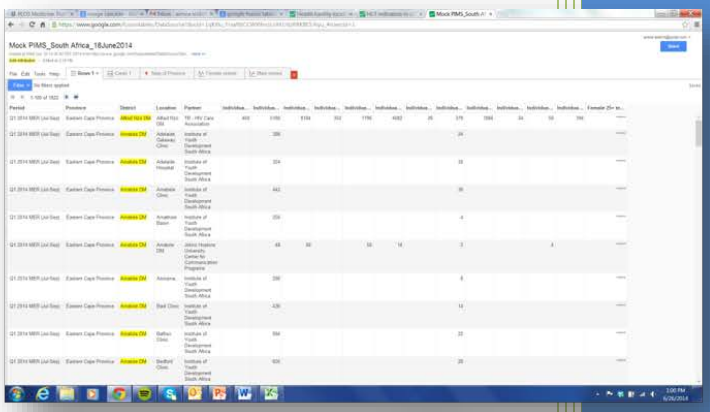
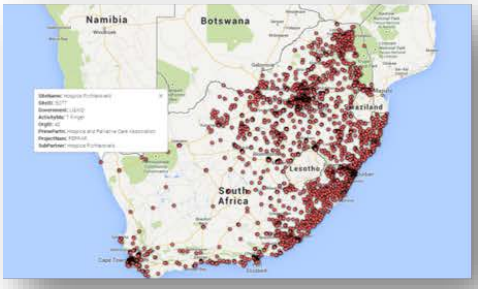
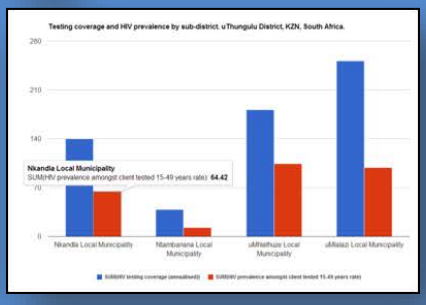
UCSF Global Health Sciences
Global Strategic Information

Google FusionTables for Global Health
User Manual







1. Introduction

This manual offers a systematic approach to using Google FusionTables as a tool for informing evidence-based strategic planning. Google FusionTables is a web-based, interactive worksheet that provides a powerful tool for summarizing large amounts of tabular data by:

i. Calculating totals, averages, medians, and counts based on source data
ii. Classifying data based on other fields in the source data
iii. Auto-generating charts
iv. Overlaying data on Google Maps

All of this information can be found on our website: https://datause.ucsf.edu/google-fusion-tables-health

Use Requirements

To use Google Fusion Tables, users will need basic operational knowledge of the computer, the internet and Microsoft Office Excel and must be connected to the internet.

- Access Google FusionTables: https://www.google.com/fusiontables/

Video Tutorials

Online video tutorials accompany each section of this manual. Select the link below to watch all videos as a series or select the video tutorial links within each section of this manual to view specific topics.

- Google Fusion Tables for Global Health Playlist: http://www.youtube.com/playlist?list=PLJJGPn3_vrpDueYPUBwTwrKhOIgVsy-Oy

2. Getting started with Google FusionTables

Video tutorial: https://www.youtube.com/watch?v=zqaHXrZsnUM

2.1. Setup

Before starting this manual users need a Google account (also known as a Gmail account), and access to the internet using the Chrome internet browser. If you do not already have a Google Chrome browser or Google account, do the following:

- Download Chrome: https://www.google.com/chrome/browser/
- Create a free Google account: https://accounts.google.com/SignUp

To demonstrate how to use this tool, we will follow an example using publically available ANC Sentinel Surveillance data from Mpumalanga Province in South Africa. These two datasets (1. District level data and 2. Health facility level data) and the necessary KML Mapping file (Keyhole Markup Language, a file format used to display geographic data on an earth browser such as Google Earth, Google Maps, et) can be downloaded from the UCSF Data Use Website here: https://datause.ucsf.edu/google-fusion-tables-health or from the following links:

- Health facility level data: http://bit.ly/1tgWN0H
- District level data: http://bit.ly/1yVI2BB
- KML Mapping file: http://bit.ly/1wmoSpn

2.2. Data Inputs

Data to be used in Google FusionTables must first be in a Microsoft Excel spreadsheet or Google Spreadsheet formatted with specific information in the rows (individual records displayed horizontally), columns (variables or indicators displayed vertically), and data items (contents within rows and columns) of the spreadsheet.

