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Analytics Challenge  
for Aalto & UTU

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# Overview of the UNICEF Analytics Challenge

Fasten your seat belts!



The UNICEF State of the World's Children (SOCW) 2023 report has revealed concerning trends in child well-being and development across the globe. While progress has been made in various areas, there are persistent challenges that need urgent attention. As part of a collaborative effort with UNICEF, your task is to analyze the data provided in report to uncover key insights and highlight the top challenges faced by children.

Your team will be provided with the data from the latest UNICEF report and additional external metrics, which includes data on various indicators such as child mortality rates, access to education, healthcare services, nutrition, and protection from violence and exploitation.

You will present your findings and reasoning behind on selected insights to a panel comprising representatives from UNICEF and data & analytics specialists.



# Detailed Requirements

Please read carefully to understand the task

The aim of this project is to produce data insights that help UNICEF to highlight the challenges world's children are having. UNICEF's ask is to

1. Visualize what life looks like for children under 5 years old in the world today? What is/are the biggest direct or indirect challenge(s) the children face today?
2. Choose and focus on the top challenge(s) and highlight the issues affecting it. Make a country level analysis of the challenge(s). Are these focused on certain areas of the world, specific a group of countries or are these a global phenomena?

You may choose the viewpoints yourself, but you will find some suggestions from the following page.

Finally, the teams should be prepared to answer questions relating to the data and produced insights during the live UNICEF Analytics Challenge final.



# Examples of the Country-level Analysis

You may choose the focus area yourself, but...

When making initial assessment on the challenge(s), here are some sample questions you can think about:

- What are the biggest effects of climate change on children?
- What positive developments do you see?
- What is the biggest threat to children in 5 years?
- Why are the main reason children cannot make it to school?

Here are some sample comparisons to consider for the analysis:

- Vaccines vs. child deaths
- Girls education vs. child marriages
- Climate crisis vs. poverty
- Education vs. population growth

# Available Assets

Take advantage of everything you have!

This Tableau Analytics Challenge presentation

In Tableau Cloud - environment

- **UNICEF** - project
- **UNICEF SOWC2023 Country** and **UNICEF SOWC2023 Region** data sources
- **UNICEF SOWC2023 Template Workbook** - [Make copy of this workbook](#) into your own team folder.
- [Use team projects in Tableau Cloud to collaborate with your team members](#) and store your data visualizations / dashboards

**Note** - Available data is real data. The data quality is not perfect and data preparation might have introduced some new data issues. Have fun and good luck!

Please see [helpful resources](#) section for quick recap on how to use Tableau. How to build engaging dashboards and more.





# Helpful Resources

Take advantage of everything you have!

Get inspired by what our **#datafam** community is creating every day with Tableau

- Discover great content on Tableau Public: <https://public.tableau.com/app/discover>

Get to grip with the fundamentals of Tableau

- Watch Free training Videos - [Getting Started \(9 videos\)](#)

Master key concepts about dimensions, measures and continuous and discrete fields in order to understand what is happening behind the scenes when you interact with data.

- Watch [this video](#) or review documentation: [Dimensions and Measures, Blue and Green](#)

Tableau Blog - Data Visualization Tips For More Effective And Engaging Design - [LINK](#)

Tableau Whitepaper - 10 Best Practices for Building Effective Dashboards - [LINK](#)

Tableau Help - Choose the Right Chart Type for Your Data - [LINK](#)





# About SOWC Data

Just when you thought this is going to be easy

UNICEF Analytics Challenge is based on the open SOWC data provided by UNICEF - [LINK](#)

The Excel document has topic specific metric definitions and notes at the end of each worksheet. Use this information to understand the metric better.

There are **two SOWC** data sources. One on Country level and one on UNICEF Region level.

## IMPORTANT!!

1. There is a significant amount of **missing metrics data** in the SOWC report due to difficulties of obtaining the accurate data or calculating aggregate data. Work with the remaining values.
2. Majority of the metrics are percentages or ratios (e.g. x in 1000 children). Please note that **aggregating these ratios (to e.g. region level) will result to incorrect results** as we don't have original values used to calculate the ratio in our data set.

