



Tableau Workshop

July 31, 2019 – Addis Ababa University





Data Visualization Workshop using Tableau

Yacob Zuriaw



How do we know whether a country is making progress in its ability to plan, finance, and implement solutions to address its own development challenges?

- Brandon Pustejovsky, USAID Chief Data Officer

**QED Group brings
more than 20 years
providing data-driven
and insightful solutions
in nearly 100 countries.**

Working across the “three Ds” of foreign affairs; Defense, Diplomacy and Development, we help our clients collect, analyze, visualize, and ultimately use data in more effective ways.



The map is an overview of active Feed the Future mechanisms funded by US Missions globally. The information displayed is from the Feed the Future Monitoring System (FTFMS) database. It provides information on the different FTF partners that are implementing mechanisms, their connections, project summary, location of activities and life of project.

Instructions

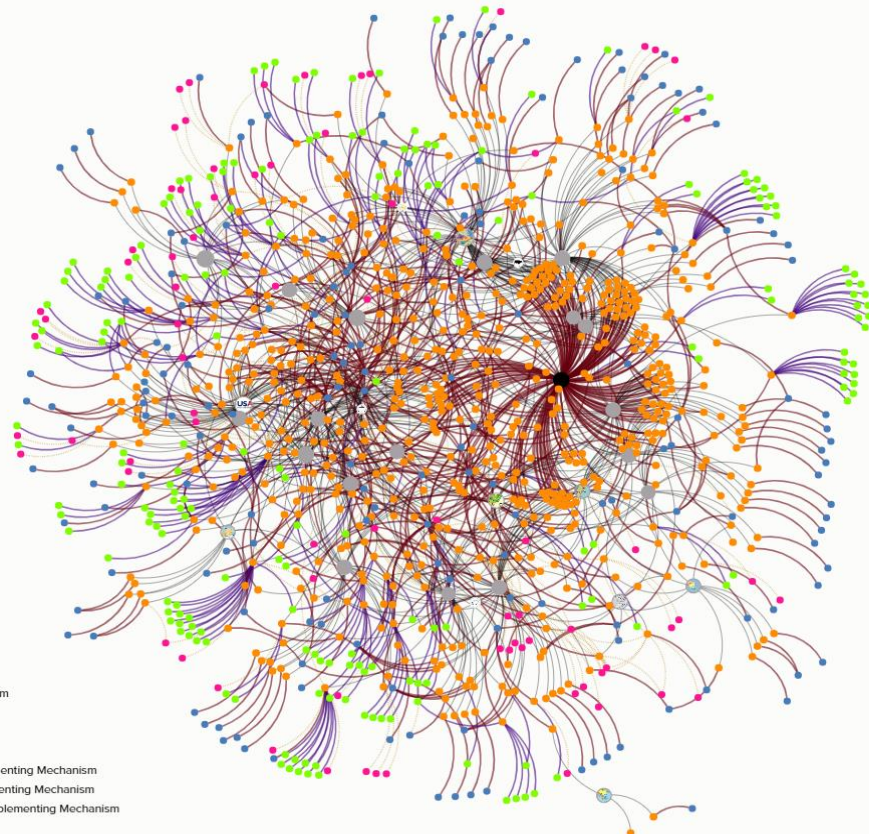
You can navigate through the map using the icons on the top right side of the map.

- Use the + (plus) and - (minus) sign to zoom in and out.
- You can filter the different elements/nodes and their connections in the map by clicking on “Filter” on the bottom right and select the elements from the drop down menu.
- To view connections for a particular Mission, select the country name from the Default view drop down menu next to the title.
- If you would like to focus on the connections of a particular node/element, click and hold the specific node. To clear the focus click on the icon that looks like the image below:

Q Search

Legend

- Implementing Mechanism
- Prime Partner
- Non Local Partner
- Local Partner
- Prime Partner of Implementing Mechanism
- Local Partner of Implementing Mechanism
- - - Non Local Partner of Implementing Mechanism
- TBD (Prime Partner)



Filter



Data, Technology and Innovation





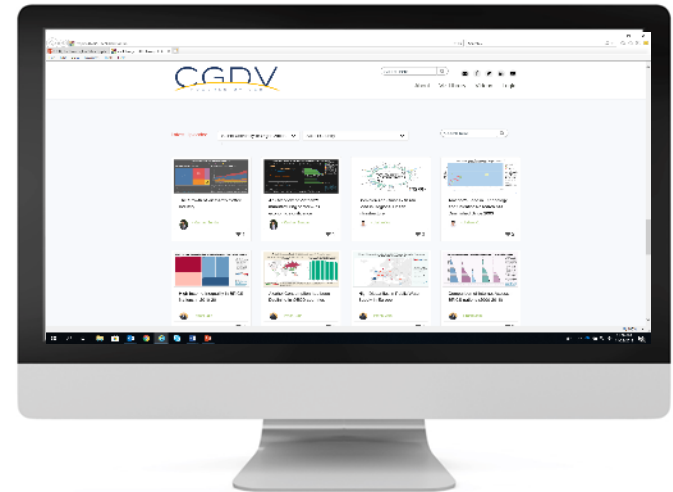
- Human-centered design
- Data analysis
- Data visualization
- Network mapping
- Infographics

CGDV

POWERED BY QED

CENTER FOR GLOBAL DATA VISUALIZATION

- Designed to **build data visualization capacity** and strengthen a **culture of data use** in international development
- Mobilizes the **power of university students** to close the gap in data visualization
- Collaborating universities will have access to **trainings** and can **publish research** on the CGDV platform





- <https://www.centerforglobaldata.org/>
- Sign up for an account
- Create your own profile!



Yacob Zuriaw

Email: yacob.zuriaw@emory.edu

Mobile:

Country: United States

Organization: Emory University

Biography:

Hi, I'm Yacob! I am a recent grad of the Master's in Development Practice program at Emory University. I have a background in Microeconomics and International Relations, and am interested in applying data insights to aid the path of progress in Ethiopia and beyond.



CENTER FOR GLOBAL DATA VISUALIZATION

- Visit our GitHub and find out public available data source
- <https://cgdv.github.io/dataSource/>

/ CGDV Recommended Data Sources

CGDV promotes open data for public good. We recommended the following data sources for researching and creating data visualizations. Please let us know if there is more to be added to the list.

- [Development Data Library \(DDL\)](#): Your gateway to USAID-funded, machine-readable data.
- [IDEA](#): International Data & Economic Analysis by USAID.
- [DEC](#): Development Experience Clearinghouse by USAID.
- [PEPFAR](#): Program results achieved through PEPFAR support.
- [CDC](#): Centers for Disease Control and Prevention.
- [FOREIGN ASSISTANCE](#): How the U.S. government invests in countries around the world.
- [DHS](#): The DHS Program: Demographic and Health Surveys.
- [DATA.GOV](#): The home of the U.S. Government's open data.
- [UNSD](#): United Nations Statistics Division
- [World Bank Open data](#): Free and open access to global development data.
- [IMF data](#): Access to macroeconomic & financial data.
- [OECD data](#): Data about OECD countries.
- [Humanitarian Data Exchange](#): Find, share and use humanitarian data all in one place
- [Google Public Data](#): Google's Public Data Explorer
- [UNICEF data](#): Monitoring the situation of children and women.
- [Global Health Observatory data repository](#): WHO's gateway to health-related statistics for more than 1000 indicators for its 194 Member States.
- [WHO/UNICEF JMP](#): The WHO/UNICEF JMP collects data on water, sanitation and hygiene in countries and regions around the world.
- [UNAIDS AIDSinfo](#): Data about HIV prevention, treatment, care and support.

Latest Uploaded

♥ Upvote

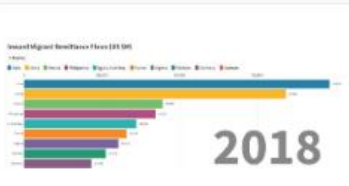
Select University or Organization ▼

Select Country ▼

Search here ...



Select Challenge ▼



Top 10 Countries by
Remittance Outflows & Inflows

- Reema Rustagi

♥ 1



Prevalence and Attitudes of
FGM in Ethiopia

- Yacob Zuriaw

♥ 1



Ebola Outbreak - DRC

Tracking the Ebola Outbreak in
the DRC

- Jiahao Xu

🏆🏆

♥ 3



Ethiopia's Shrinking Gender
Gap in Education

- Yacob Zuriaw

♥ 2



Antenatal Care in Uganda

- Jiahao Xu

🏆🏆

♥ 3



Household Access to Safe
Drinking Water in Ethiopia

- Yacob Zuriaw

♥ 3



The Growth of Gross National
Income in Central Asia from
1995-2017

- Jiahao Xu

🏆🏆

♥ 4



High Expenditure of Ethiopian
Government Leads to Increases
in Enrollment Rates for Primary

- Prachi Jain

♥ 3

What is Tableau?





What is Tableau?

- Tableau Desktop is a business intelligence and data visualization tool that can be used by anyone.
- It specializes in transforming tabulated data into eye-candy graphs and representations.
- Although designed with business in mind, it's ability to interactively visualize data freely transcends fields





What is Tableau?





Tableau vs. Excel

Tableau vs. Excel:



- People are often confused between Tableau and Microsoft Excel. Both these tools can be used to create interactive visualizations and have the tools to analyze data. But the approach each of these tools uses to reach the insights is very different.
- Tableau is a data visualization tool, meaning that it formats data in the initial stage into pictorial representations. When users drill down the data, the representations change accordingly. Excel, on the other hand, needs the user to first analyze data in tabular format and then opt for visualizations for better understanding and insights.

Tableau Installation

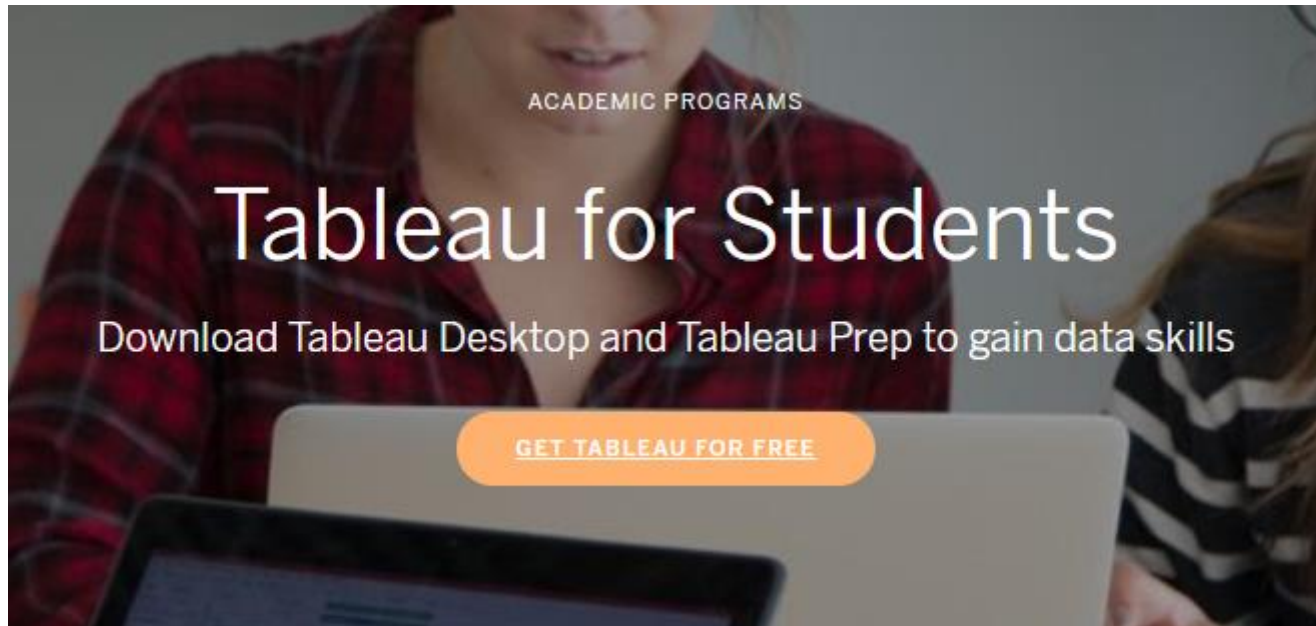




Tableau Installation

- Tableau Academic Program:

www.tableau.com/academic/students





Verify Your Student Identity

You will receive an email from Tableau with instruction of how to download and activate Tableau

Country

*Country (of school)**

Ethiopia

ACADEMIC PROGRAMS

Personal information

*Legal First Name**

Legal First Name

*Legal Last Name**

Legal Last Name

*Email**

Email

*Confirm Email**

Confirm Email

Generation Data

School information

*School Name**

School Name

Hear how Matt Farkas, a recent graduate of Northwestern University, got a data science internship at Spotify.