1. Enter data into Excel using the following format:

Row 1: Column Headers. Column headers should contain all components necessary to describe the data such as "*HIV Prevalence Females All Ages ANC 2010.*"At a minimum, the following should be included in the column header:

1. Indicator name (*e.g. HIV Prevalence*);
2. Sex (*e.g.Female*)
3. Age aggregation (*e.g.All ages, 15-24*);
4. Source and year *(e.g. ANC 2010)*

Tip: Each spreadsheet should contain data from only one geographic disaggregation. If you wish to work with more than one geographic aggregation, such as province level data in addition to district level data, create separate spreadsheets for each.

Rows 2 and above: Data elements/values

Column A: Geographic indicator (Province, district, sub-district, facility).

Columns B and above: Indicators or variables

	A	B	C	D	E	F
1	**District**	**HIV Prevalence Females All Ages ANC 2010**	**HIV Prevalence Females All Ages ANC 2011**	**HIV Prevalence Females All Ages ANC 2012**	**No. tested positive for HIV Females All Ages MOCK DATA**	**No. tested for HIV Females All Ages MOCK DATA**
2	Ehlanzeni	37.7	35.8	35.1	335726	699429
3	Gert Sibande	38.8	46.1	40.5	118702	211967
4	Nkangala	27.2	29.6	32.1	199879	444175
5						

2. Save your file with a name and location that is easy to remember. For example, a file containing ANC Surveillance HIV prevalence data from Mpumalanga province in South Africa may be called “ANC HIV Prevalence Mpumalanga 2010-2012” and saved to your desktop.

2.3. *Importing data into Google FusionTables*

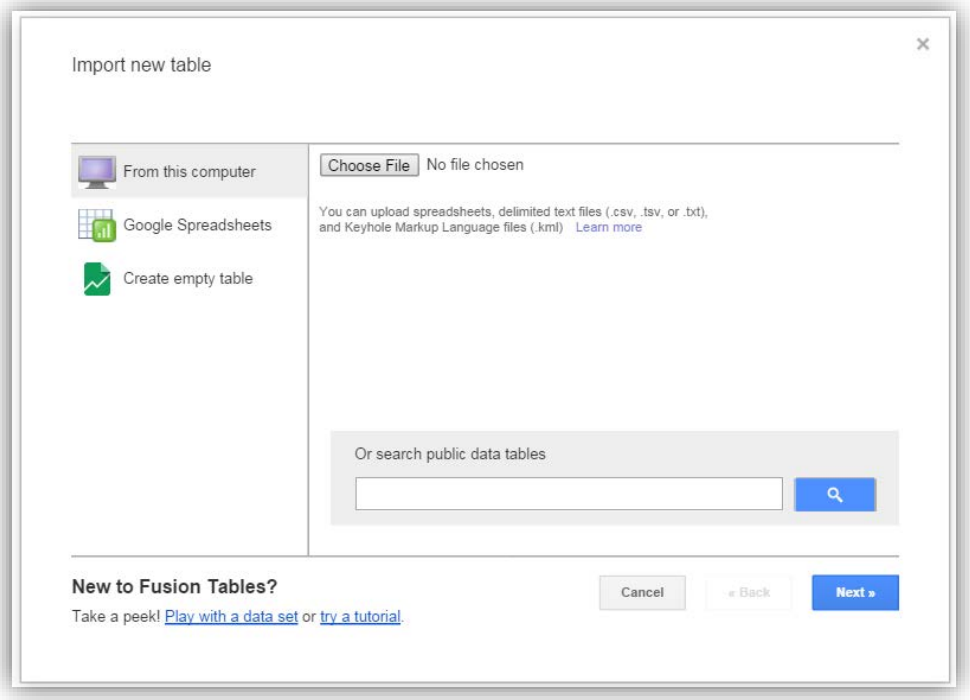
Video tutorial: https://www.youtube.com/watch?v=fjtrsGhzA1I

To import data into Google Fusion Table, execute the following steps:

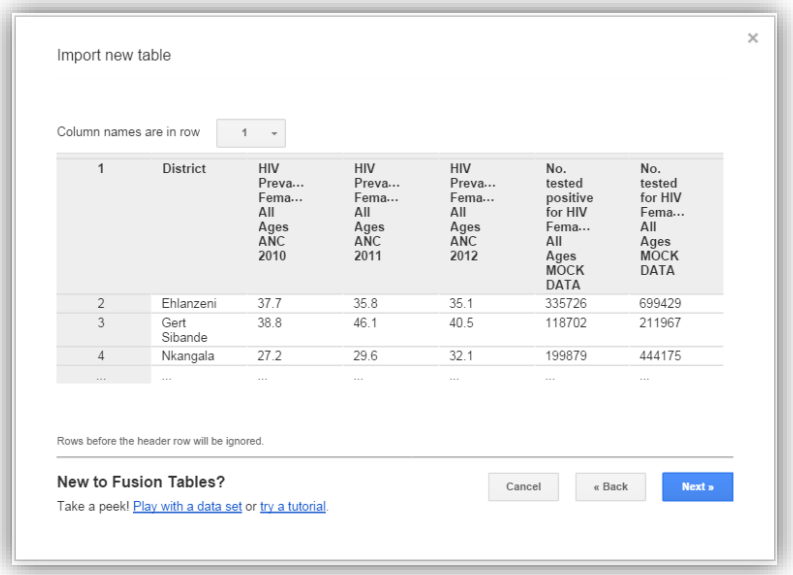
1. Visit https://www.google.com/fusiontables/
2. Select 'Create a Fusion Table'

Tip: You must be logged into your Google or Gmail account prior to working in Google FusionTables.

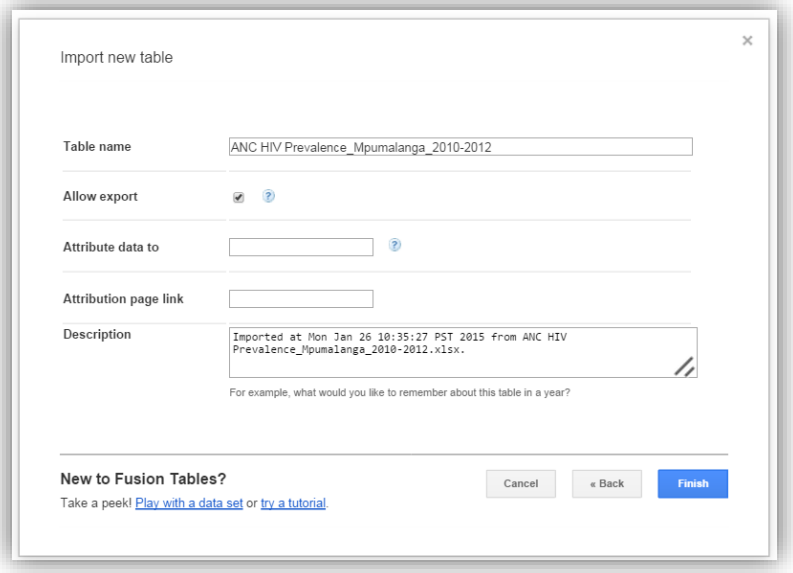
The 'Import new table' dialog box appears.



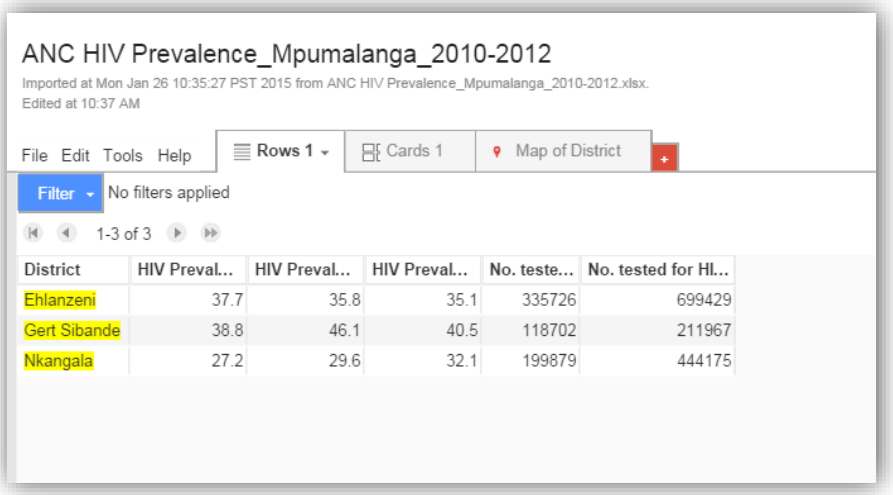
3. Select From this computer
4. Browse to find the Excel data file you wish to import (e.g., ANC HIV Prevalence_Mpumalanga_2010-2012)
5. The spreadsheet should appear. Select 'Next'