Please check the [Appendix](#) for more information

# Tableau Analytics Challenge Timeline

Are you prepared for 14 days of analytics fun?



| Challenge Release  | Return Video  | Select Finalists  | Challenge Final   |
|--|---|---|---|
| <p><b>Tue 9.4 at 9:00</b><br/><b>Day 0</b></p> <p>Teams receive analytics challenge materials</p> <p>Teams can start working on the challenge.</p> | <p><b>Fri 19.4 at 13:00</b><br/><b>Day 10</b></p> <p>Teams return 3 minute video where they pitch most important insights made from challenge data.</p> <p>Insights must be backed with data.</p> | <p><b>Sat 20.4 at 13:00</b><br/><b>Day 12</b></p> <p>Aalto &amp; UTU lecturers both select best 5 teams to compete in challenge final held on Tuesday 23.4.</p> <p>Finalists are notified</p> | <p><b>Tue 23.4 at 10-13</b><br/><b>Day 14</b></p> <p>Live final in Otaniemi Campus. Each Aalto and UTU finalist will present their findings live, in 4 minutes.</p> <p>Evaluation panel will select the best teams.</p> <p>Prize Ceremony</p> |

# Round 1 Video Pitch



**From Tuesday 9.4 until Friday 19.4. - 10 days**

Each team will produce **3 minute video** where they pitch their data insights to the Aalto's and UTU's lecturers.

Please make sure your team understands the requirements, do's and don'ts as well as the evaluation criteria before you start working on your task.



## Allowed

### DO's

Tableau Cloud (all services)

Create your own filters, calculations, hierarchies, parameters and actions on top of the existing data set

Use / merge external data sets with the data provided.

Use Tableau help and all training materials.

Have fun!



### DONT's

## Not Allowed

Use of Python & R

Use of other BI tools

Data fabrication (naturally)

Borrowing / copying insights from an other team

Leaving team members behind

# Evaluation Criteria

For both rounds of the challenge



## Quality of Insights

**1/3 of the weight**

Accurate insights

Finding hidden insights

Insights for action

## Leading With Data

**1/3 of the weight**

Back your findings with data visualizations & KPIs

Make your findings stand out and easy to pick up

## Pitching

**1/3 of the weight**

Good use of time

Flow of the pitch

Storytelling

# Round 2 Live Final



**Tuesday 23.4 from 09:50 till 13:00**

**5 best teams from Aalto vs 5 best teams from UTU**

Live final takes place in Aalto School of Business,  
Otaniemi Campus in Espoo

Aalto and UTU teams take turns to repeat their **4 minute pitch** in random order

Each team will have approximately 10 minutes

- 1 minutes to prepare
- 4 minutes to pitch
- Up to 5 minutes for Q&A with board members



# Tableau Analytics Challenge Final

What happens on the day of the final?

