leaves**). They are useful for viewing proportions and hierarchies.

## Well options:

**Category:** A rectangle of relative size is created for each value in this field.

**Details:** Used to drill down into more specific elements within a broader category.

**Values**

**Tooltips**