VERIFY AND CONTINUE



Tableau for Public

- Tableau Public: public.tableau.com

DATA IN. BRILLIANCE OUT.

Visualize and Share Your Data in Minutes—For Free

Enter your email address

Download the App

The screenshot shows a laptop screen displaying a Tableau Public interface. At the top, the text 'DATA IN. BRILLIANCE OUT.' is overlaid. Below it is a large play button icon. The background shows a data visualization with a bar chart and a table. At the bottom of the screen, there is a sign-up form with a text input field labeled 'Enter your email address' and an orange button labeled 'Download the App'.


**Enter
your
Email**



Available for Windows and Mac | [Privacy Policy](#)



Create Tableau Public Profile to Share Your Work

- Tableau Public: public.tableau.com
- Right upper corner: 
- Create profile

+tableau+public

Email

Password

☐ Keep me signed in

Sign In

[Forgot your password?](#)

Create



Don't have a profile yet?
[Create one now for free](#)

Create a Profile ×

Name
Real names are important to us and build a sense of community.

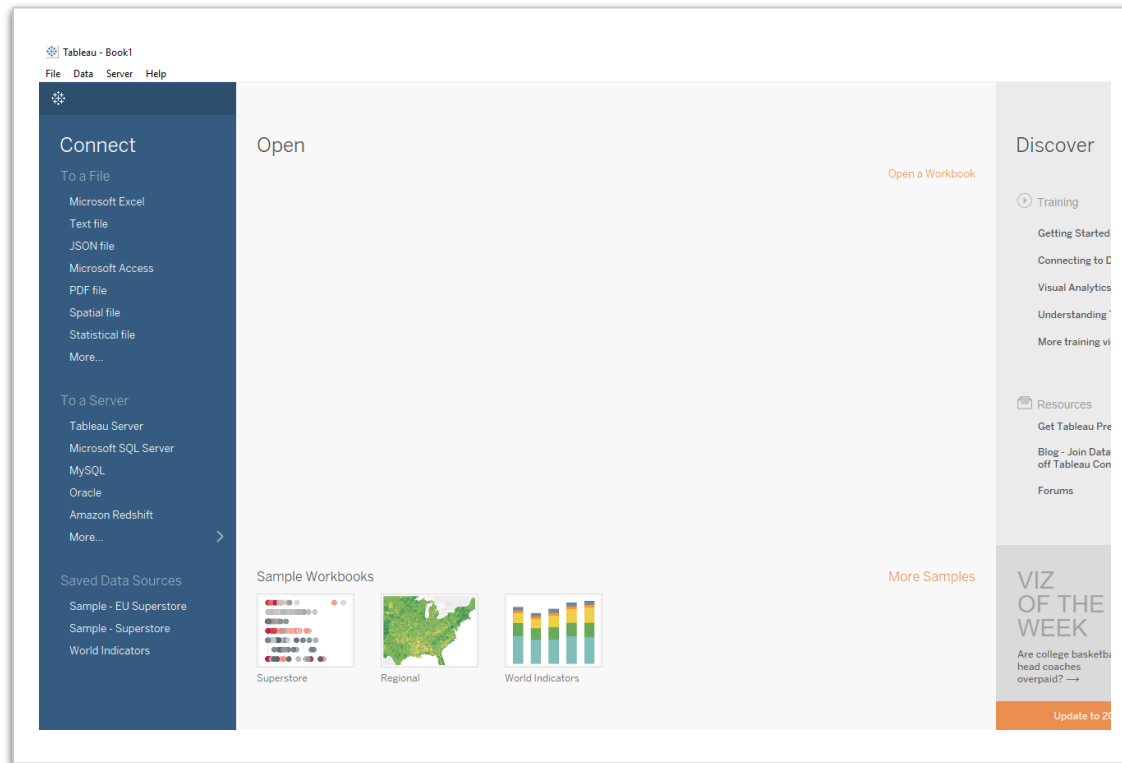
Email
Use your email to sign in to Tableau Public. Nobody sees this but us. We promise never to rent, sell, or barter your personal information to anyone.

Password
Must be a minimum of 8 characters and contain alphabetic, numeric and special characters.

Confirm

Review the Legal
☐ I've read and agree to the Terms of Service

Create My Profile



Open Tableau!

If you see above picture, you are ready to go!

Build Your Own Data Visualization in Tableau

Ethiopia HIV Prevalence





Data

- Understand data and make data useful

Today:

- Data cleaning



Visualize

- Choose the right visualization format

Today:

- Line chart
- Choropleth map
- Dashboard



Share

- Share your work for public good

Tomorrow:

- Publish to Tableau public
- Share on CGDV



About the Data



- HIV Prevalence in Ethiopia from 1992 to 2017
- Population: Adult Age 15 - 49
- Data source: UNAIDS
- aidsinfo.unaids.org
- Example data:
<https://github.com/CGDV/CGDV.github.io/tree/master/workshop/Tableau/data>



Data Cleaning

- **Tidy Data** (by Hadley Wickham)

1. Each **variable** is stored in its own **column**
2. Each **observation** is stored in its own **row**

- **Why Tidy Data?**

1. Easy to access variables
2. Automatically preserves observations
3. Data is quickly excluded during filtering

	A	B	C	D	E	F	G	H	I	J
1	Region	1992	1993	1994	1995	1996	1997	1998	1999	2000
2	Addis Ababa	8.6	9.8	10.8	11.6	12.1	12.3	12.2	12	11.5
3	Afar	3.5	3.9	4.3	4.6	4.8	4.9	4.9	4.8	4.6
4	Amhara	3.4	3.9	4.3	4.6	4.9	5	5	4.9	4.7
5	Beneshangul Gumuz	1.4	1.7	1.9	2.1	2.3	2.4	2.5	2.5	2.5
6	Dire Dawa	6.5	7.3	8	8.6	9	9.3	9.3	9.2	8.9
7	Gambella	5.6	6.8	7.9	9	9.7	10.2	10.5	10.6	10.3
8	Harari	4.8	5.4	5.9	6.3	6.5	6.5	6.4	6.2	5.8
9	Oromiya	1.6	1.8	2	2.2	2.3	2.3	2.4	2.3	2.2
10	SNNPR	0.5	0.6	0.7	0.8	0.8	0.9	0.9	0.9	0.9
11	Somali	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5
12	Tigray	3.4	3.9	4.4	4.8	5	5.2	5.2	5	4.8
13	National	2.6	2.9	3.2	3.4	3.6	3.6	3.6	3.5	3.4



	A	B	C
1	Region	Year	HIV Prevalence
2	Addis Ababa	1992	8.6%
3	Afar	1992	3.5%
4	Amhara	1992	3.4%
5	Beneshangul Gumuz	1992	1.4%
6	Dire Dawa	1992	6.5%
7	Gambella	1992	5.6%
8	Harari	1992	4.8%
9	Oromiya	1992	1.6%
10	SNNPR	1992	0.5%
11	Somali	1992	0.4%
12	Tigray	1992	3.4%
13	National	1992	2.6%
14	Addis Ababa	1993	9.8%
15	Afar	1993	3.9%
16	Amhara	1993	3.9%
17	Beneshangul Gumuz	1993	1.7%
18	Dire Dawa	1993	7.3%
19	Gambella	1993	6.8%
20	Harari	1993	5.4%
21	Oromiya	1993	1.8%
22	SNNPR	1993	0.6%
23	Somali	1993	0.4%
24	Tigray	1993	3.9%
25	National	1993	2.9%



Import Data to Tableau

Tableau - Book1
File Data Server Help

1

Connect

To a File

- Microsoft Excel
- Text file
- JSON file
- Microsoft Access
- PDF file
- Spatial file
- Statistical file
- More...

To a Server

- Tableau Server
- Microsoft SQL Server
- MySQL
- Oracle
- Amazon Redshift
- More...

Saved Data Sources

- Sample - EU Superstore
- Sample - Superstore
- World Indicators

2

Open a Workbook

Open

File name: HIV Prevalence Clean

Excel Workbooks (*.xls *.xlsx *.xl*)

Open Cancel

Discover

Training

- Getting Started
- Connecting to Data
- Visual Analytics
- Understanding Tableau
- More training videos...

Resources

- Get Tableau Prep
- Blog - Applications are open! Why you should apply today to speak at TC19
- Forums

More Samples

Sample Workbooks

- Superstore
- Regional
- World Indicators

VIZ OF THE WEEK

Are college basketball head coaches overpaid? →

Update to 2019.1.2 Now



Choose Right Data Type

Sort fields Data source order

ABC	#	#
HIV	HIV	HIV
Region	Year	HIV Prevalence
Addis Ababa	1992	0.086000
Afar	1992	0.035000

Region

ABC	#	#
HIV	HIV	HIV
Region	Year	HIV Prevalence
Addis Ababa	1992	0.086000
Afar	1992	0.035000
Amhara	1992	0.034000
Benishangul-Gumuz	1992	0.014000
Borena-Afar	1992	0.065000
Burkina Faso		
Harari		
Oromiya		
SNNPR		
Somali		
Tigray		
National		
Addis Ababa		
Afar	1993	0.039000
Amhara	1993	0.039000

ABC
HIV
Region



ABC
HIV
Region

Year

#	#
HIV	HIV
Year	Year
1992	0.056

HIV
Year



HIV
Year

Let's Visualize Data!

280 ● CHART A
158 ● CHART B
118 ● CHART D
139 ● CHART D



Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed diam nonummy nibh euismod tincidunt ut laoreet dolore magna aliquam erat volutpat. Ut wisi enim ad minim veniam, quis nostrud exerci



Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed diam nonummy nibh euismod tincidunt ut laoreet dolore magna aliquam erat volutpat. Ut wisi enim ad minim veniam, quis nostrud exerci



Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed diam nonummy nibh euismod tincidunt ut laoreet dolore magna aliquam erat volutpat. Ut wisi enim ad minim veniam, quis nostrud exercitation ullamcorper suscipit lobortis nisl ut aliquip ex ea commodo consequat. Duis autem vel eum irure dolor in





Tableau 101



- Sheet < Dashboard < Story
- Sheet: Single visualization
- Dashboard: Multiple sheets
- Story: Multiple sheets + dashboards

Tableau 101

Dimensions VS Measures

Dimensions:

- Level of detail
- How to want to separate data?
(location, date...)