Tuesday 23.4 from 09:30 till 13:00

09:30 - 09:50 Event venue opens

09:50 - 10:00 Welcome words

10:00 - 10:10 UNICEF

10:10 - 11:00 Pitching by the challenge finalists x 5

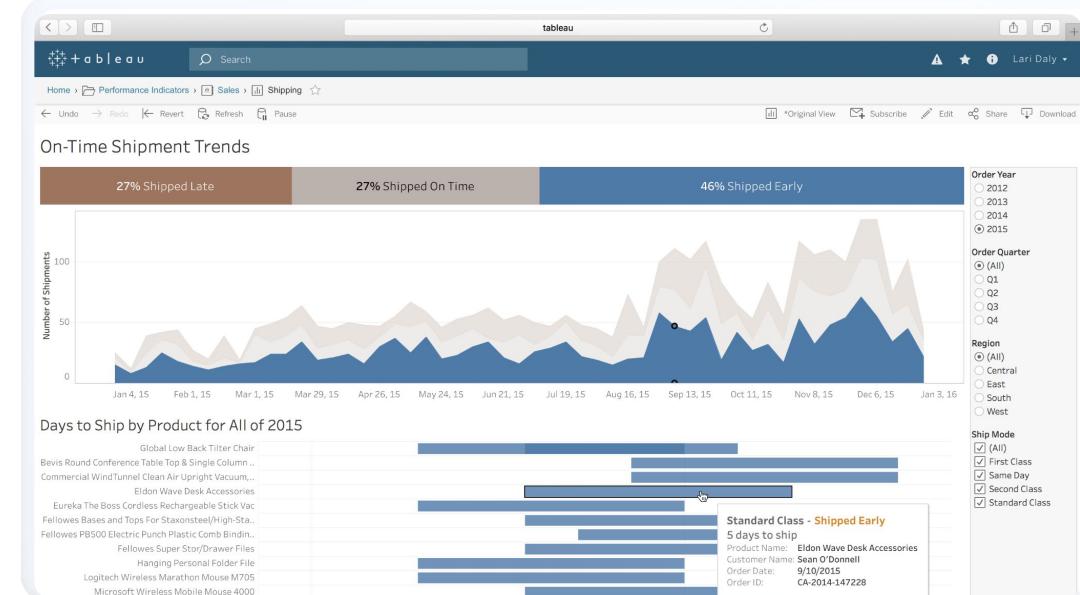
11:00 - 11:10 Break - Coffee and Pulla

11:10 - 12:00 Pitching by the challenge finalists x 5

12:00 - 12:20 Break (board will decide the winner)

12:30 - 12:45 Prize Ceremony

12:45 - 13:00 Farewell words



# Organizers



**Yong Liu**

Associate professor  
Aalto



**Timo Leino**

Lecturer  
UTU



**Johanna Bragge**

Assoc. Program Director  
Aalto



**Janne Lind**

Lead Solution Engineer  
Salesforce / Tableau



# Evaluation Board



**Janne Lind**

Lead Solution Engineer  
Salesforce / Tableau

**Tableau** is a visual analytics platform transforming the way we use data to solve problems.

**Tableau** empowers people and organizations to see and understand and take action on their data.



**Mystery Judge**

WithSecure

**WithSecure** is a global cyber security and privacy company, which has its headquarters in Helsinki.

**WithSecure** is the strategic partner for businesses that want measurable cyber security outcomes through customised tools & solutions.



**2 x Mystery Judges**

UNICEF

**UNICEF** responsible for providing humanitarian and developmental aid to children worldwide.

The organization is one of the most widely known and visible social welfare entities globally, operating in 192 countries and territories.



