

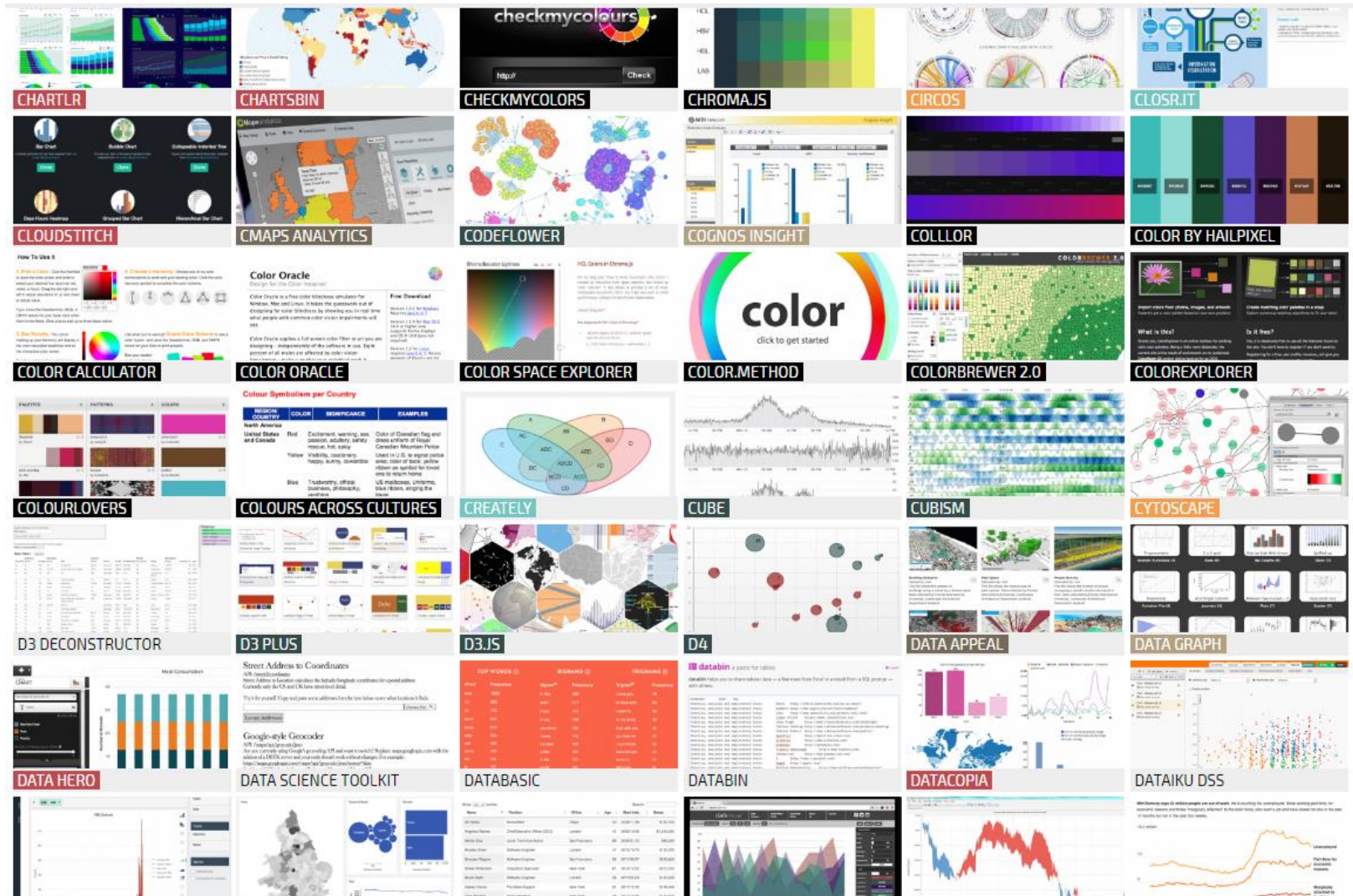
TOOLS FOR DATA VISUALIZATION

WHY, WHAT AND HOW

João Pedro Azevedo
Global Lead

Minh Nguyen
Economist

There are a lot of tools available for data visualization



Tools for different users

- For Developers (some examples)
 - D3.js (Data Driven Documents)
 - FusionCharts
 - Charts.js
 - Dygraphs
- For Non-Developers (some examples)
 - Datawrapper
 - Tableau
 - Raw
 - Plotly
 - Google (Fusion, Data Explorer, Search, Analytics)

What is the purpose?

- Comparable data series within and across countries
- Ensure regional comparability data and statistics
- Enable scalability on the process of data harmonization
- Enable greater efficiency in the use of statistics for regional research and policy dialogue
- Share the knowledge between teams and units

When to use?

- To analyze your data (simple or complicated)
- To convey complex data and abstract information in a easy-understanding manner
- To visualize information, systems, and to perform visual analytics
- To illustrate timelines and relationships
- To tell the stories effectively and convincingly, reach the audience
- To make the message/point more compelling

The value of data visualization

- Two basic types
 - Exploration – find a story that the data is telling you
 - Explanation – tell a story to the audience
- Represent the large amount of data coherently
- Help the audience to recognize the relationships in the data
- Present the data untouched (without changing the data)
- Take into account your audience's expectations

What is the principle?

- Target audience
- Getting the message across: what information and how much detail
- Narrative: telling the story
- Visualization is an integral part of statistical production processes
- Learned and cultural assumptions affect design choices (colors, icon, symbols, language context)
- Don't forget color blindness

Some tools for visualizations

- **Visualizing development data**
 - DevInfo – a tool for organizing, storing and presenting data in a uniform way to facilitate data sharing at the country level across government departments, UN agencies and development partners
 - GapMinder – see statistics on world's most important trend (easy to understand)
 - World Bank Data Visualization Tools – list of tools supported by the World Bank

Some tools for visualizations

- **Data visualization tools and webpages**
 - [Tableau](#)
 - [Google Fusion](#)
 - Javascript ([D3](#), [Datavisualization](#))
- **Infographics** (webpages to create infographics)
 - [infogr.am](#) - create interactive infographics with charts, tables, pictures, videos and text
 - [easel.ly](#) - create infographics using different available templates
 - [visual.ly](#) - a one-stop shop for the creation of infographics and a community to share your creations
- **Others** (flowcharts, word clouds, timeline drawing, mind mapping, etc.)

ECA Data Lab

- ECA Data lab is a data-sharing platform with the latest microdata, indicators, tools, and analytics on poverty, shared prosperity, and equity in the Europe and Central Asia (ECA).
- Aims to build a critical body of knowledge on how to bend the arc of poverty reduction and foster shared prosperity by providing friendly and interactive visualizations and indicators.
- Internally:
 - Provide access to micro data through *datalibweb*.
 - Foster institutional memory and easy access by providing the do-files of all calculations, with proper vintages of the data and its indicators.
- The ECA Data lab was created with the following goals in mind

Objective of ECA Data Lab

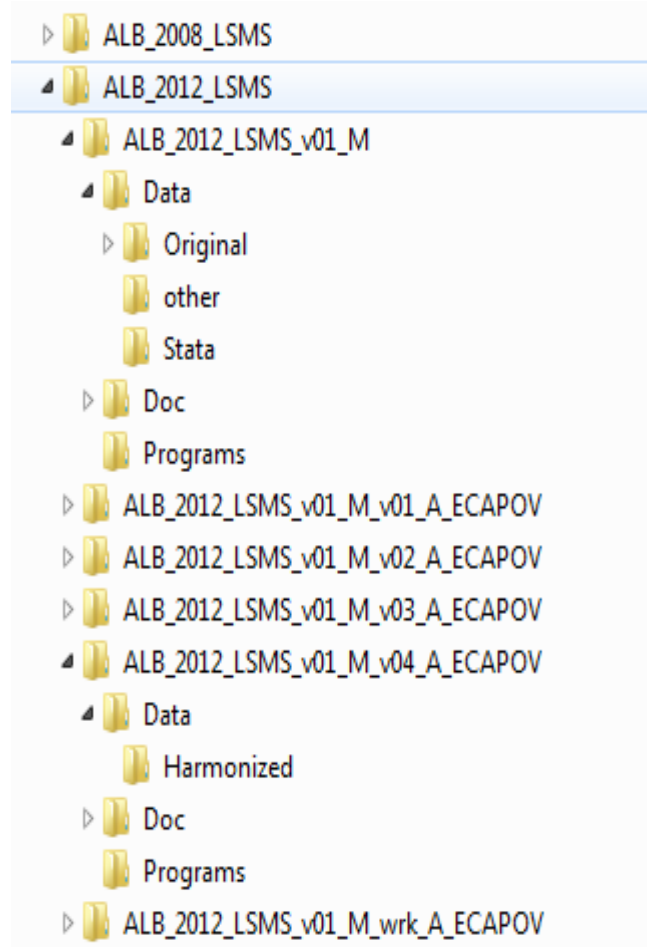
- Engage with National Statistical Offices across the region, other relevant organizations, and across practices in the WBG to improve data quality and availability among our clients.
- Track poverty, equity and other outcomes in the region using the latest data and cutting edge analytics for policy makers and practitioners in ECA through releases of the Poverty and Shared Prosperity At a Glance (Data brief)
- Provide user-friendly access to the most up-to-date data in the region through –*datalibweb*- ensuring that outputs rely on the same datasets.
- Recognize the work of junior staff.