Dimensions

Region

Year

Measure Names

Measures

- Aggregation
- How to want to calculate data?
(Average, count, ...)

Measures

HIV Prevalence

Latitude (generated)

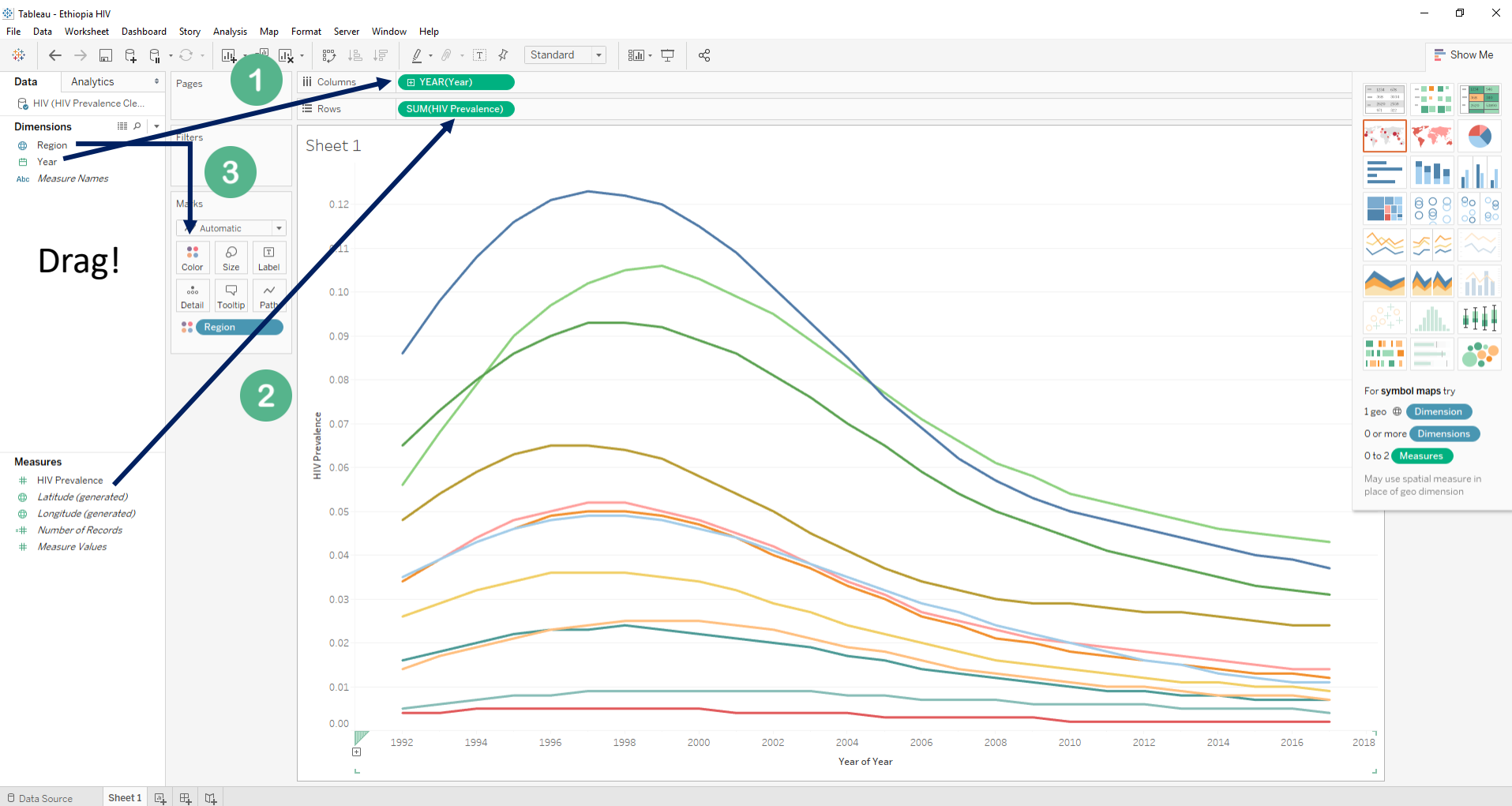
Longitude (generated)