# Prize Ceremony



## Best Overall

Selected by the **Evaluation Board**



**TEAM X  
UNI X**

## Best of Aalto

Selected by **UTU students**



**TEAM X  
AALTO**



## Best of UTU

Selected by **Aalto students**



**TEAM X  
UTU**



# Thank You

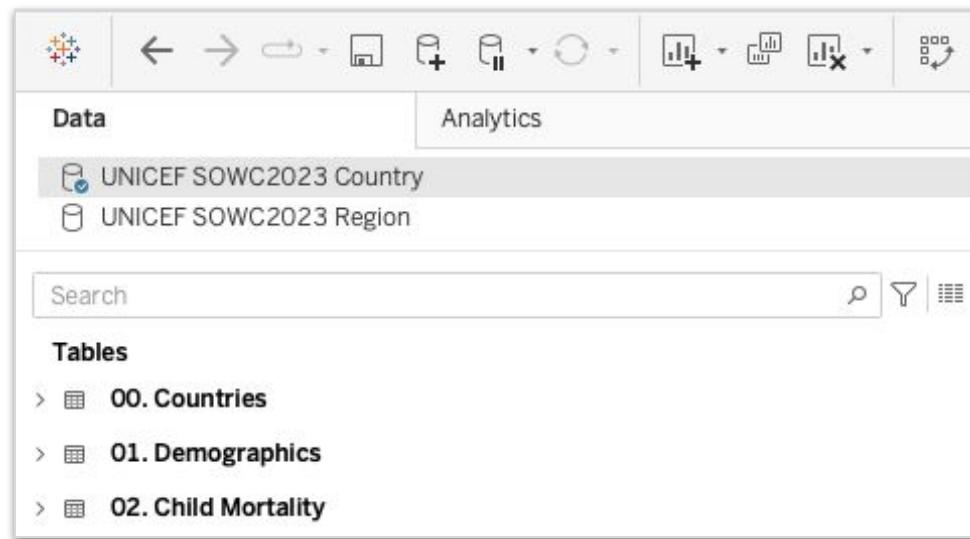


# Appendix

Few extra tips and tricks on:  
How to get the best out of the Tableau  
with SOWC data?  
How to avoid typical pitfalls?

# Two SOWC Data Sources

One of the region level and one on country level



The screenshot shows the Data pane of a worksheet. At the top, there are navigation icons and tabs for 'Data' and 'Analytics'. Below the tabs, a list of data sources is shown. The first source, 'UNICEF SOWC2023 Country', is highlighted with a light gray background, indicating it is the selected data source. The second source, 'UNICEF SOWC2023 Region', is listed below it. In the bottom right corner of the Data pane, there is a small green square containing a white checkmark icon.

Please note the **two data sources** in the top of the Data pane. You can not work with both data sources in the same worksheet (data visualization).

The data source that is currently **selected** is **highlighted** with background color. The data source that is currently **used** on this worksheet is marked with the little  tick mark.

The Region data source **may** be used to answer the Task 1 in the detailed requirements.

The Country data source **must** be used to answer the Task 2 in detailed requirements.  
The Region data source can be used to support Task 2 analysis.



# More About the Metrics



## Not understanding what is the Gini Coefficient or Palma Index?

|     |   |
|-----|---|
|     | <b>DEFINITIONS OF THE INDICATORS</b>  |
| 233 | Mothers with newborns receiving cash benefit (%) – Proportion of women giving birth covered by maternity benefits: ratio of women receiving cash maternity benefits to women giving birth in the same year (estimated based on age-specific fertility)      |
| 234 | Proportion of children covered by social protection – Proportion of children covered by social protection benefits: ratio of children/households receiving child or family cash benefits to the total number of children/households with children.          |
| 235 | Distribution of Social Protection Benefits – Percentage of benefits going to the 1st quintile, bottom 40% and 5th quintile relative to the total benefits going to the population. social protection coverage includes: providing social assistance through |
| 236 | Share of household income – Percentage of income received by the 20 per cent of households with the highest income, by the 40 per cent of households with the lowest income and by the 20 per cent of households with the lowest income.                    |
| 237 | Gini Coefficient – Gini index measures the extent to which the distribution of income (or, in some cases, consumption expenditure) among individuals or households within an economy deviates from a perfectly equal distribution. A Lorenz curve p         |
| 238 | Palma Index of income inequality – Palma index is defined as the ratio of the richest 10% of the population's share of gross national income divided by the poorest 40%'s share.  |
| 239 | GDP per capita (current US\$) – GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not include             |
| 240 | VMIR (vast majority income ratio) - The Vast Majority Income Ratio measures the income ratio of the first 80% (vast majority) in the income ranking.  |
| 241 |   |
| 242 |   |

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# Missing Data



It is a challenge to accurately collect over 100 metrics on all 201 countries.