6. Name your table under Table Name and write a description. Select 'Next'

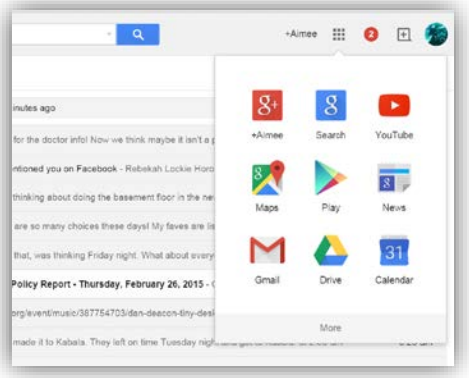


Your dataset will appear in the Google Fusion Table application. Repeat this step as necessary until all files to be used in Google FusionTables have been imported (e.g., KML Files, other datasets).

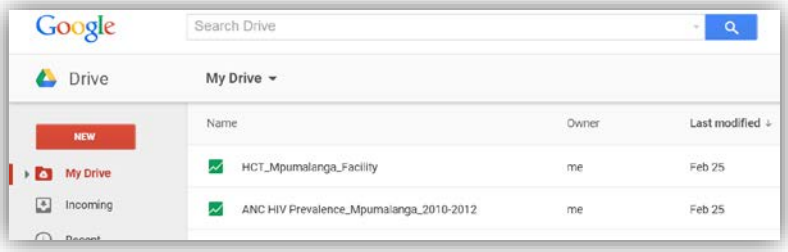


After you have imported your Fusion Table, you can return to Google Fusion Tables and access it through your Google Drive account. To do this:

1. Select 'Drive' from the Apps in your Gmail account



2. Select the FusionTable (distinguished by the icon) that you wish to view from the list



2.4. Calculating Formulas

Video tutorial: https://youtu.be/X_m2wTKyEIY

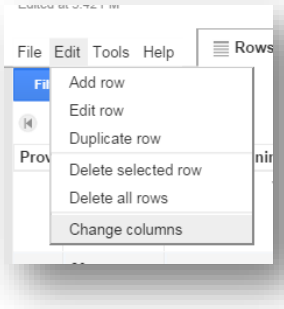
Formulas can be created by adding an additional indicator that calculates a formula using data from indicators already in your dataset or other values. For example if we wish to calculate the HIV testing yield from our data, we will write the following formula:

'number tested positive for HIV'/'number tested for HIV'

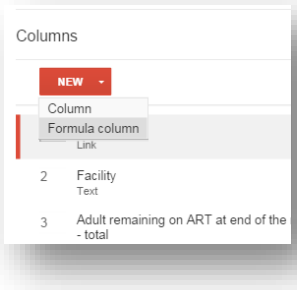
To do this, execute the following steps:

> **Tip**: If you are working in a merged file, you will not be able to Add formula column. See *Downloading a dataset* for information on how to download and import a merged FusionTable to regain full function.