Number of Records

Measure Values



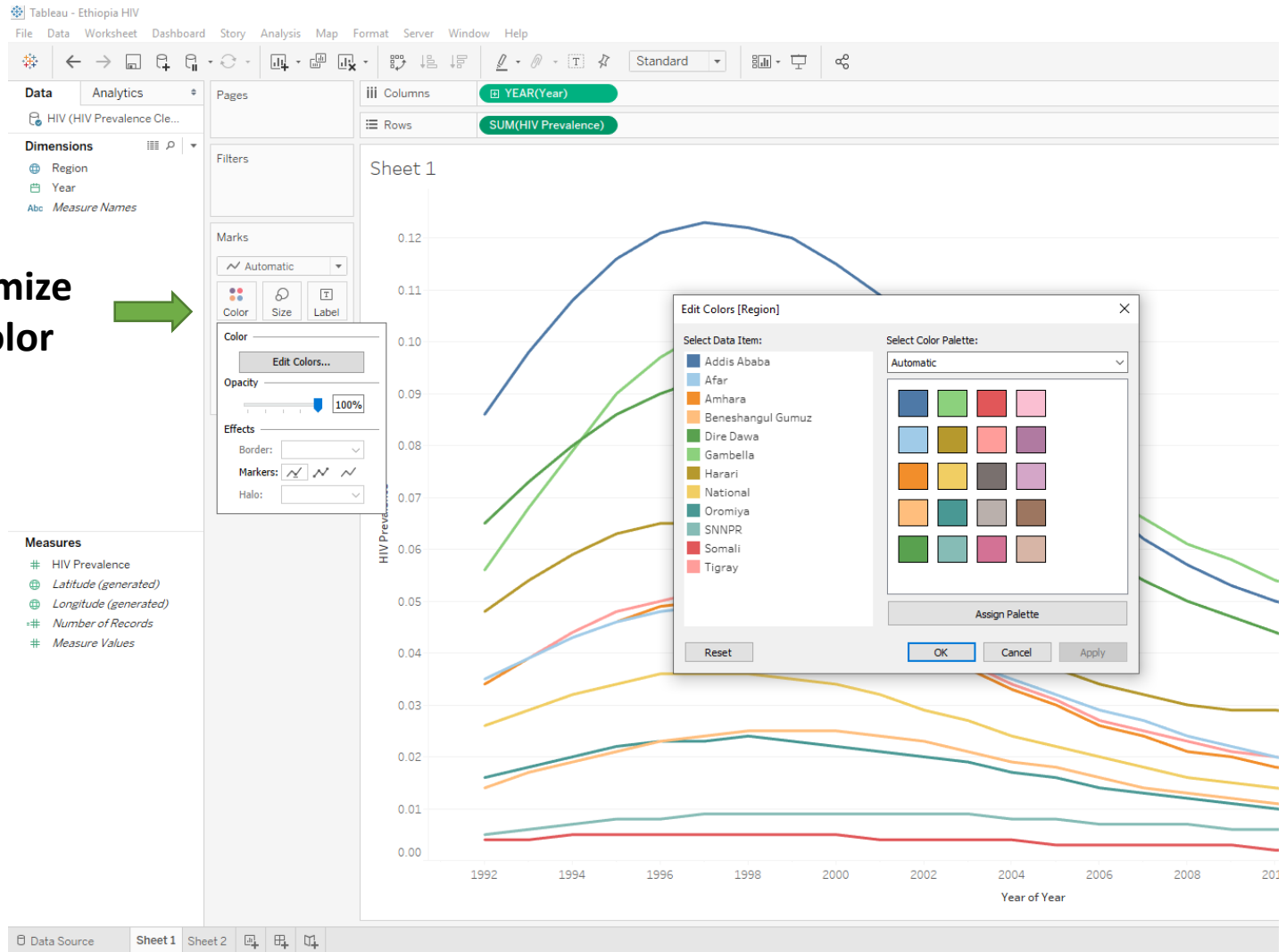
Line Chart





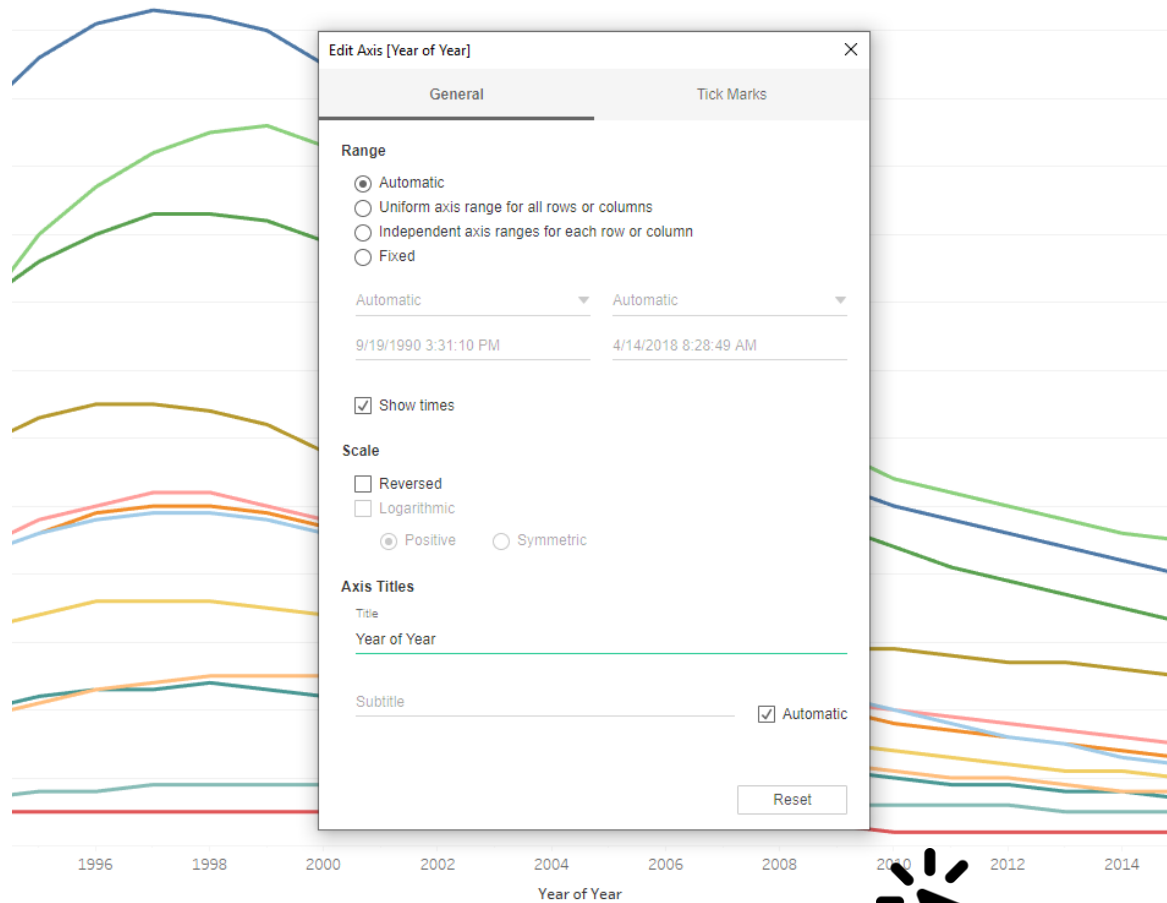
Customize Color

Customize
line color





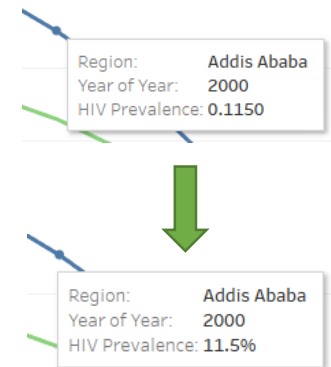
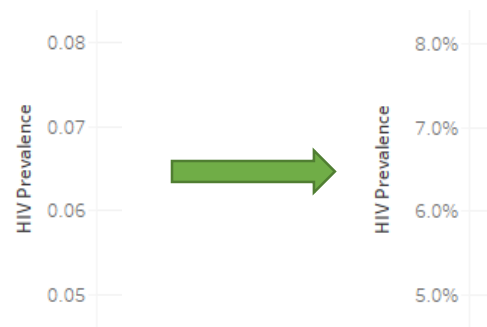
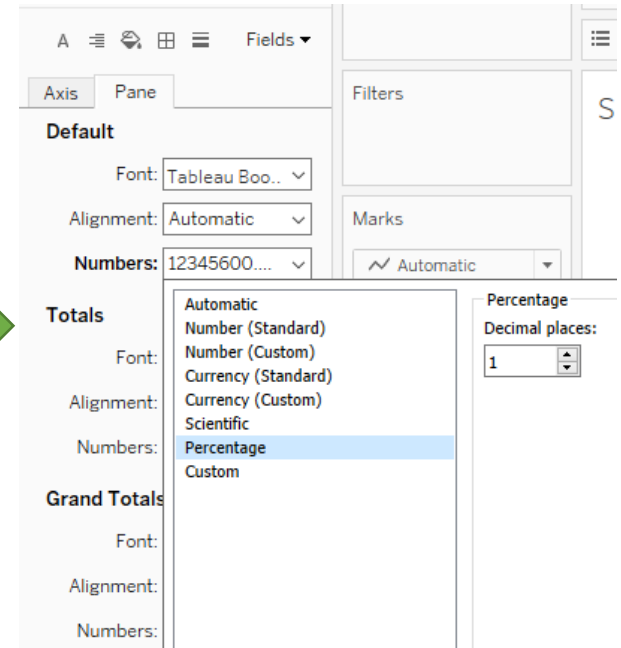
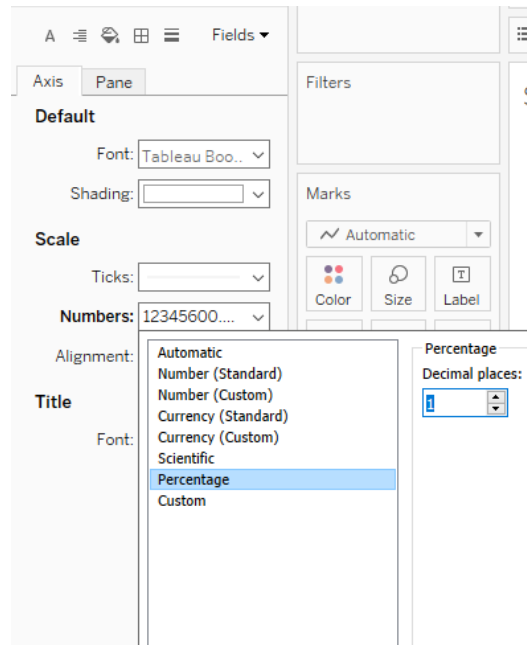
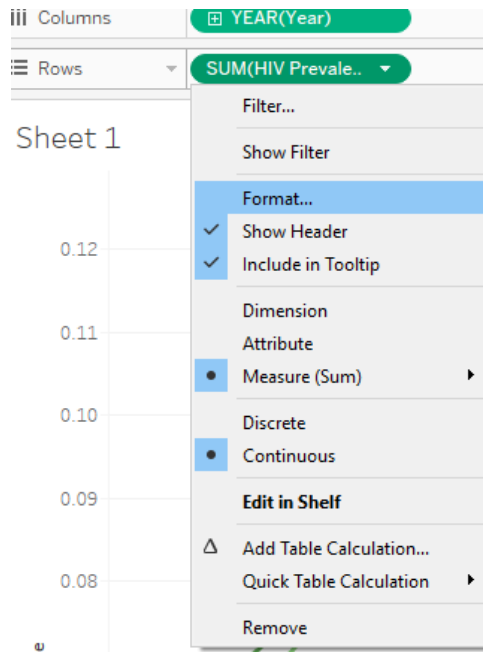
Customize Axis



Double click to edit axis



Show as Percentage





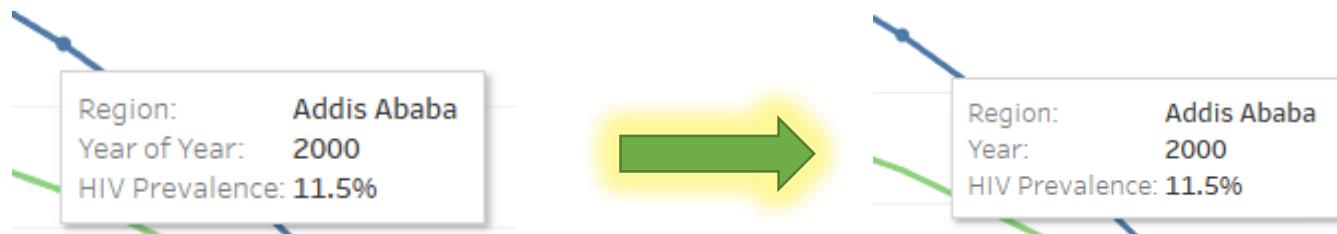
Customize Tooltip

Tableau Book | 10 | B | I | U | Insert | X

Region: <Region>
Year of Year: <YEAR(Year)>
HIV Prevalence: <SUM(HIV Prevalence)>

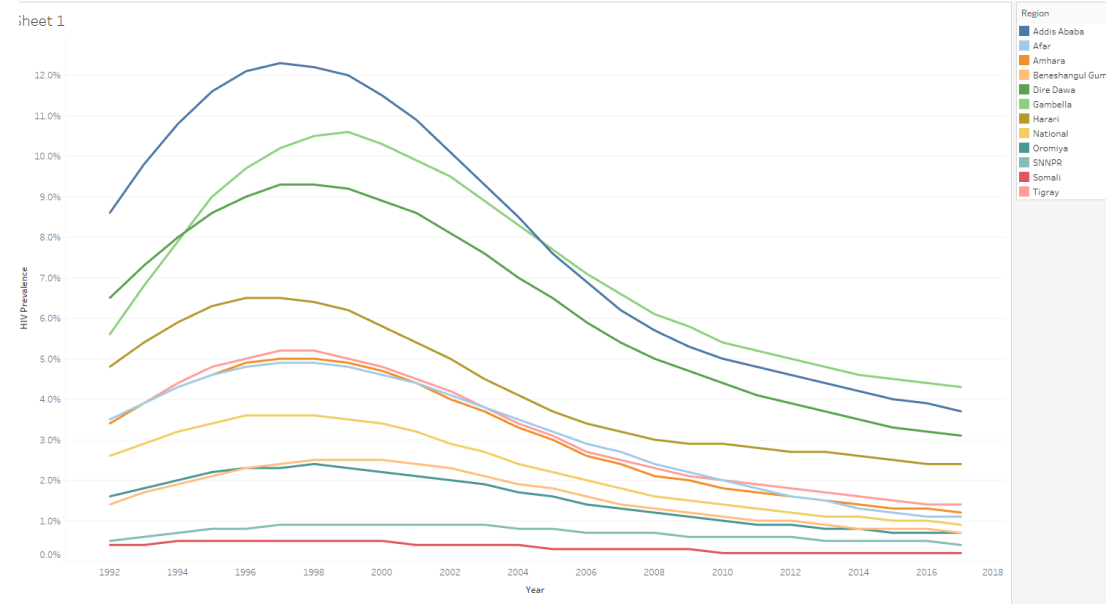
☒ Show tooltips Responsive - Show tooltips instantly
☒ Include command buttons
☒ Allow selection by category

Reset Preview OK Cancel



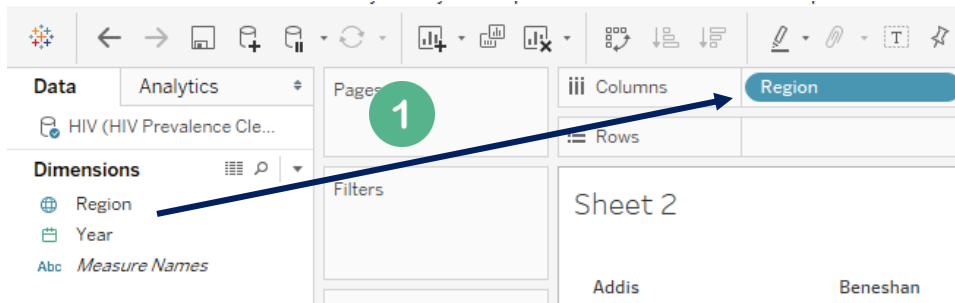


Line Chart Done!





Choropleth Map





Match Location

Why nothing on the map?