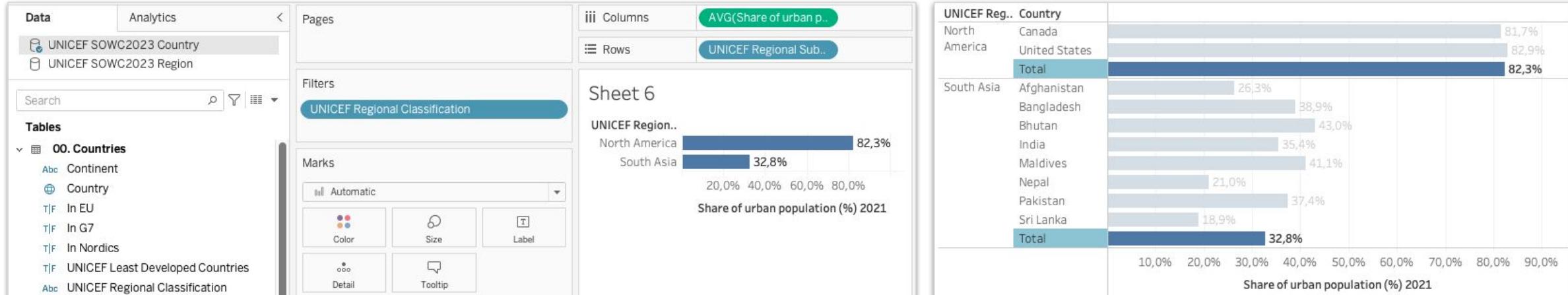
|    | A                                      | B  | C   | D  | E       | F          | G   | H       | I          | J                              | K  | L   | M   | N   | O | P |
|----|--|--|---|--|---------|------------|---|---------|------------|--------------------------------|--|---|---|-----|---|---|
| 1  | TABLE 13. SOCIAL PROTECTION AND EQUITY |  |   |  |         |            |   |         |            |                                |  |   |   |     |   |   |
| 2  | Countries and areas                    | Mothers with newborns receiving cash benefit (%) 2010–2019 (R) | Proportion of children covered by social protection 2010–2019 (R) | Distribution of social protection benefits (%) 2010–2019 (R) |         |            | Share of household income (%) 2010–2019 (R) |         |            | Gini Coefficient 2010–2019 (R) | Palma Index of income inequality 2010–2019 (R) | VMIR (vast majority income ratio) 2010–2019 (R) | GDP per capita (current US\$) 2010–2019 (R) |     |   |   |
| 3  |  |  |   | Bottom 40%   | Top 20% | Bottom 20% | Bottom 40%                                  | Top 20% | Bottom 20% |                                |  |   |   |     |   |   |
| 4  | Afghanistan                            | 2  | 0   | -  | -       | -          | -   | -       | -          | 31                             | -  | -   | -   | 507 |   |   |
| 5  | Albania                                | -  | -   | 46   | 14      | 28         | 20  | 41      | 8          | 33                             | 1,3  | 0,8   | 5 353                                       |     |   |   |
| 6  | Algeria                                | 11   | -   | -  | -       | -          | 23  | 37      | 9          | 28                             | 1,0  | 0,8   | 3 974                                       |     |   |   |
| 7  | Andorra                                | -  | -   | -  | -       | -          | -   | -       | -          | 28                             | 1,0  | -   | 40 886                                      |     |   |   |
| 8  | Angola                                 | -  | -   | -  | -       | -          | 12  | 56      | 4          | 51                             | 3,5  | 0,6   | 2 791                                       |     |   |   |
| 9  | Anguilla                               | 73   | 2   | -  | -       | -          | -   | -       | -          | -                              | -  | -   | -   | -   |   |   |
| 10 | Antigua and Barbuda                    | 37   | -   | -  | -       | -          | -   | -       | -          | -                              | -  | -   | 17 113                                      |     |   |   |
| 11 | Argentina                              | 32   | 80  | 75   | 6       | 49         | 14  | 48      | 5          | 42                             | 2,1  | 0,7   | 9 912                                       |     |   |   |
| 12 | Armenia                                | 62   | 30  | 58   | 9       | 36         | 22  | 39      | 9          | 34                             | 1,4  | 0,7   | 4 623                                       |     |   |   |
| 13 | Australia                              | 100  | 100   | -  | -       | -          | 20  | 42      | 7          | 33                             | 1,3  | 0,7   | 55 057                                      |     |   |   |

There is a significant amounts of missing data. Work with the data available. If the missing data is having a significant impact on your analysis you may raise this issue as a part of the your pitch, but do not spend too much time on this.