What is the purpose?

- Comparable data series within and across countries
- Ensure regional comparability data and statistics
- Enable scalability on the process of data harmonization
- Enable greater efficiency in the use of statistics for regional research and policy dialogue
- Share the knowledge between teams and units

How do we inform users on the vintage of data?

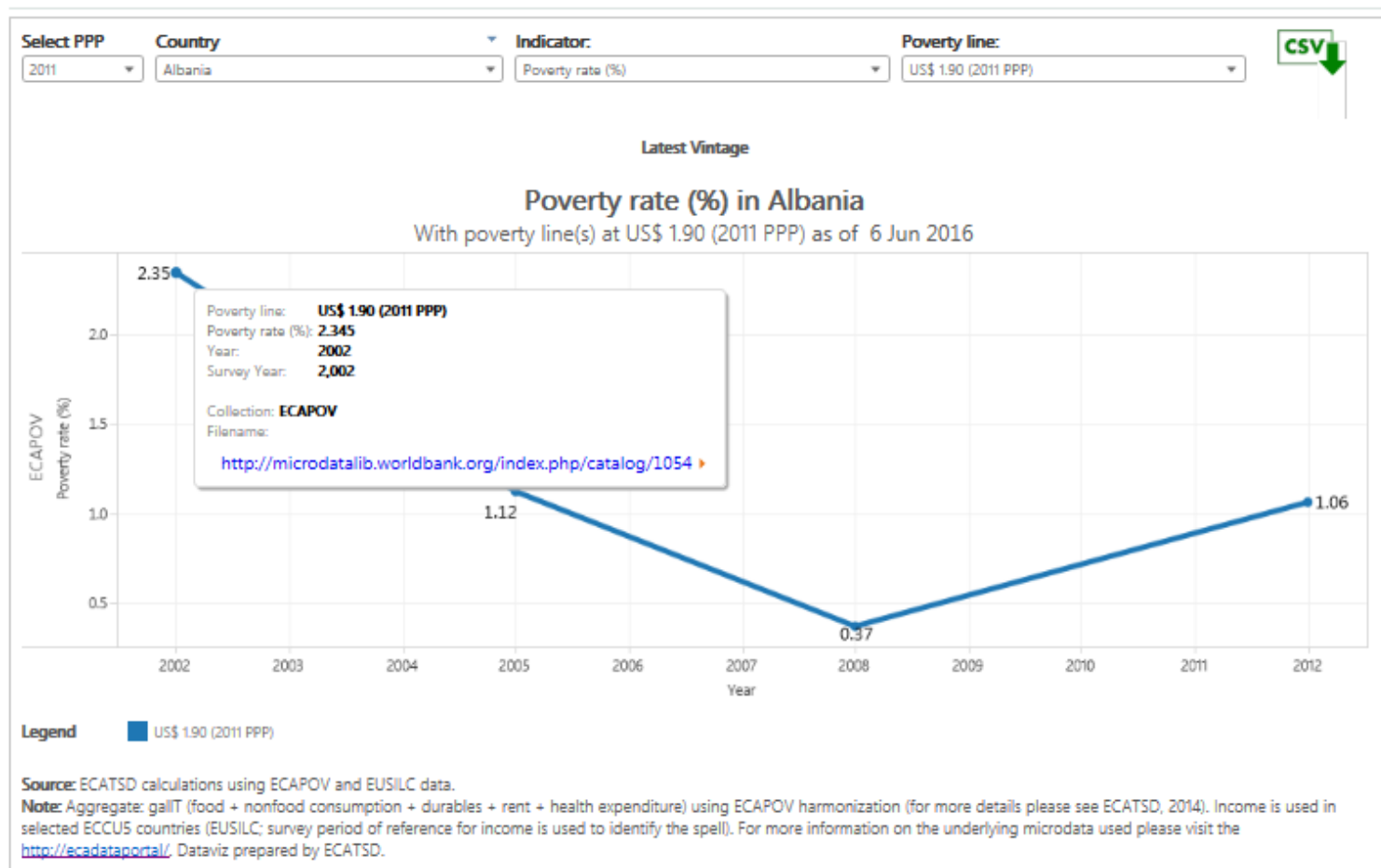
- The data and programs (scripts) were organized in the hierarchical structures, with the following structures:
- CCC – Countrycode
- YYYY – Survey year
- SSSS – acronym of the survey (i.e. HBS, LSMS, HIES)
- vNN_M – version of master/original data
- vMM_A – version of harmonized/adaptation data
- i – ECAPOV modules (i=2,3...,10)