We have **unknown geographic locations!**



For symbol maps try

1 geo **Dimension**

0 or more **Dimensions**

0 to 2 **Measures**

May use spatial measure in place of geo dimension

etMap contributors

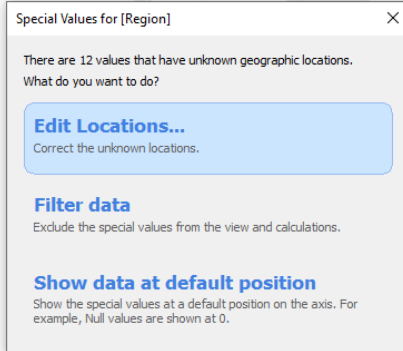
12 unknown

3

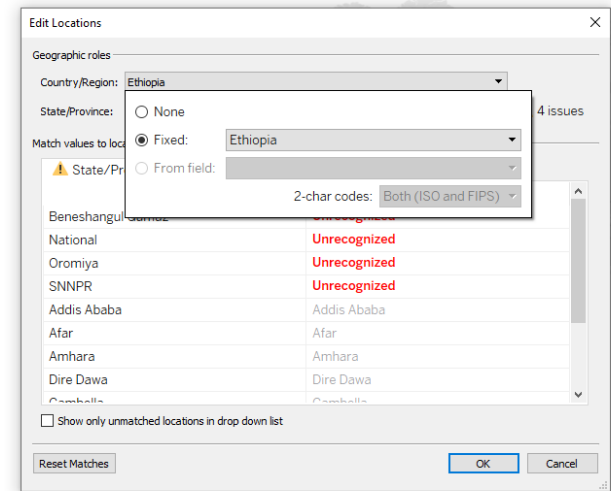




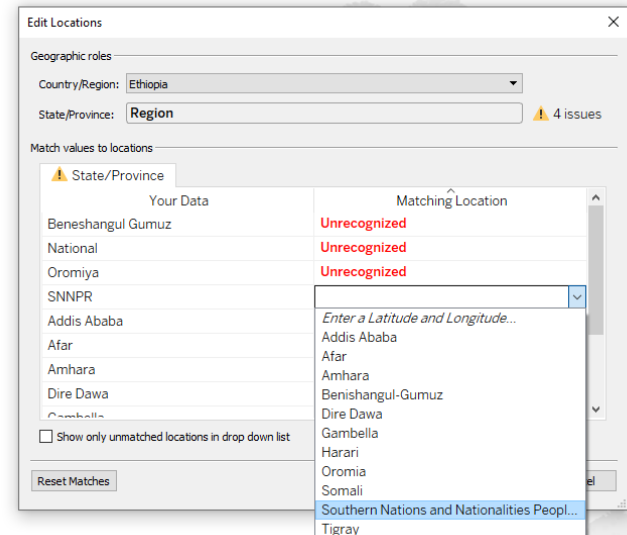
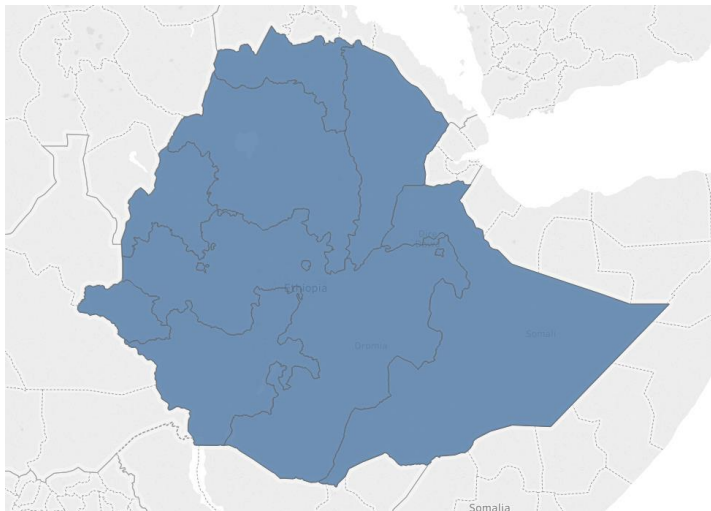
Edit Locations



Select Country



Match Unrecognized Region

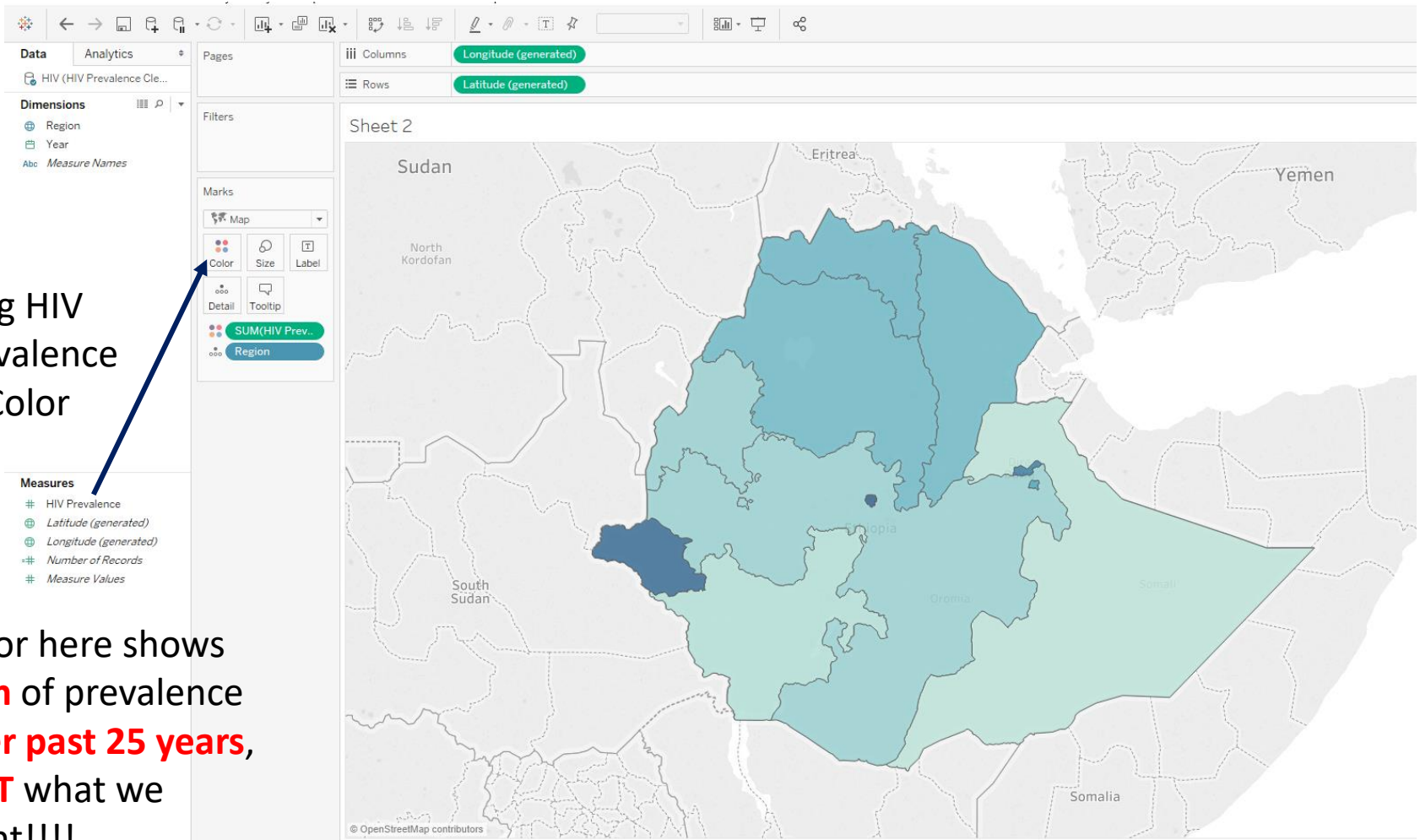




Color

Drag HIV
Prevalence
to Color

Color here shows
sum of prevalence
over past 25 years,
NOT what we
want!!!!





Filter by Year

Tableau - Ethiopia HIV

File Data Worksheet Dashboard Story Analysis Map Format Server Window Help

Data Analytics

HIV (HIV Prevalence Cle...

Dimensions

Region

Year

ABC Measure Names

Filters

Columns Longitude (generated)

Rows Latitude (generated)

Sheet 2

Sudan

North Kordofan

Eritrea

South Sudan

© OpenStreetMap contributors

Drag Year to Filter

Map

Color

Size

Label

Detail

Tooltip

SUM(HIV Prev...

Region

Measures

HIV Prevalence

Latitude (generated)

Longitude (generated)

Number of Records

Measure Values

Choose single year
you want to visualize

Filter [Year of Year]

General Condition Top

☒ Select from list ☐ Custom value list ☐ Use all

Enter search text

☐ 2007

☐ 2008

☐ 2009

☐ 2010

☐ 2011

☐ 2012

☐ 2013

☐ 2014

☐ 2015

☐ 2016

☒ 2017

All None ☐ Exclude

Summary

Field: [Year of Year]

Selection: Selected 1 of 26 values

Wildcard: All

Condition: None

Limit: None

☐ Filter to latest date value when workbook is opened

Reset OK Cancel Apply



Customize Color

1

2 Choose Palette

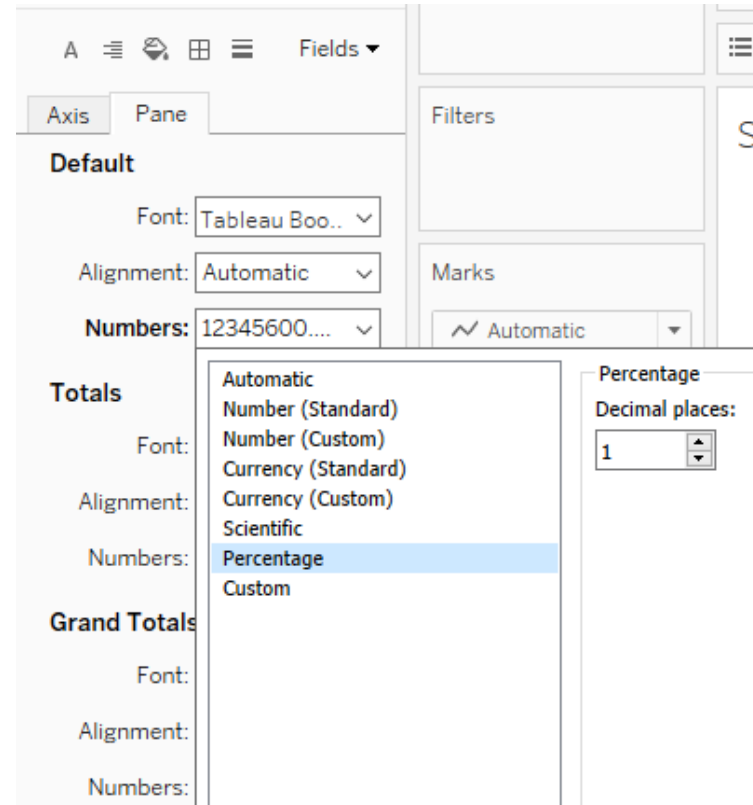
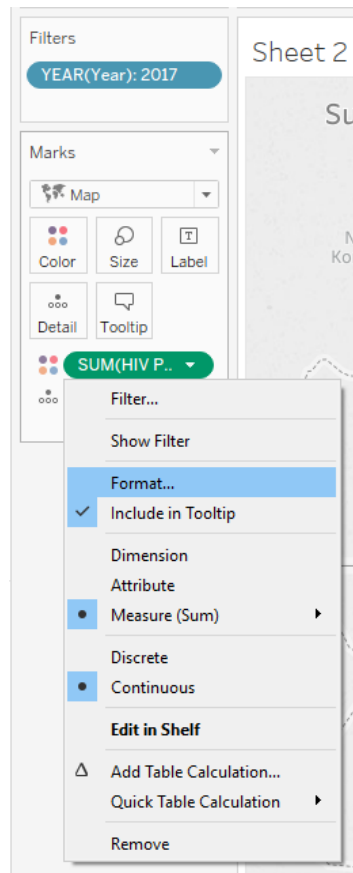
3 In Advanced, fix value range

The screenshot shows the QGIS interface with a map of Sudan and surrounding regions. The 'Edit Colors' dialog box is open, showing a color palette for 'HIV Prevalence'. The 'Advanced' tab is selected, and the 'Start' and 'End' values are fixed at 0 and 0.12, respectively. The 'OK' button is highlighted.