1. Select 'Edit' from the menu
2. Select 'Change Columns'



3. Select New and then Formula column



4. Enter a name for your new indicator (e.g. *HIV Testing Yield*).

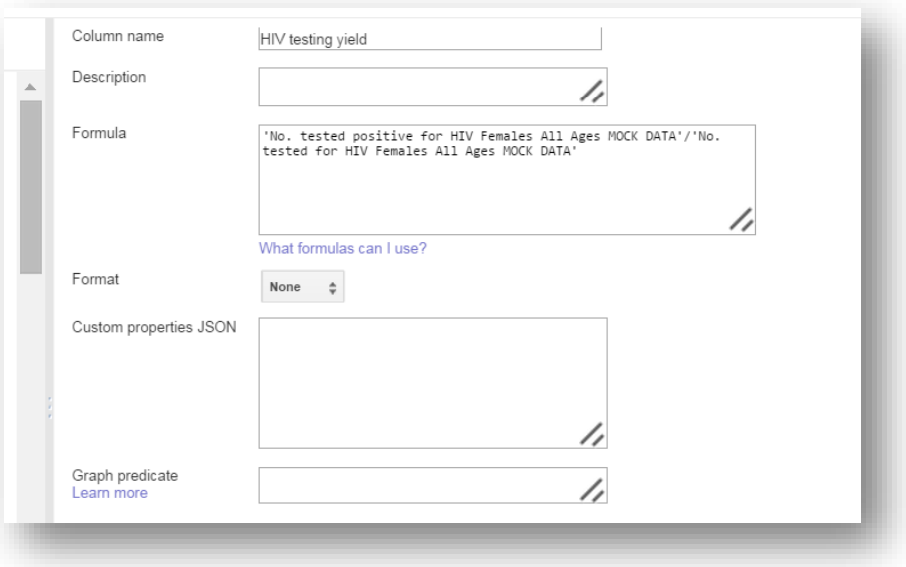
5. Enter a description of this new indicator, if applicable
6. Enter the formula to be calculated.

In order to include data from pre-existing indicators in your formula, you must copy the original indicator name exactly as it appears in the dataset and paste it into the formula, wrapped in apostrophes. To do this:

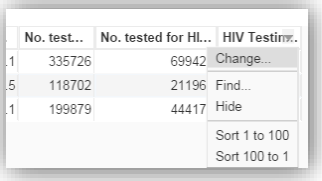
Tip: Formulas should be formatted similar to Excel. They can include pre-existing indicators from your dataset and/or other values. See this link for more information on creating formulas in FusionTables: https://support.google.com/fusiontables/answer/178196?hl=en

a. Select the indicator you wish to include in your formula from the list on the left. The name of this indicator should now appear in the Right side of the window.
b. Highlight and copy the indicator name listed in the Right side of the window
c. Select the new indicator you just created from the list on the left side of the window
d. Place your cursor in the Formula window on the Right side of the window, type an apostrophe, paste the indicator name, and type another apostrophe (e.g.,)
e. Add any other characters necessary for your formula such as + / - * or other values
f. Continue these steps until you have written a complete formula.

7. Click 'Save'



8. Your new indicator will now appear in your Google FusionTable dataset. If you see asterisks ('****') in the New Indicator column in your dataset, there is an error in your formula. Click on the indicator name and select 'Change' to edit the formula.


No. test...
No. tested for HI...
HIV Testin...
335726
69942
118702
21196
199879
44417
Change...
Find...
Hide
Sort 1 to 100
Sort 100 to 1