Some examples of dashboards in ECA Data Lab

Informing users on the vintage of the indicators

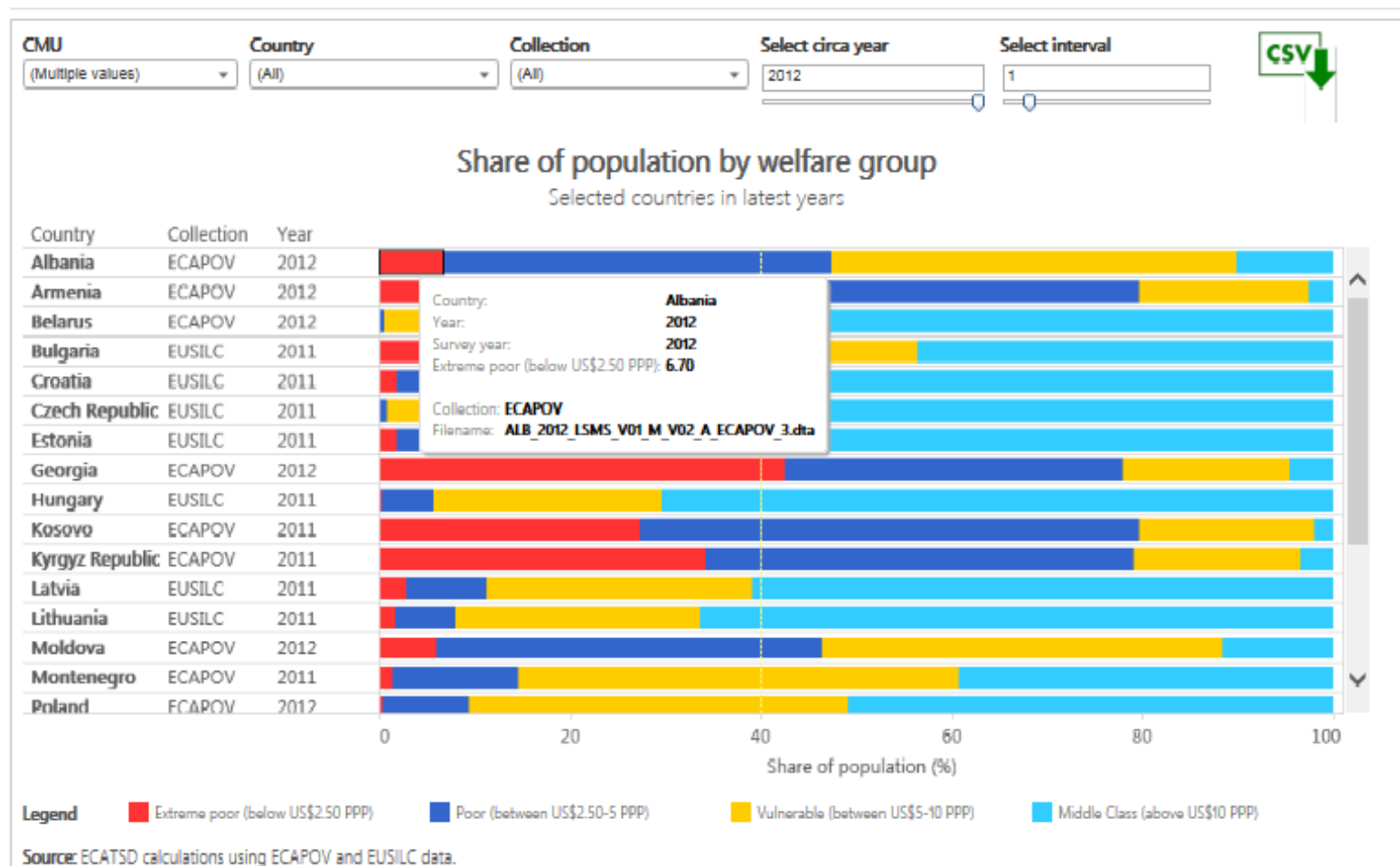
National Trends



Some examples of dashboards in ECA Data Lab

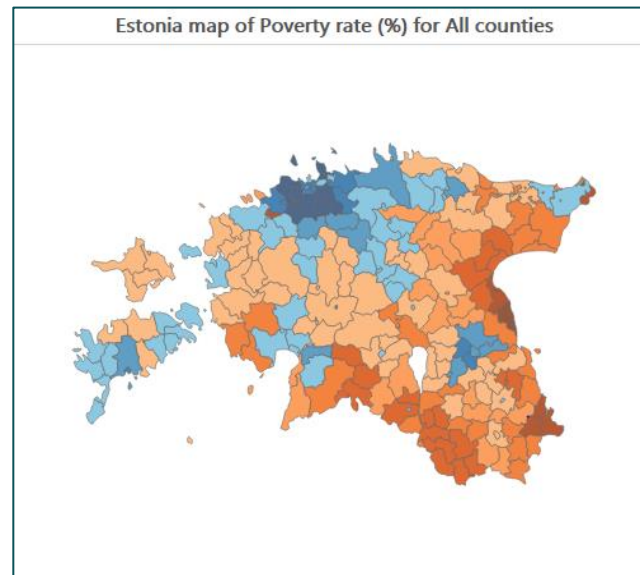
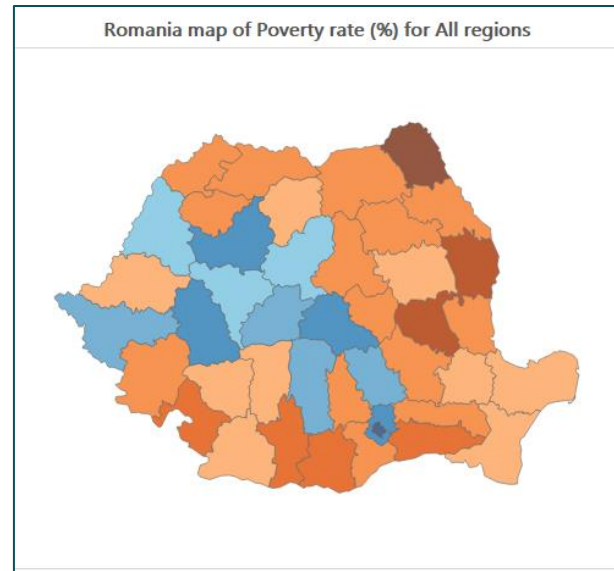
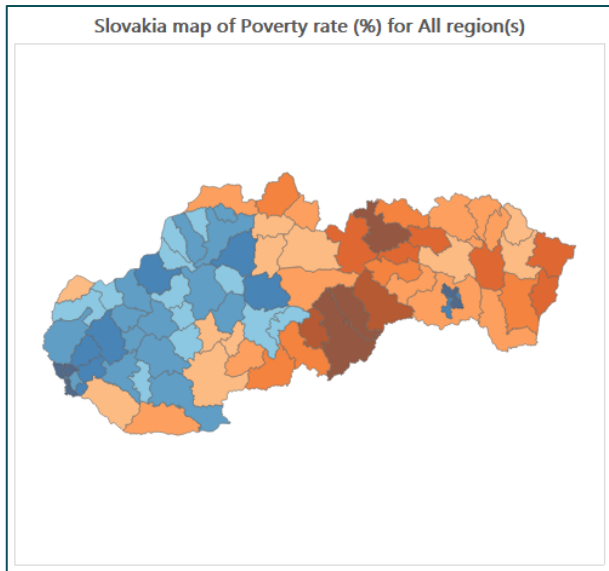
Allowing interactive selection for ready-to-use graphs

Cross-Country Comparison



Some examples of dashboards in ECA Data Lab

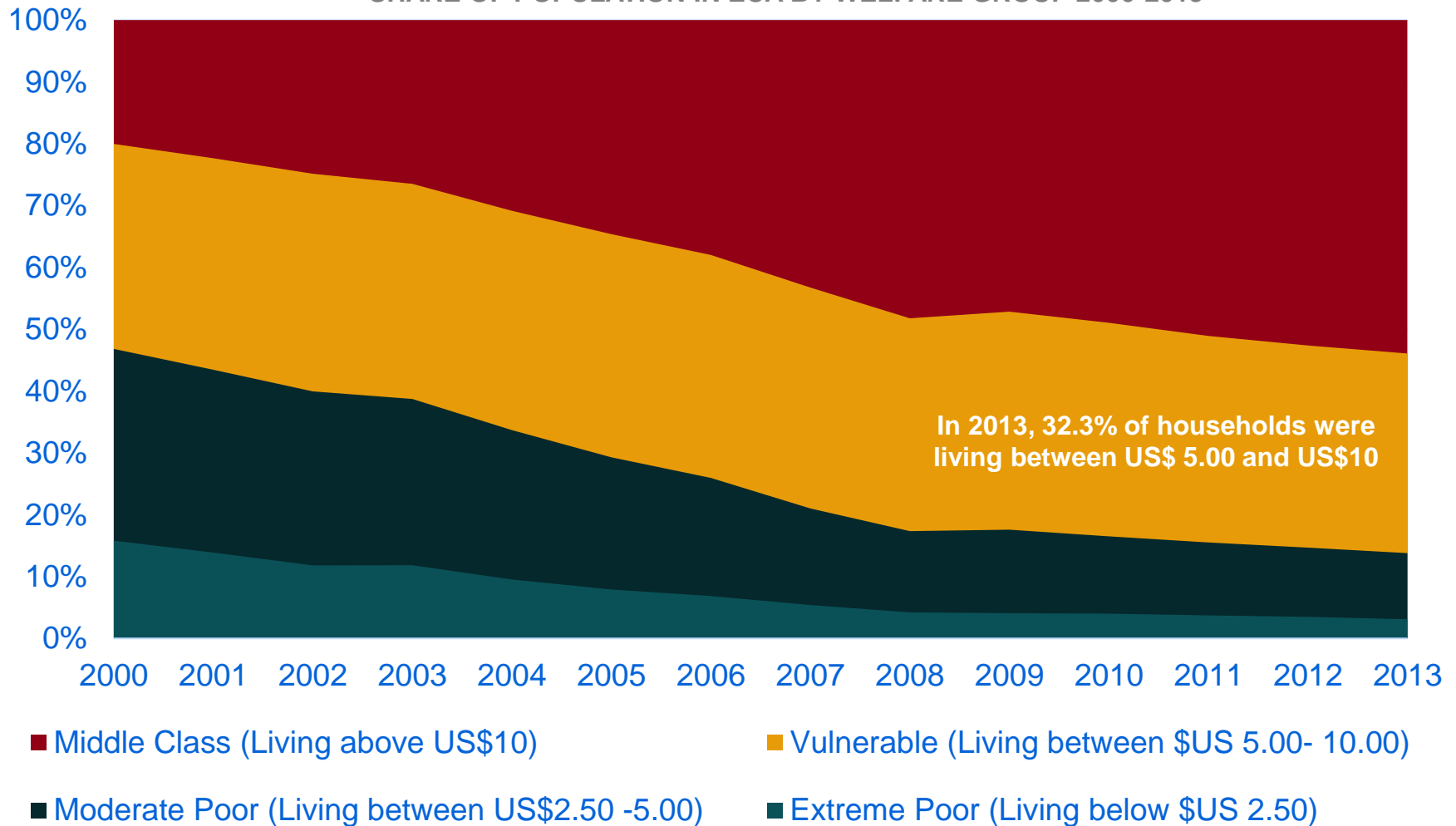
Interactive maps of sub-national poverty rates in selected countries