© OpenStreetMap contributors



Show as Percentage

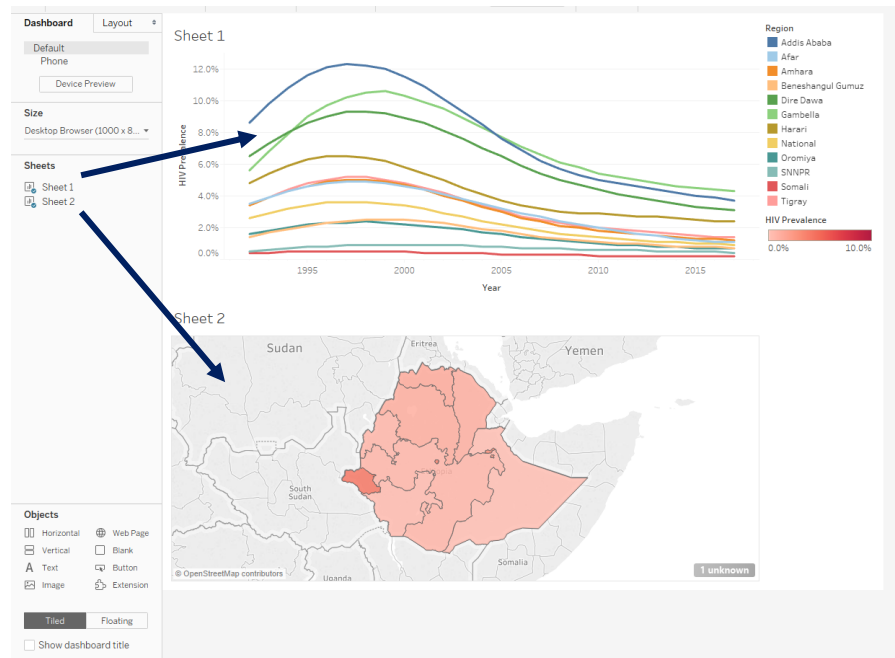






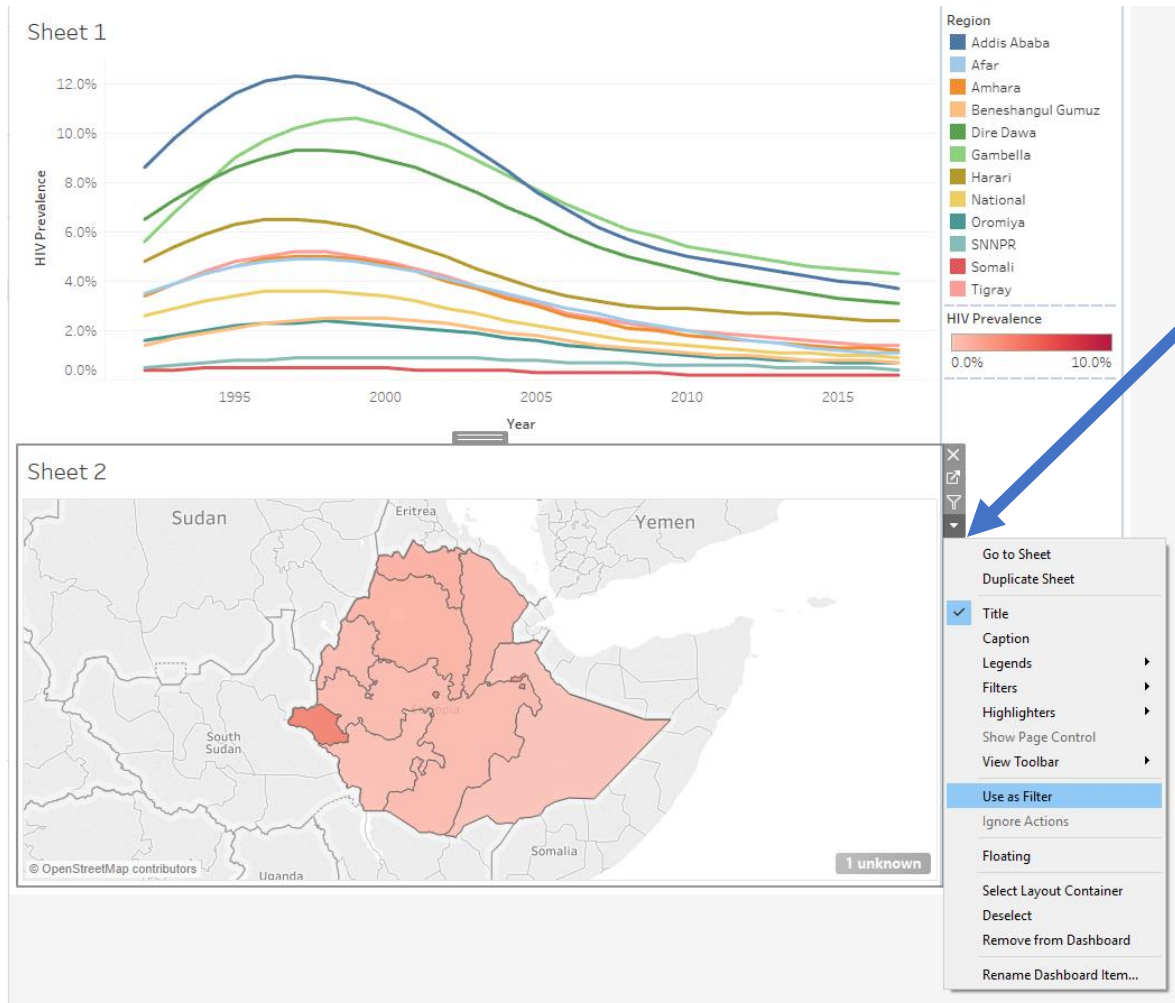
Dashboard

- Create a new dashboard tab
- Drag both sheets to dashboard





Connect Chart

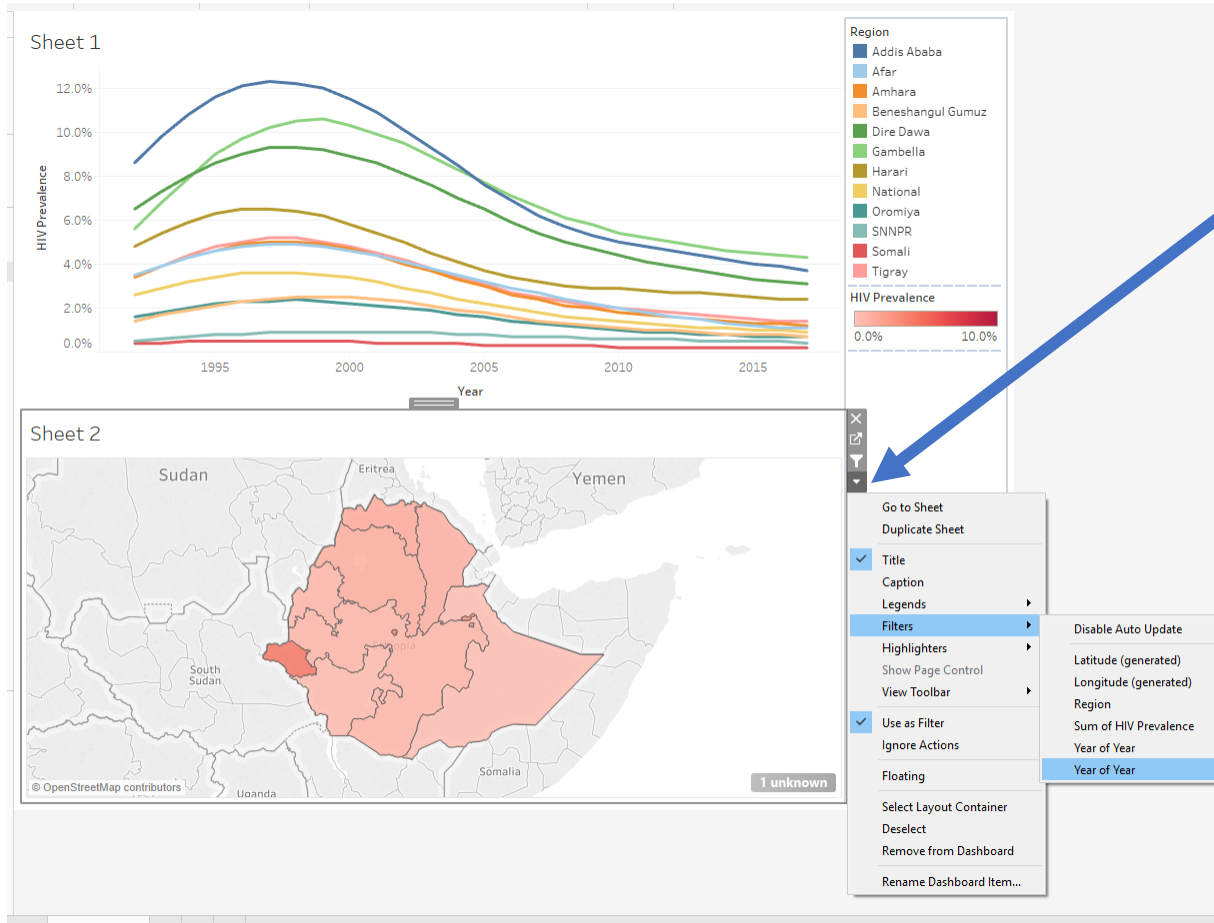


- More options
- Use as Filter

Now when you click on a region, the first chart also change!



Add Time Slider



- More options
- Filters
- Year of Year



Add year filter

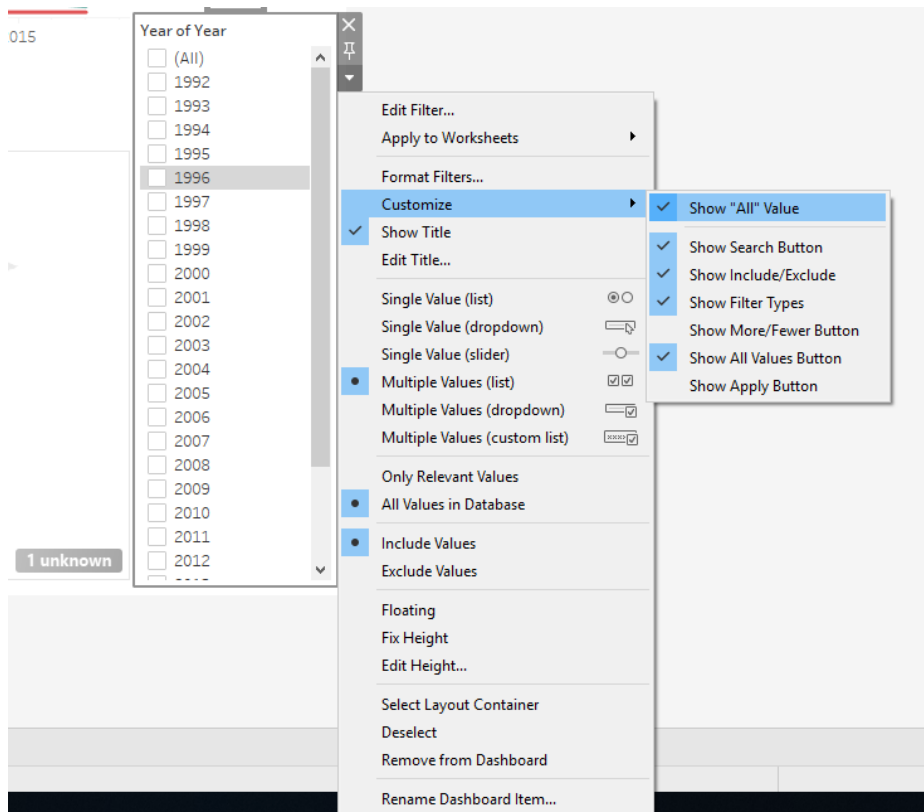
Year of Year

- ☐ (All)
- ☐ 1992
- ☐ 1993
- ☐ 1994
- ☐ 1995
- ☐ 1996
- ☐ 1997
- ☐ 1998
- ☐ 1999