# Aggregating Percentages and Ratios

Average of the percentage / ratio is not resulting to a correct results.



Unfortunately, the SOWC data set does not contain base values behind the many percentage / ratio metrics in the report. Special attention needs to be paid when aggregating metrics as they may result to incorrect results. This applies specifically to percentage and ratio metrics. Country-level percentages / ratios are correct on country-level.

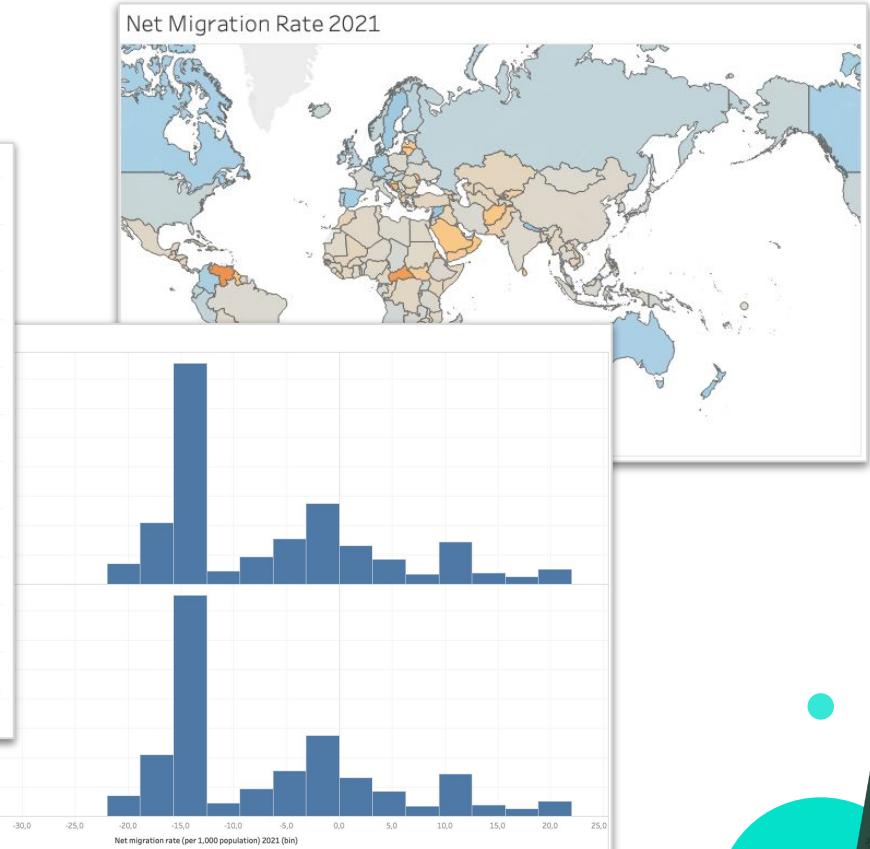
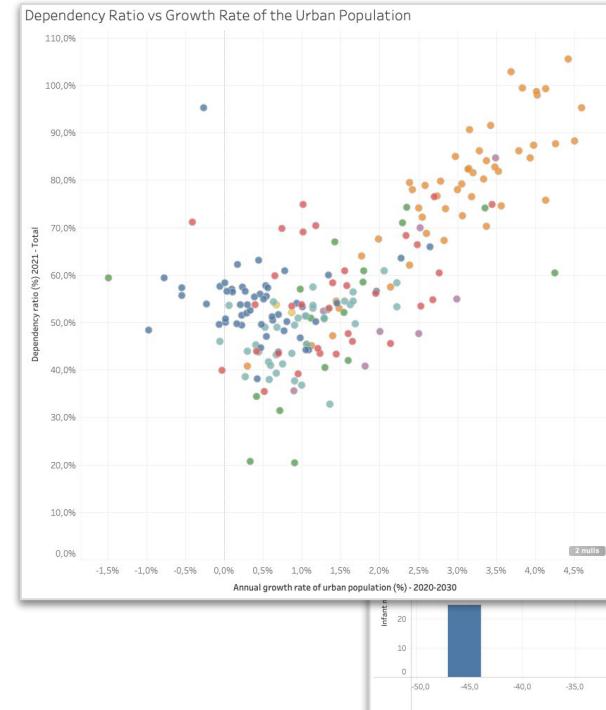
**Example** - Average of the “Share of Urban Population” for North America is not **82.3%**. As calculation **(81,7 + 82,9)/2** gives you incorrect result. This calculation does not take into account that the USA has more than 8 times the population of Canada.