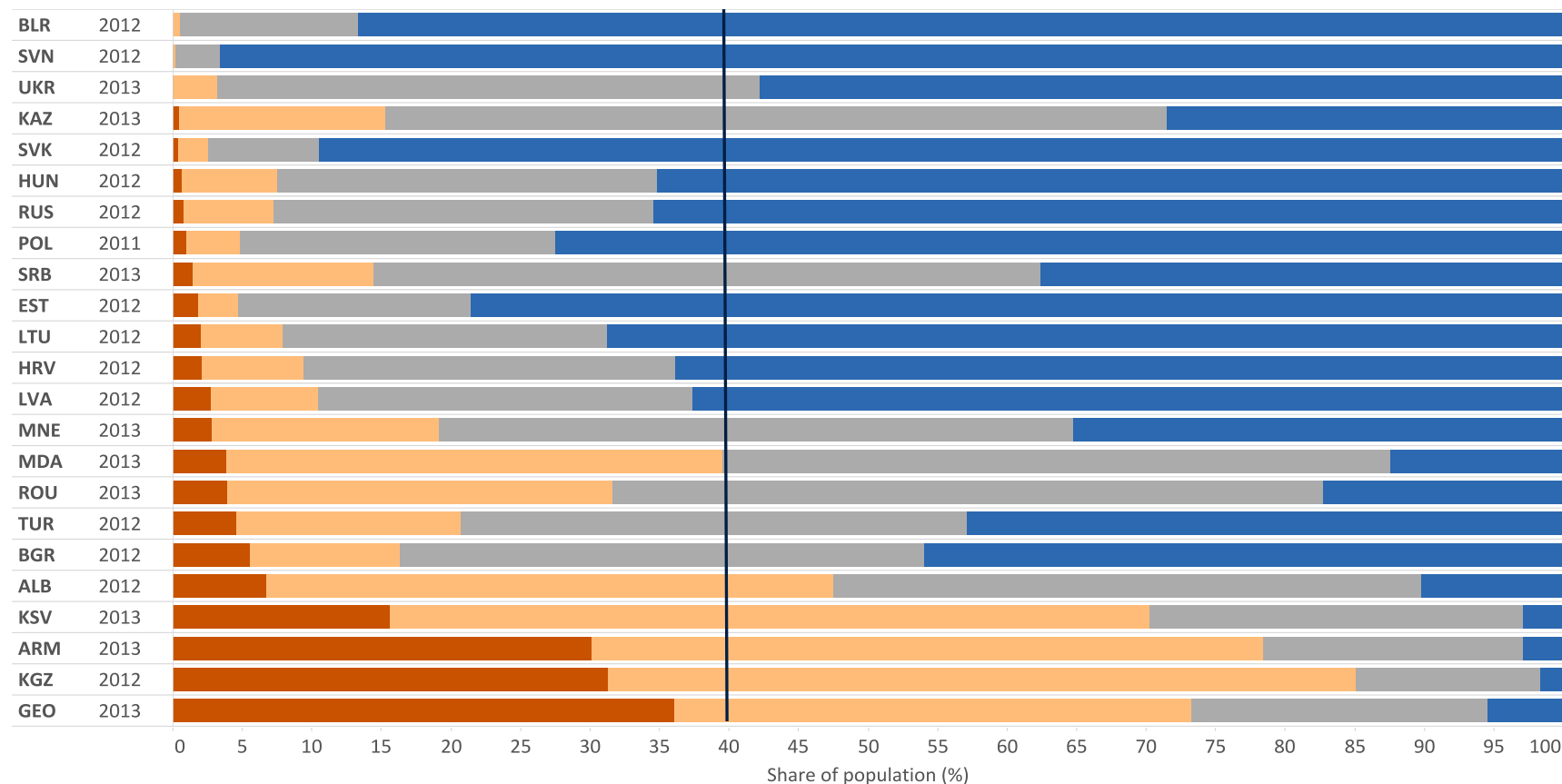
Source: ECATSD calculations using
ECAPOV and EUSILC data

Economic Groups

SHARE OF POPULATION IN ECA BY WELFARE GROUP 2000-2013



... and in many cases the vulnerable group accounts for a significant share of the B40

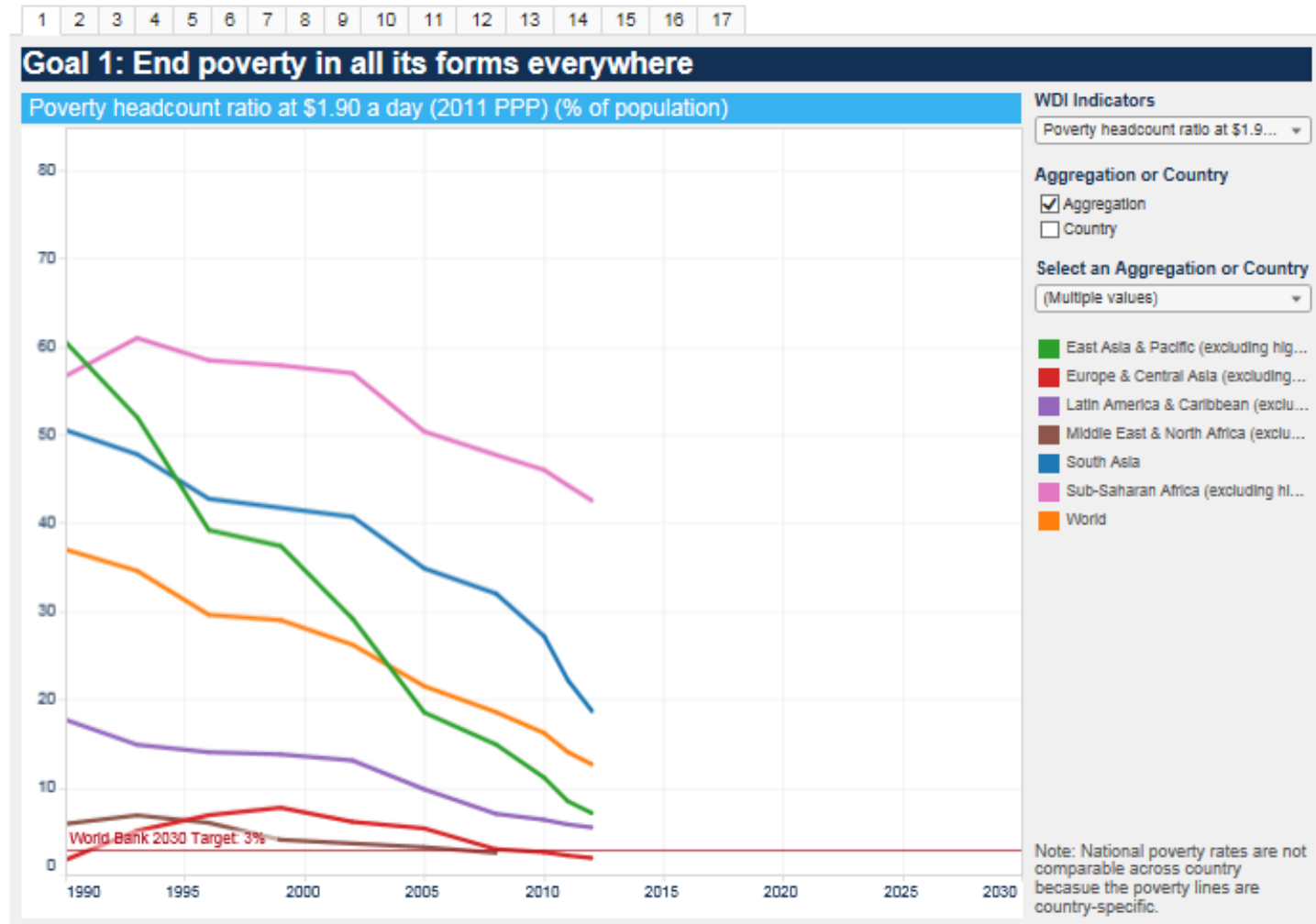


Economic Group

- Middle class (above US\$10 PPP)
- Vulnerable (between US\$5-10 PPP)
- Poor (between US\$2.50-5 PPP)
- Extreme poor (below US\$2.50 PPP)

Data visualization for monitoring SDG goals

Interactive dashboards using World Development Indicators (WDI)



These dashboards will be updated to reflect new data that become available in the WDI. Click here for a complete list of SDG goals and targets.