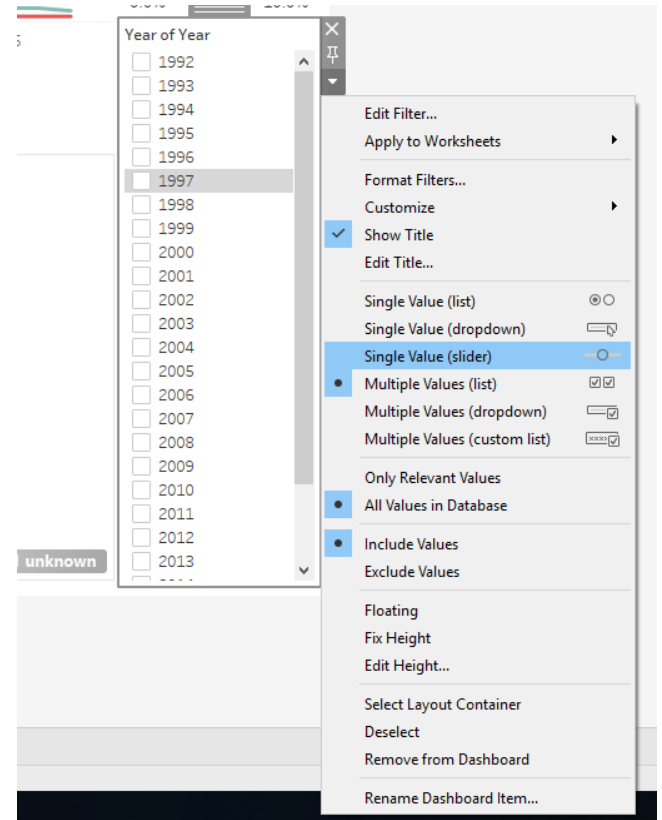




Add Time Slider



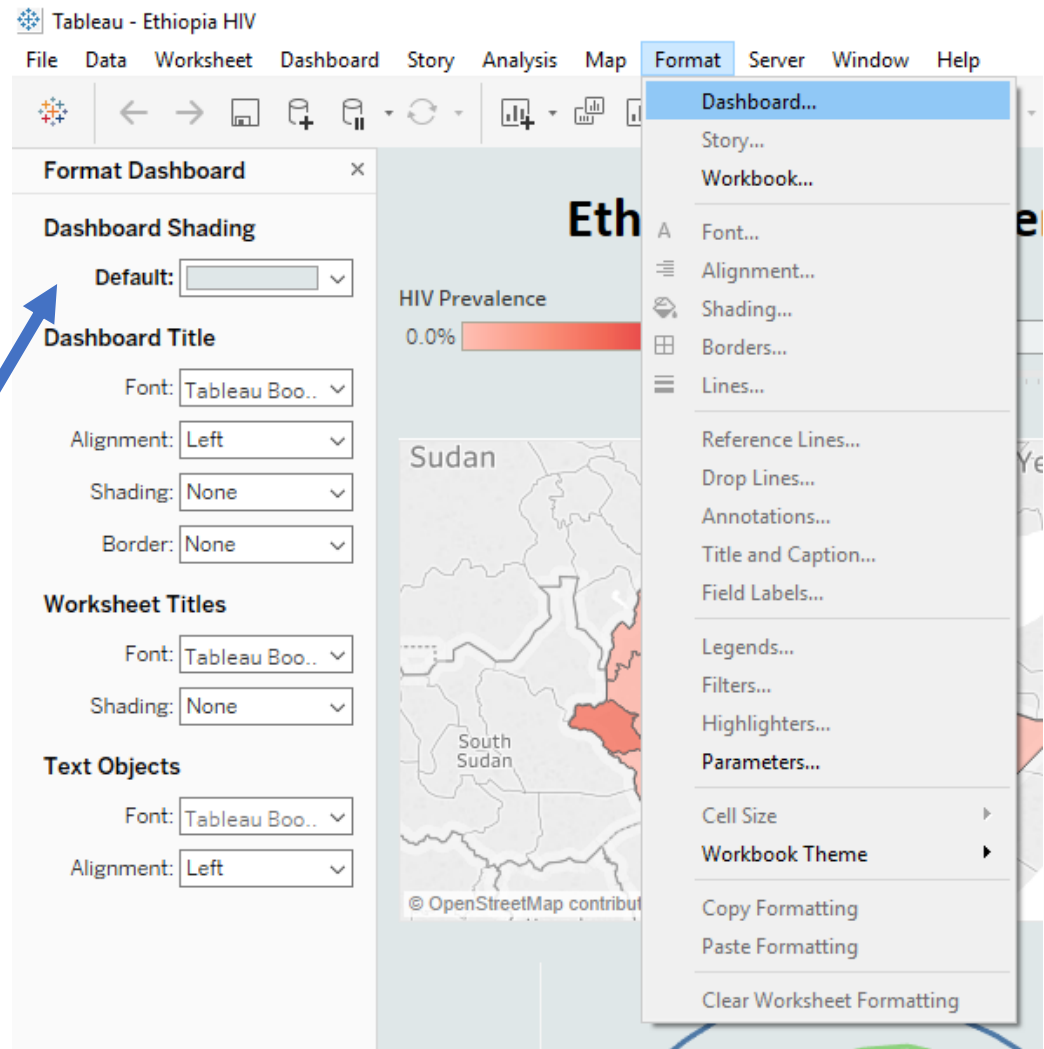
- More options
- Customize
- Uncheck Show “All” Value



- More options
- Single Value (slider)

Customize Content

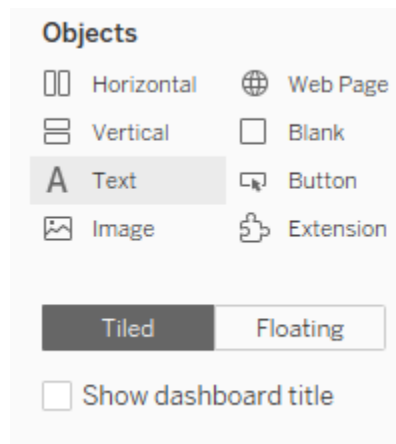
- Change dashboard background color
- Format -> Dashboard -> Dashboard Shading





Customize Content

- Modify Title by double clicking on the title
- Add object (text, image) by dragging object to dashboard





Customize Content

- How to add YouTube video?
- Drag a Webpage  Web Page to dashboard
- Enter your modified YouTube link

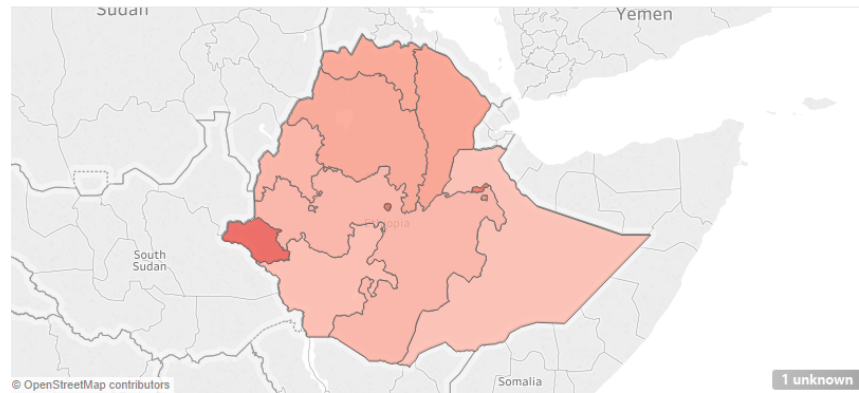
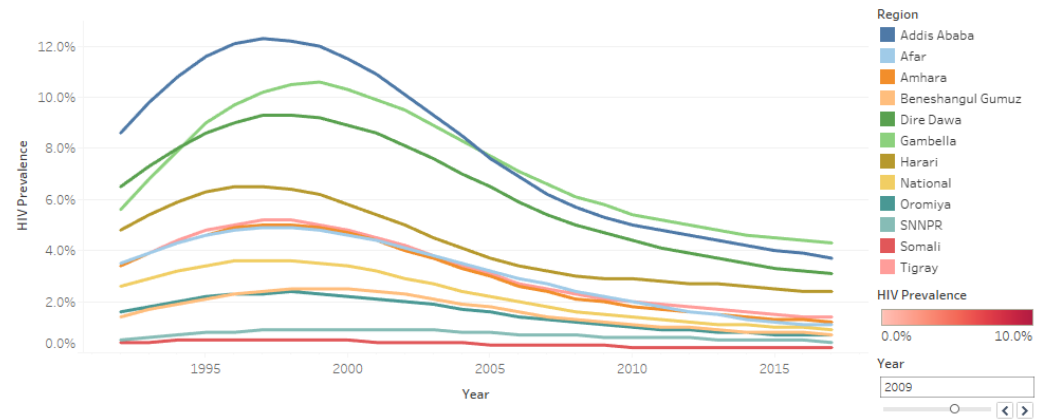
Before <https://www.youtube.com/watch?v=Mg43RbYsBho>



Keep ID and add “/embed/”

After <https://www.youtube.com/embed/Mg43RbYsBho>

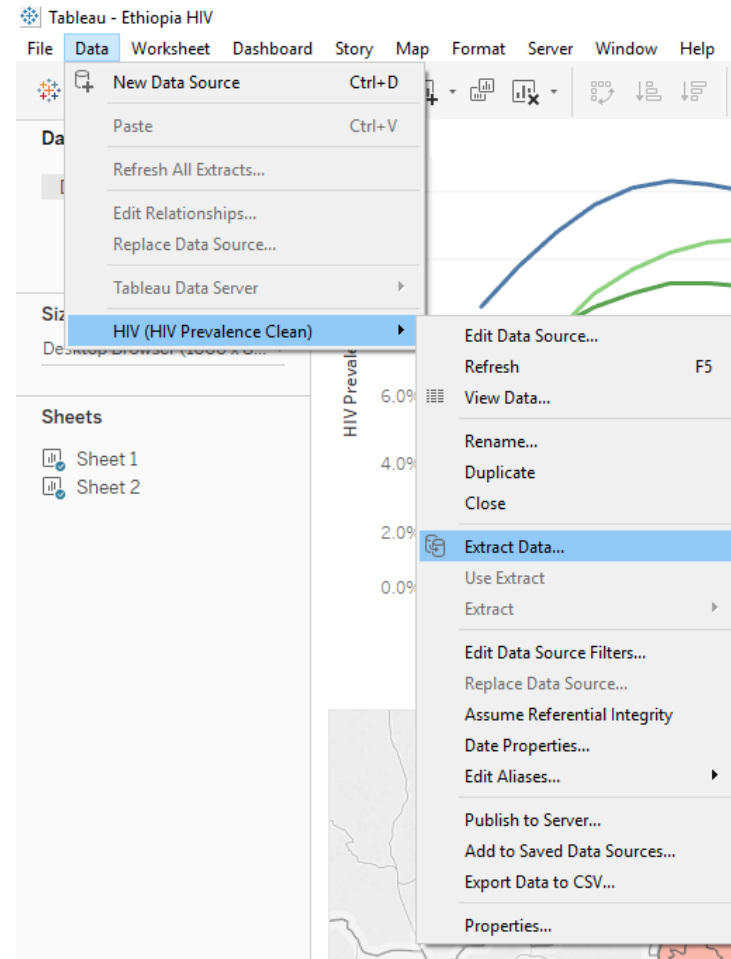
Dashboard Done!