# How to Analyse If Aggregates Can Not Be Used?

Here are some ideas to get your engine running



- KPIs (or BANs in Tableau lingo)
- Comparisons
- Ranking
- Top / Bottom
- Geospatial
- Scatter
- Distributions
- Spot Outliers
- etc



# Dealing with Loooong Metric Names

*“Annual number of births (thousands) 2021”*

| Country             | Annual growth rate of.. | Annual growth rate of.. | Annual number of birt.. | Annual population gr.. | Annual population gr.. |
|---------------------|-------------------------|-------------------------|-------------------------|------------------------|------------------------|
| Afghanistan         | 4,1%                    | 3,5%                    | 1,441                   | 3,3%                   | 2,3%                   |
| Albania             | 1,4%                    | 0,9%                    | 29                      | 0,5%                   | 0,2%                   |
| Algeria             | 2,6%                    |                         |                         |                        |                        |
| Andorra             | 0,5%                    |                         |                         |                        |                        |
| Angola              | 4,8%                    |                         |                         |                        |                        |
| Anguilla            | 1,6%                    |                         |                         |                        |                        |
| Antigua and Barbuda | -0,3%                   |                         |                         |                        |                        |
| Argentina           | 1,1%                    |                         |                         |                        |                        |

Some of the SOWC metric names do have a very long names.

**Tip #1** - Use **Edit Alias** feature to shorten the name.

**Tip #2** - Use **visualization title / subtitle** to explain what you see in the visualization.



# Making a Team Copy of Template Workbook



Easy when you know it

A screenshot of the Tableau Explore interface. On the left, there's a sidebar with links like Home, Favorites, Recents, Shared with Me, Recommendations, Personal Space, Collections, and Explore. The main area shows a folder named "UNICEF" owned by "Janne Lind". Inside the folder, there are two items: "Example - Annual Population Growth Rate 2020s" and "UNICEF SOWC2023 Coun...". A context menu is open over the second item, with "Edit Workbook" highlighted.

## Step 1.

Click ... in the **UNICEF SOWC Template Workbook** object and choose **Edit Workbook**

A screenshot of the Tableau Edit mode. A "Publish Workbook" dialog box is open in the foreground. It shows the "Name" field set to "My UNICEF Workbook Copy" and the "Location" dropdown set to "Personal Space (Private to me)". The background shows a world map visualization with a color scale for "Annual population growth rate (%)" ranging from -1.7% to 3.4%.

## Step 2.

Once the Workbook opens in the Edit mode, click **Publish As**, give your Workbook copy name and choose **your Team Folder** or **Personal Space** as destination Location.

# Team Collaboration and Publish Step



Teamwork makes the dreams work

Please note that Tableau currently **DOES NOT** have functionality that would allow multiple users to update team workbook or worksheets simultaneously (like in Google Sheets).

It is therefore recommended that each team member works on their **own copy** of the Workbook and when interesting insight is found, dashboard or visualization is built, the copy is created in the team's "Master workbook".

In addition, it is important to understand Tableau's autosave feature. When you start editing a published Tableau workbook, you will create a temporary copy of the workbook that is only visible to the user. The user needs to **Publish the workbook to team folder** to make changes visible to the other users.

You may save your draft Workbooks into the Personal Space to keep your Team Folder tidy.