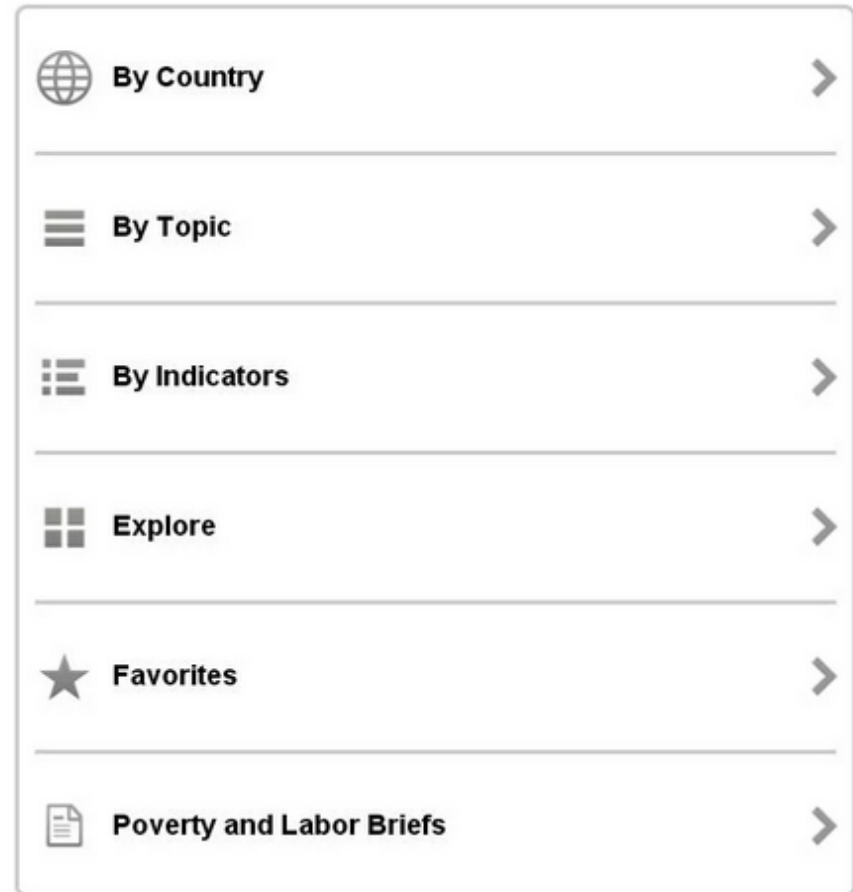
Other platforms of data visualization

Apps – Poverty DataFinder



Poverty DataFinder

Latin America and the Caribbean



Other platforms of data visualization

Set of indicators and trends for one particular country

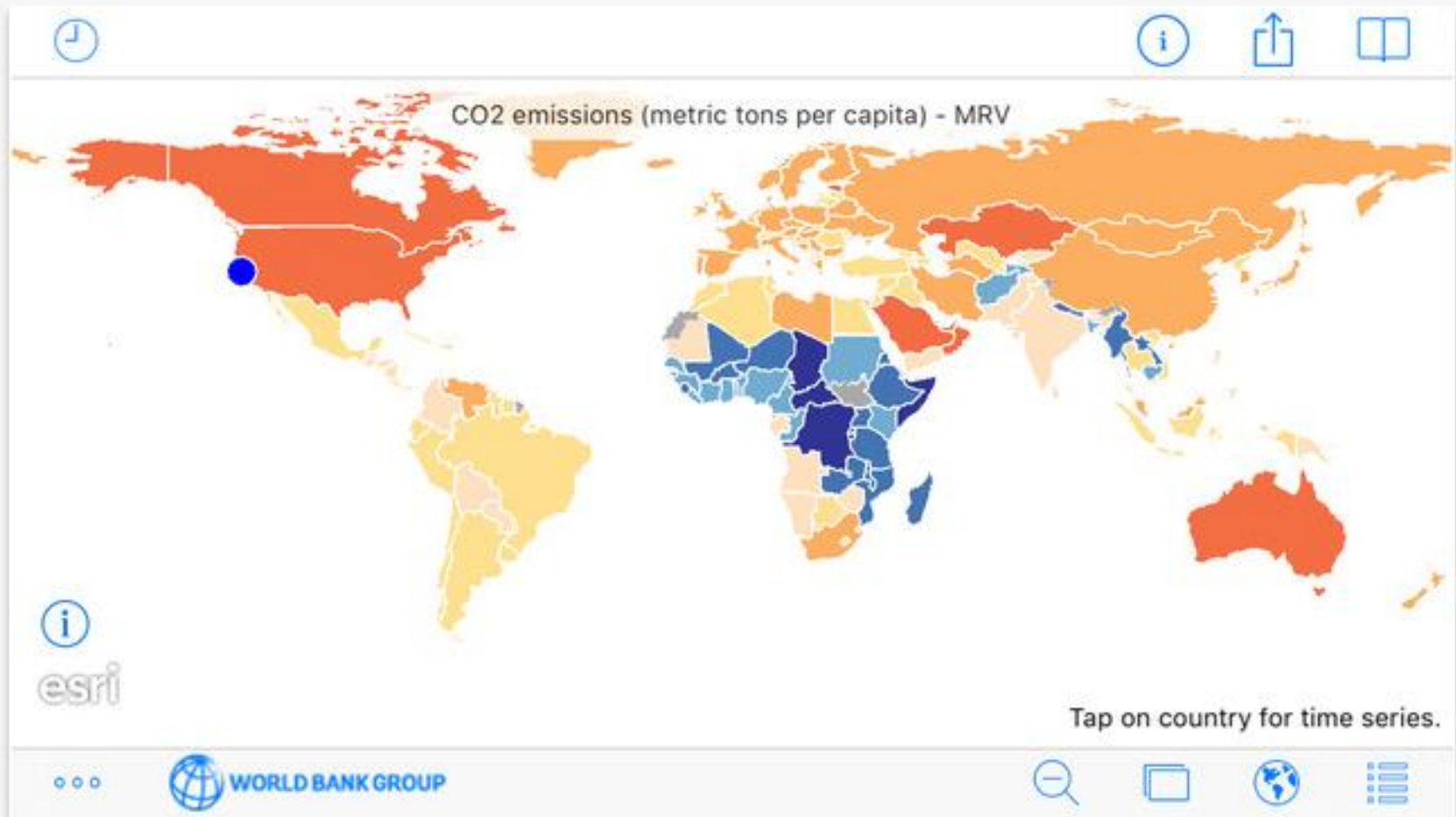


Other platform of data visualization

Spatial Agent (Apps) – visualize multiple-sectoral spatial and temporal data

Screenshots

iPhone | iPad

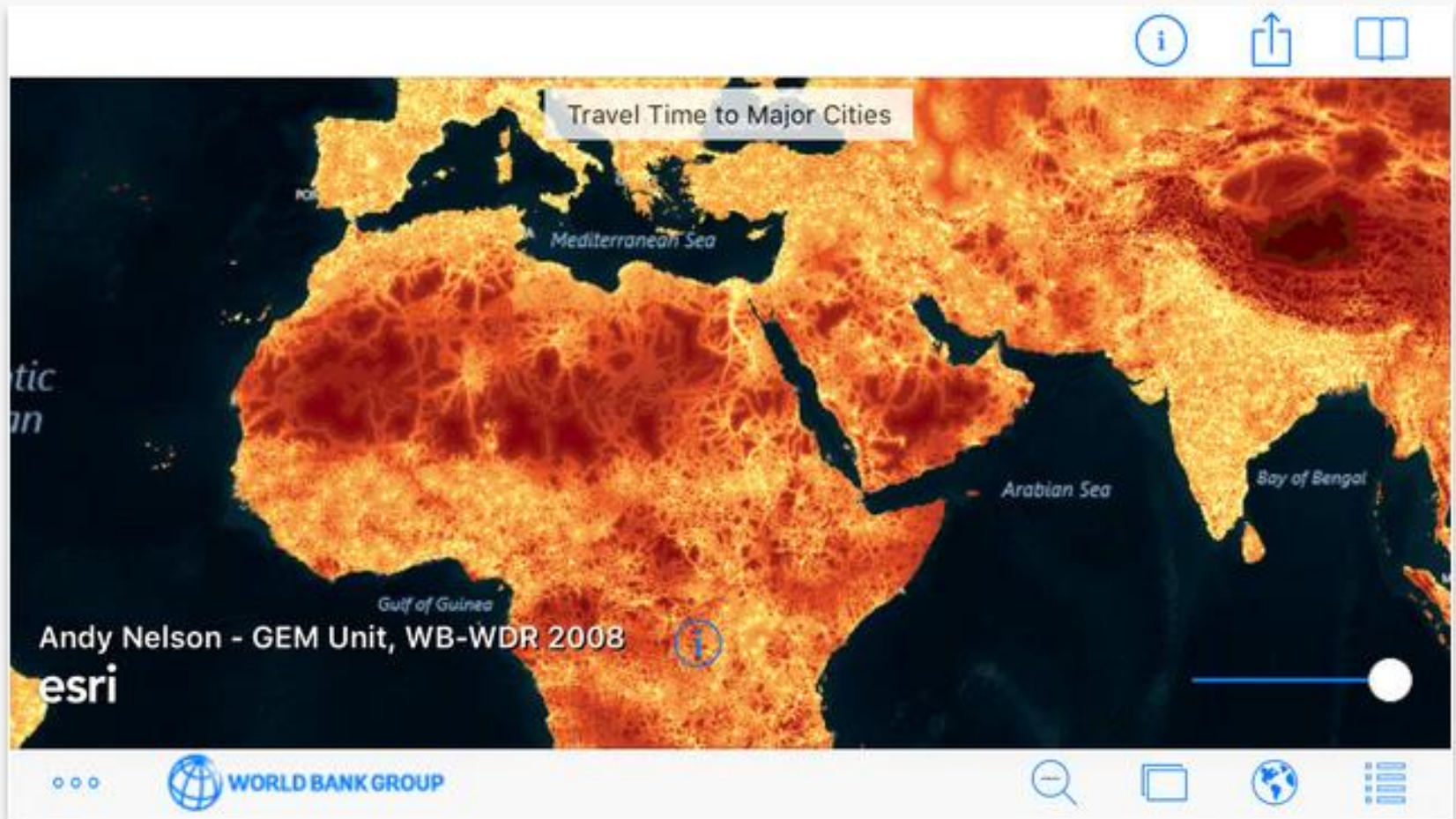


Other platform of data visualization

Spatial Agent (Apps) – visualize multiple-sectoral spatial and temporal data

Screenshots

iPhone | iPad



Data visualization as a great tool to understand the complex and interesting topics

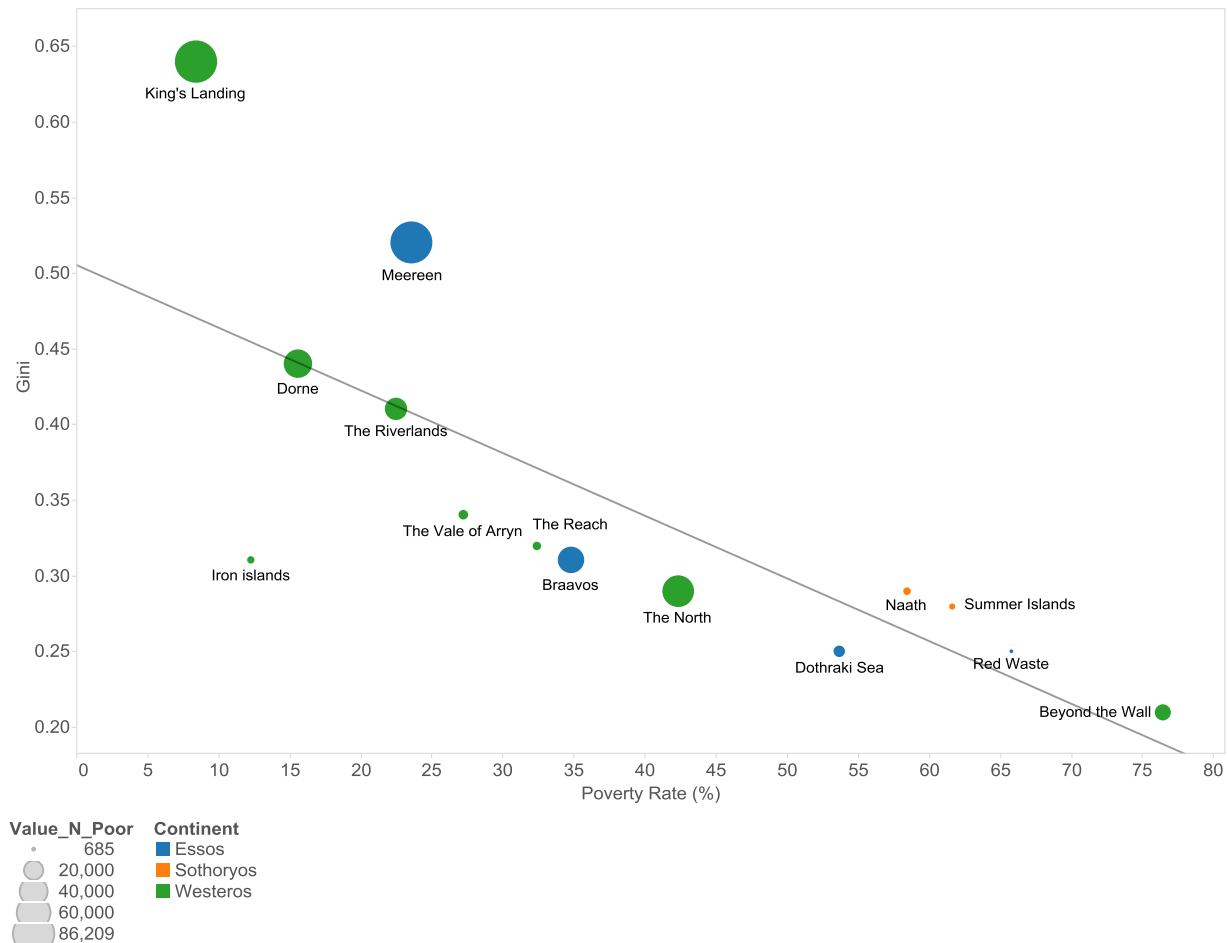
User interactivity helps to deep dive into findings

- The Guardian ([Income comparison between generations](#)); and related [article](#)
- The New York Times ([The American Middle Class is no longer The World's Richest](#))
- Help Age International
 - [Data on Aging](#)
 - [Aging in motion](#)
- UNESCO ([World Inequality Database on Education](#))