Share Your Tableau Work (Tableau Desktop Only)

- Extract data:
 - Data
 - HIV
 - Extract Data





Share Your Tableau Work (Tableau Desktop Only)

- Extract data:

Extract Data

Specify how to store data in the extract:

Data Storage

☒ Single table ☐ Multiple tables

Store data in your extract together using a single table. [Learn more](#)

Use this option if you need to use extract filters, aggregation, top N, etc.

Specify how much data to extract:

Filters (optional)

Filter	Details
--------	---------

Add... Edit... Remove

Aggregation

☐ Aggregate data for visible dimensions

☐ Roll up dates to Year

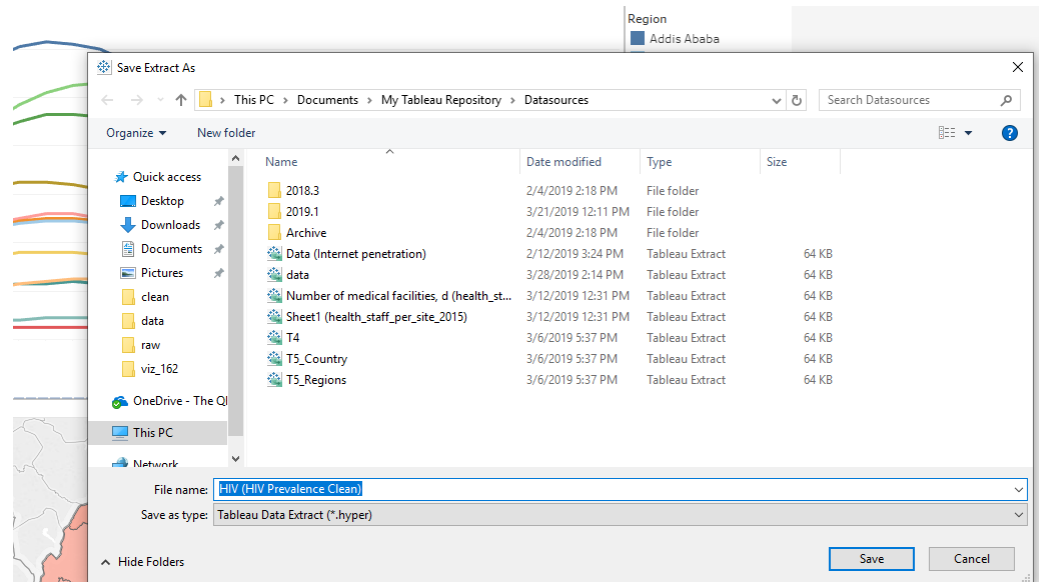
Number of Rows

☒ All rows ☐ Incremental refresh

☐ Top: rows

☐ Sample: rows

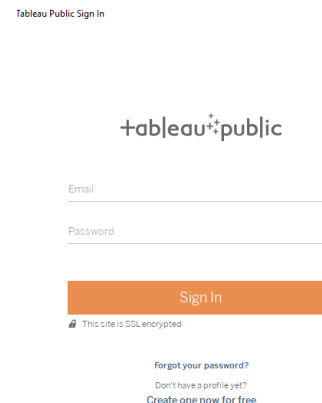
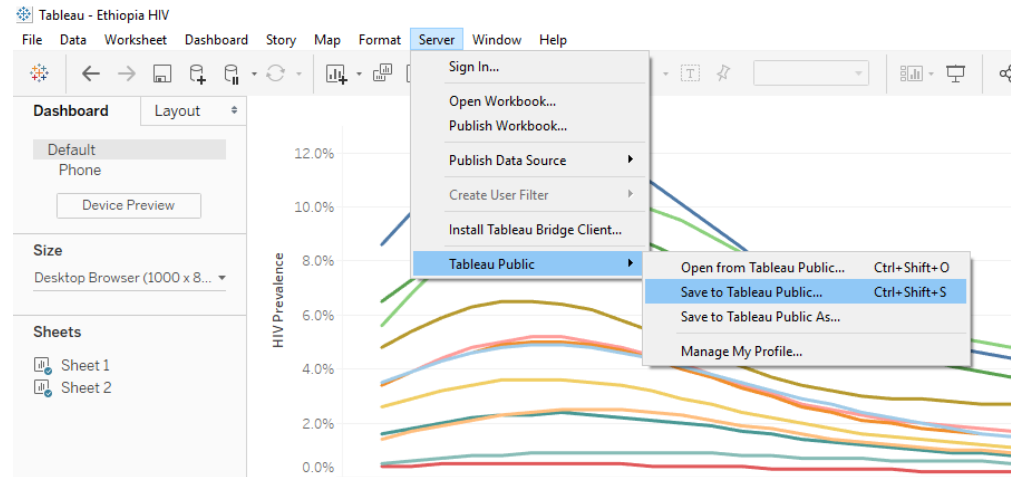
History... Hide All Unused Fields Extract Cancel

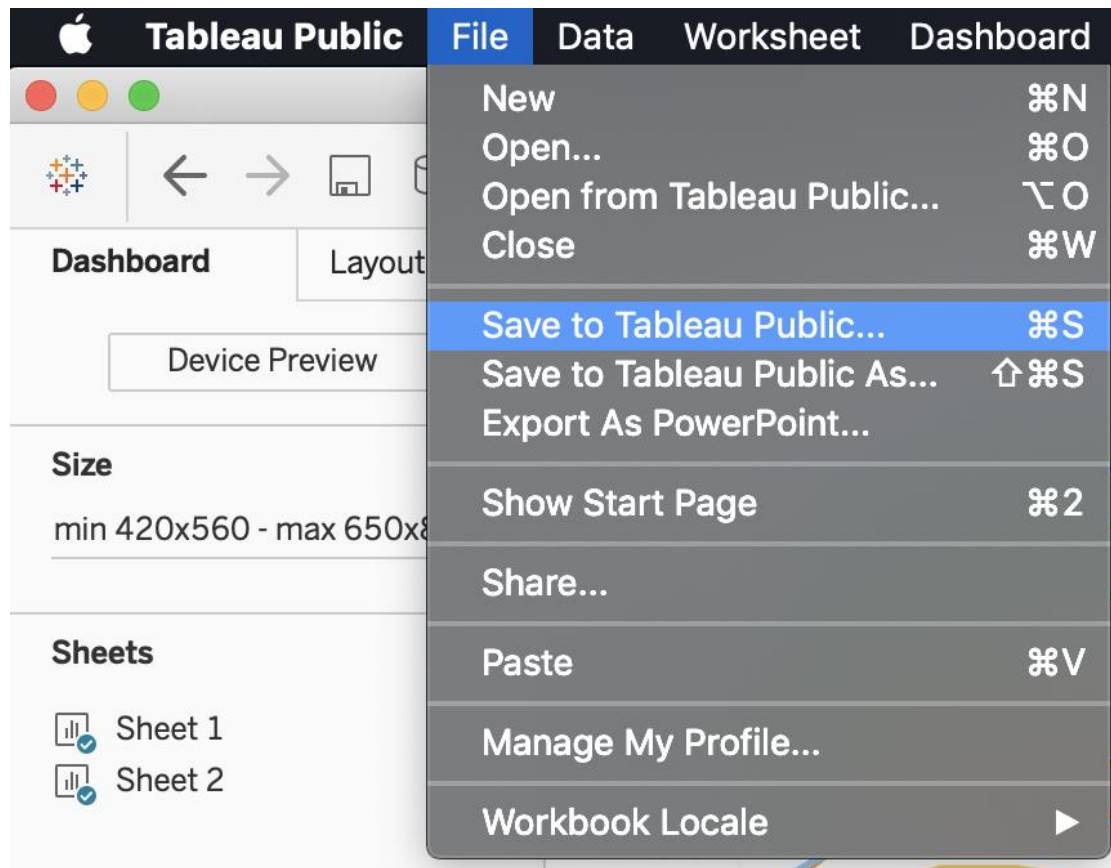




Share Your Tableau Work (Tableau Desktop Only)

- Publish:
 - Server
 - Tableau Public
 - Save to Tableau Public
 - Sign in your Tableau Public Account

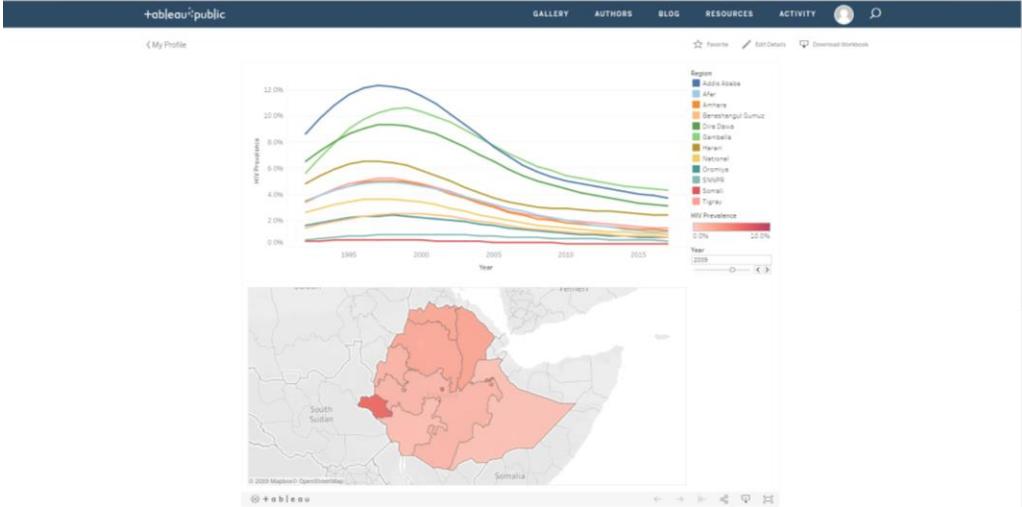




- Easy two steps!
- 1. "File" on the top
- 2. Save to Tableau Public

Share Your Tableau Work
(Tableau Public Only)

Your Work
is Public!





Share Your Tableau Work on CGDV

- Find share button under your Tableau visual



- Copy the Embed code when uploading visual on CGDV.

Share

×

Embed Code

ement, vizElement); </script>

Link

<https://public.tableau.com/views/Ethi>

<div>Visualization Title</div> <div>Title</div>	<div>Visualization Country</div> <div>Select Country</div>
<div>University or Organization</div> <div>Select University or Organization</div>	<div>Category</div> <div>Select category</div>
<div>Challenge</div> <div>Select Challenge</div>	<div>Data Source</div> <div>Data Source</div>
<div>Tags</div> <div>Add tags by comma seperated e.g. tag1,tag2</div>	
<div>Embed Code</div> <div>Add Embed Code</div>	

End of Module 1