- United Nations ([World Income Inequality Database](#))

Annex 1

Poverty and Gini with Tableau

Scatterplot: Gini vs Poverty Rate (colored by continent & Size of bubbles by number of poor)



How to get there

1. Prepare the data
2. Connect tableau to the data
3. Make the graph (using filters, marks and calculated fields)

Preparing data for Tableau

Wide Format

| Region | Poverty Rate | Number of Poor | Gini | Continent |
|-------------------|--------------|----------------|------|-----------|
| The Reach | 32.4 | 3473 | 0.32 | Westeros |
| The Riverlands | 22.5 | 23978 | 0.41 | Westeros |
| The North | 42.3 | 48392 | 0.29 | Westeros |
| Dorne | 15.6 | 39017 | 0.44 | Westeros |
| The Vale of Arryn | 27.2 | 4421 | 0.34 | Westeros |
| Iron islands | 12.3 | 2583 | 0.31 | Westeros |
| Dothraki Sea | 53.7 | 6307 | 0.25 | Essos |
| Braavos | 34.8 | 33728 | 0.31 | Essos |
| Meereen | 23.6 | 84932 | 0.52 | Essos |
| Summer Islands | 61.6 | 1850 | 0.28 | Sothoryos |
| Naath | 58.4 | 2853 | 0.29 | Sothoryos |
| King's Landing | 8.4 | 86209 | 0.64 | Westeros |
| Beyond the Wall | 76.4 | 12539 | 0.21 | Westeros |
| Red Waste | 65.8 | 685 | 0.25 | Essos |

Stata
Reshape

Excel

L
o
n
g

F
o
r
m
a
t

| Region | Value | Indicator | Continent |
|-------------------|-------|----------------|-----------|
| The Reach | 32.4 | Poverty Rate | Westeros |
| The Riverlands | 22.5 | Poverty Rate | Westeros |
| The North | 42.3 | Poverty Rate | Westeros |
| Dorne | 15.6 | Poverty Rate | Westeros |
| The Vale of Arryn | 27.2 | Poverty Rate | Westeros |
| Iron islands | 12.3 | Poverty Rate | Westeros |
| Dothraki Sea | 53.7 | Poverty Rate | Essos |
| Braavos | 34.8 | Poverty Rate | Essos |
| Meereen | 23.6 | Poverty Rate | Essos |
| Summer Islands | 61.6 | Poverty Rate | Sothoryos |
| Naath | 58.4 | Poverty Rate | Sothoryos |
| King's Landing | 8.4 | Poverty Rate | Westeros |
| Beyond the Wall | 76.4 | Poverty Rate | Westeros |
| Red Waste | 65.8 | Poverty Rate | Essos |
| The Reach | 3473 | Number of Poor | Westeros |
| The Riverlands | 23978 | Number of Poor | Westeros |
| The North | 48392 | Number of Poor | Westeros |
| Dorne | 39017 | Number of Poor | Westeros |
| The Vale of Arryn | 4421 | Number of Poor | Westeros |
| Iron islands | 2583 | Number of Poor | Westeros |
| Dothraki Sea | 6307 | Number of Poor | Essos |
| Braavos | 33728 | Number of Poor | Essos |
| Meereen | 84932 | Number of Poor | Essos |
| Summer Islands | 1850 | Number of Poor | Sothoryos |
| Naath | 2853 | Number of Poor | Sothoryos |
| King's Landing | 86209 | Number of Poor | Westeros |
| Beyond the Wall | 12539 | Number of Poor | Westeros |
| Red Waste | 685 | Number of Poor | Essos |
| The Reach | 0.32 | Gini | Westeros |
| The Riverlands | 0.41 | Gini | Westeros |
| The North | 0.29 | Gini | Westeros |
| Dorne | 0.44 | Gini | Westeros |
| The Vale of Arryn | 0.34 | Gini | Westeros |
| Iron islands | 0.31 | Gini | Westeros |
| Dothraki Sea | 0.25 | Gini | Essos |
| Braavos | 0.31 | Gini | Essos |
| Meereen | 0.52 | Gini | Essos |
| Summer Islands | 0.28 | Gini | Sothoryos |
| Naath | 0.29 | Gini | Sothoryos |
| King's Landing | 0.64 | Gini | Westeros |
| Beyond the Wall | 0.21 | Gini | Westeros |
| Red Waste | 0.25 | Gini | Essos |

Connecting Tableau to Excel File

Connect

To a file

Excel

Text File

Access

Statistical File

Other Files

To a server

Tableau Server

Microsoft SQL Server

MySQL

Oracle

Amazon Redshift

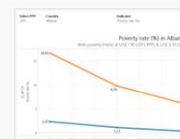
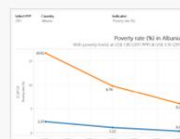
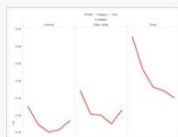
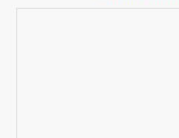
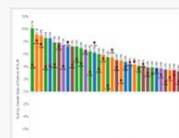
More Servers...

Saved data sources

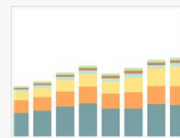
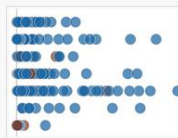
Sample - Superstore

World Indicators

Open



Sample Workbooks



Discover

Training (view all)

- Getting Started
- Connecting to Data
- Visual Analytics
- Understanding Tableau

VIZ OF THE WEEK

What will Brexit mean to the UK?

Resources

Blog - Radar-Chart Tutorial, Tableau Server Tips among Best of the Tableau Web

Tableau Conference 2016

Forums

Connecting Tableau to Excel File

long (poverty_known_world)

Connected to Excel

Workbook
poverty_known_world.xlsx

Sheets
Enter sheet name

long
wide

1. Select the sheet you want to work with

2. Select the type of connection

3. Click on the sheet for Tableau to make the connection

Connection
Live ☒ Extract Edit... Refresh
Extract will include all data.

Filters
0 Add...

Copy

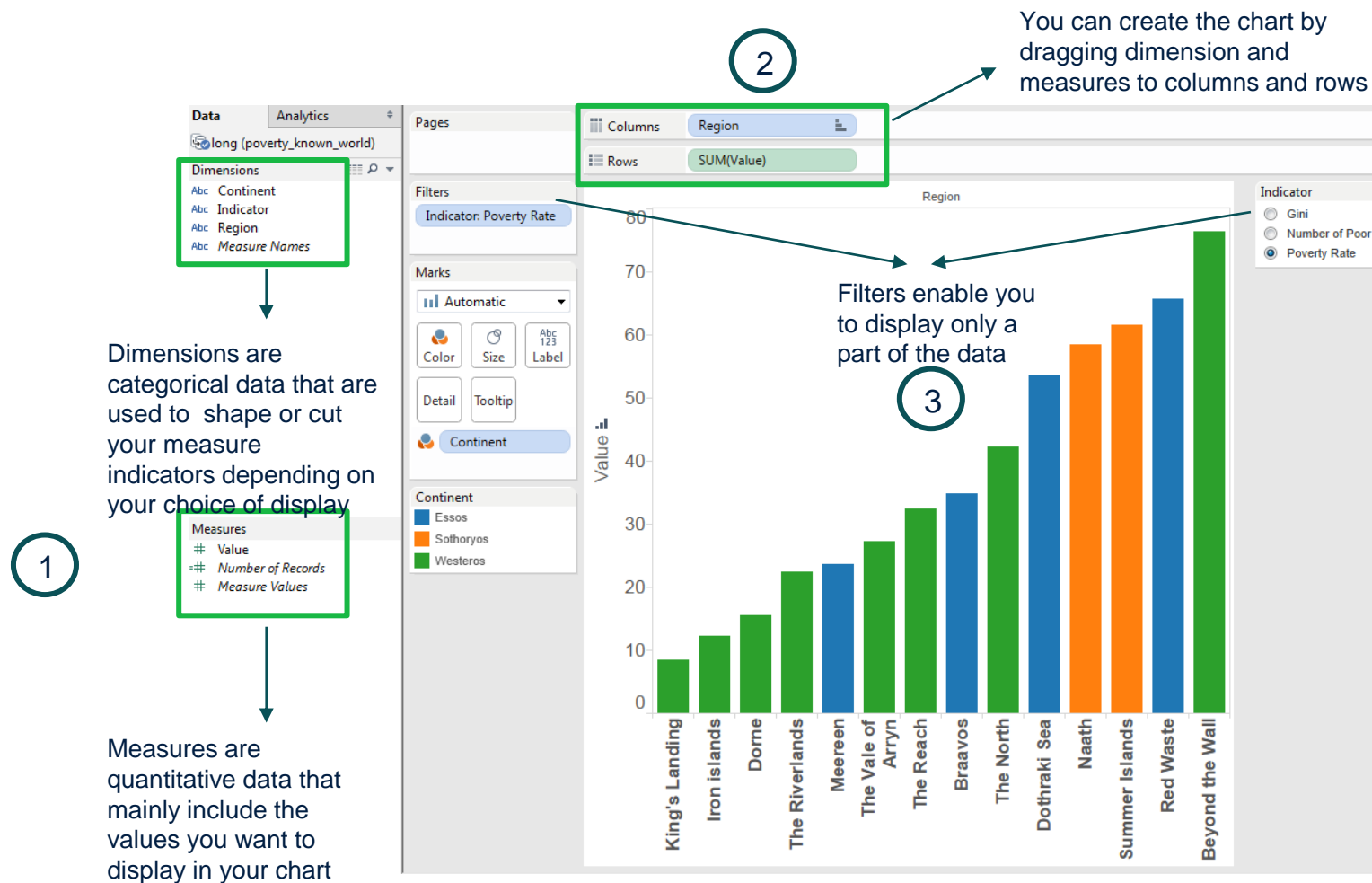
Show aliases Show hidden fields Rows 42

| Region Abc | Value # | Indicator Abc |
|--------------------|------------|------------------|
| The Reach | 32.40 | Poverty Rate |
| The Riverlands | 22.50 | Poverty Rate |
| The North | 42.30 | Poverty Rate |
| Dorne | 15.60 | Poverty Rate |
| The Vale of Arr... | 27.20 | Poverty Rate |
| Iron islands | 12.30 | Poverty Rate |
| Dothraki Sea | 53.70 | Poverty Rate |
| Braavos | 34.80 | Poverty Rate |
| Meereen | 23.60 | Poverty Rate |
| Volantis | 14.10 | Poverty Rate |
| Qarth | 19.60 | Poverty Rate |
| King's Landing | 8.40 | Poverty Rate |
| Beyond the Wall | 76.40 | Poverty Rate |
| Red Waste | 65.80 | Poverty Rate |
| The Reach | 3,473.00 | Number of Poor |
| The Riverlands | 23,978.00 | Number of Poor |

Go to Worksheet

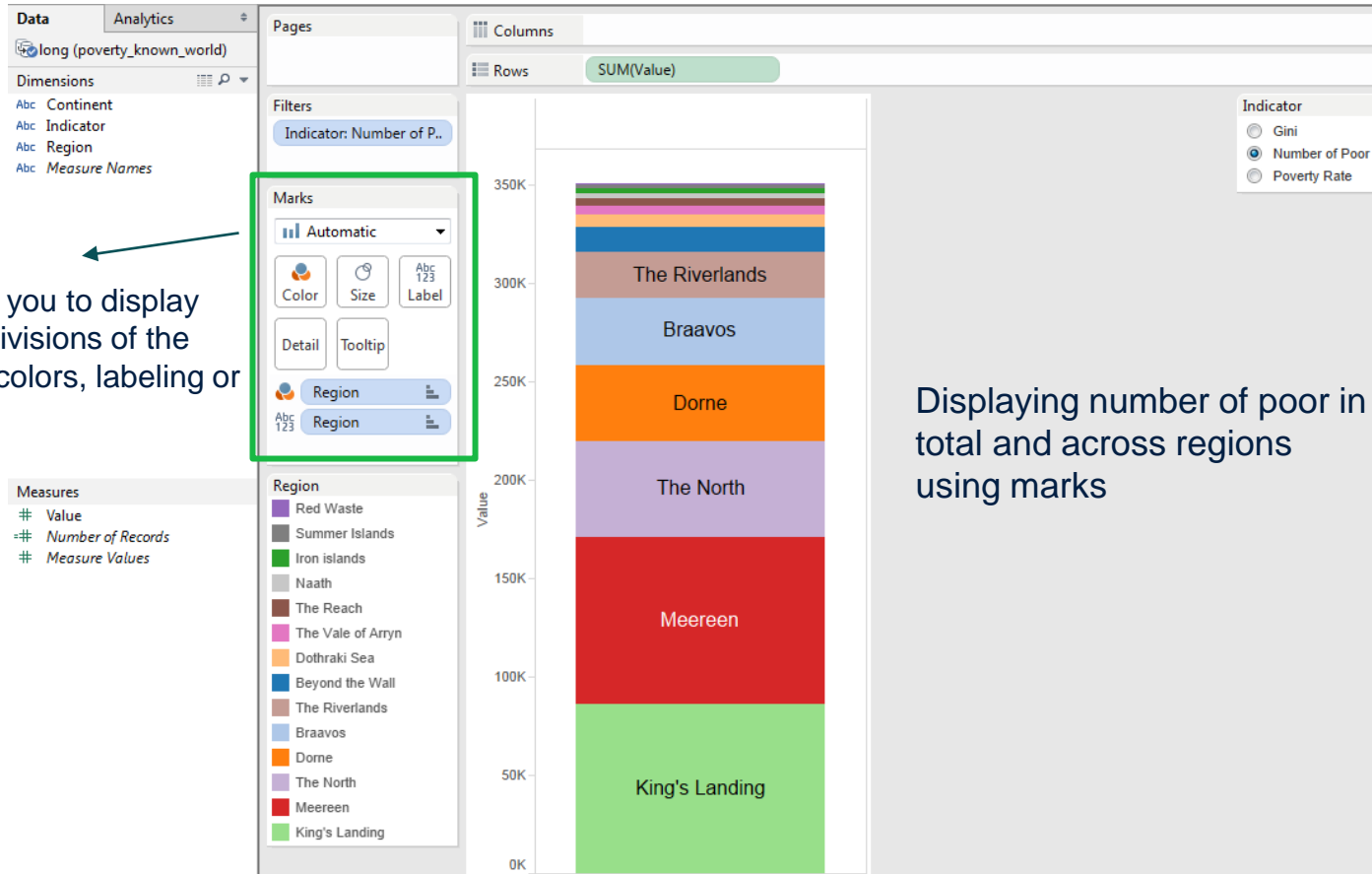
Data Source Sheet 1

MAKING A GRAPH



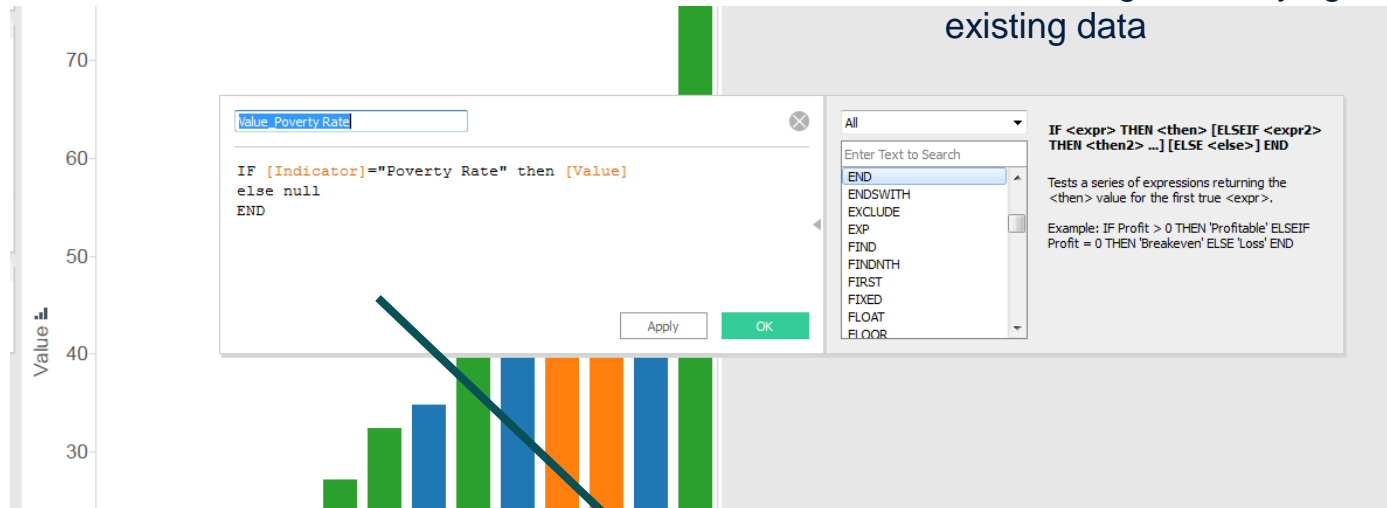
USING MARKS

Marks enable you to display different subdivisions of the data through colors, labeling or sizing



CALCULATED FIELDS

Calculated fields enable you to create new indicators by conditioning or modifying the existing data



The calculated field “Value_Poverty_Rate” is a new column that **equals “Value” for Poverty rates** and **equals null for number of poor and gini rates**.

| Continent | Indicator | Region | Number of Records | Value | Value_Poverty_Rate |
|-----------|----------------|--------------|-------------------|-----------|--------------------|
| Essos | Number of Poor | Braavos | 1 | 33,728.00 | Null |
| Essos | Number of Poor | Dothraki Sea | 1 | 6,307.00 | Null |
| Essos | Number of Poor | Meereen | 1 | 84,932.00 | Null |
| Essos | Number of Poor | Red Waste | 1 | 685.00 | Null |
| Essos | Poverty Rate | Braavos | 1 | 34.80 | 34.8000 |
| Essos | Poverty Rate | Dothraki Sea | 1 | 53.70 | 53.7000 |
| Essos | Poverty Rate | Meereen | 1 | 23.60 | 23.6000 |
| Essos | Poverty Rate | Red Waste | 1 | 65.80 | 65.8000 |

SCATTERPLOT: POVERTY RATE VS GINI