3. Visualizing data

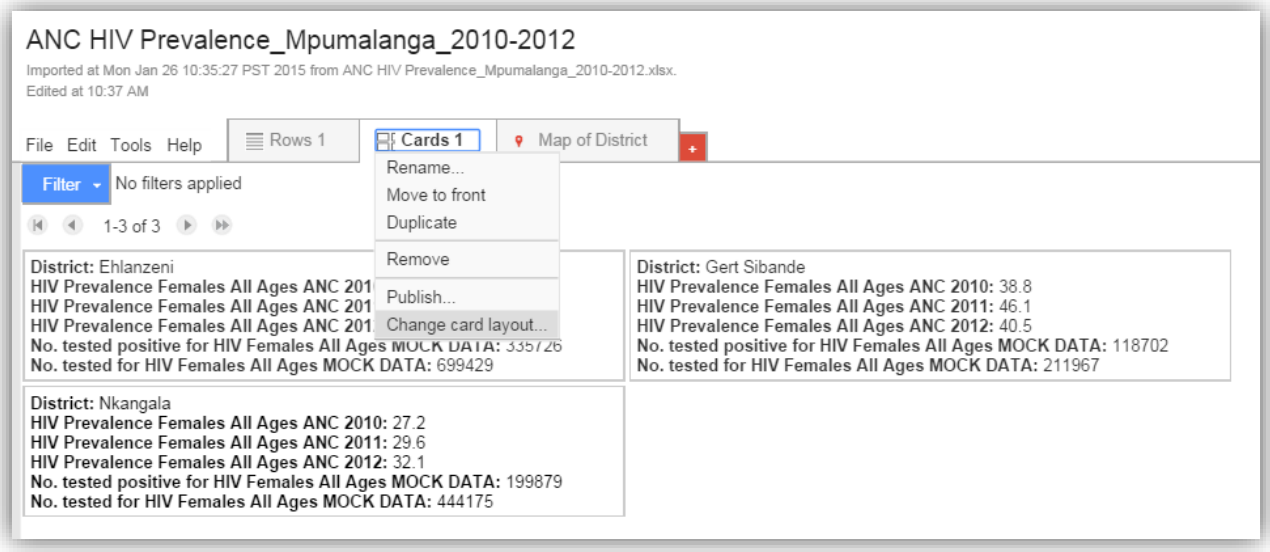
3.1. Cards

Video tutorial: https://www.youtube.com/watch?v=esUtNh0MFYM

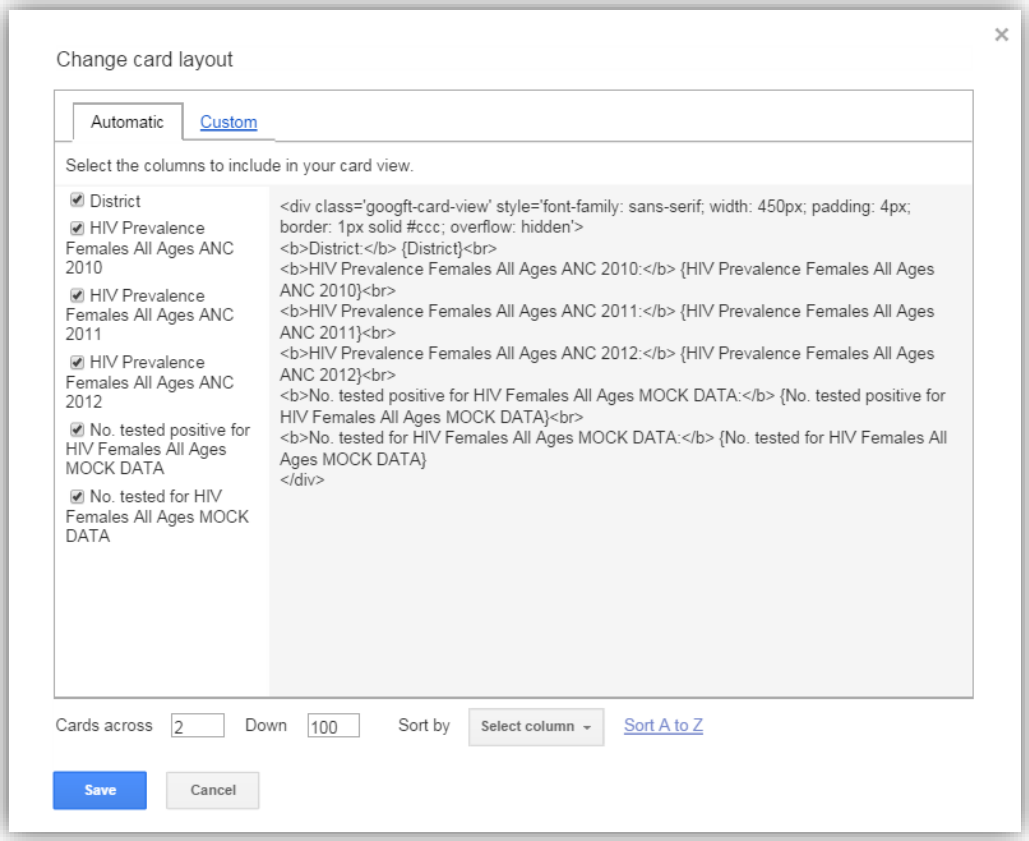
The Cards tab transforms the data in each row of your dataset into line-listed information on a single card. For example, each card shows the district name and related indicators for every row of your dataset. By default, Cards will appear as a tab at the top of your FusionTable.

To change the card layout:

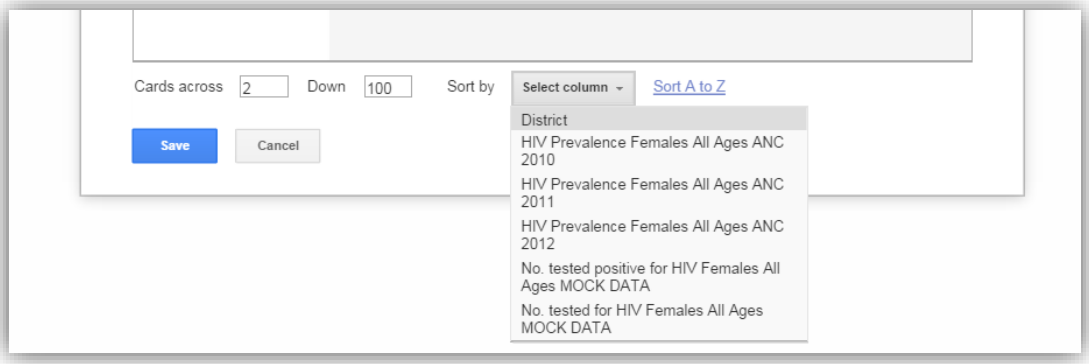
1. Click on the 'Cards' tab
2. Select 'Change card layout'



3. Check the boxes on the left next to each indicator you wish to include in your card



4. Select Sort by at the bottom of the window and choose the order the cards will be displayed. For example, if you select District, the cards will appear in alphabetical order by District name. If you select an indicator, the cards will appear from smallest to largest value for that indicator.
5. Click 'Save'



3.2. Charts

Video tutorial: https://www.youtube.com/watch?v=r0hws10Sr9c

The Chart function summarizes data into a chart format. Start by adding a Chart as a new tab in your FusionTable:

1. Select the red + button ( ) and choose 'Chart' from the drop down menu
2. A new tab 'Chart' containing Chart options will appear

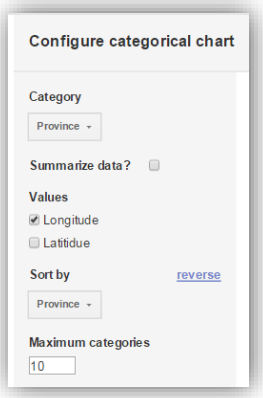
3. Select your preferred Chart Type from the left (e.g. bar chart)

3.2.1. Edit chart appearance

Edit the data and format of your chart using the Configure Categorical chart options on the left side widow:

Category: Change the indicator appearing on the x-axis (horizontal side) of the chart
Values: Check the box next to the indicator(s) you wish to display as values on your chart

Summarize Data: Check the box and select the summary option you wish to display by indicator (minimum values, maximum values, average, etc.)
Sort by: Change the order of elements on the x-axis (*e.g. A=> Z alphabetical, High to low, etc.*)
Maximum categories: Enter the number of categories on the x-axis



4. Edit the appearance of your chart by selecting the Change Appearance in the upper right

Title: Enter the Title of your chart
Legend: Change the location and appearance of your legend
Font/Background: Change the overall chart font and background

Features: Select the detailed appearance of your chart

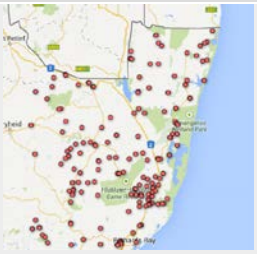
Axis: Select which axis you wish to edit (Horizontal or vertical); edit the title, labels and appearance for that axis

Columns: Select which columns on the chart you wish to edit and edit the color and y-axis location

3.3. Maps

Maps overlay data onto Google Maps. This guide will highlight how to display data on Polygon maps and Point maps. For detailed information about these types of maps see Table 1 below or visit https://support.google.com/fusiontables/answer/174680?hl=en.

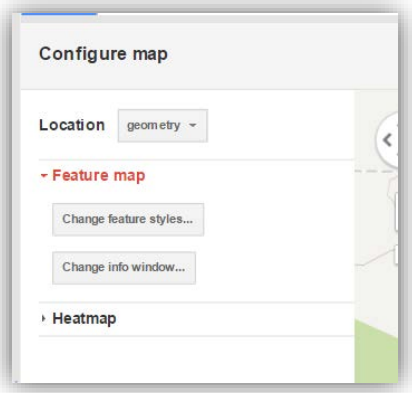
Table 1. Comparison of Polygon and Point maps.

	Polygon Map	Point Map
Definition	Displays shapes that represent areas such as provinces or districts	Displays x,y coordinates that represent specific features such as health facilities
Example outputs		
Program data inputs	Aggregate data (e.g., province or district totals)	Specific location data (e.g., data by facility)
Geographic data inputs	KML mapping file that is merged with program data. See section on *Merging datasets* for instruction.	Longitude and Latitude coordinate data (in decimal degrees) for each location in dataset.

3.3.1. Point maps

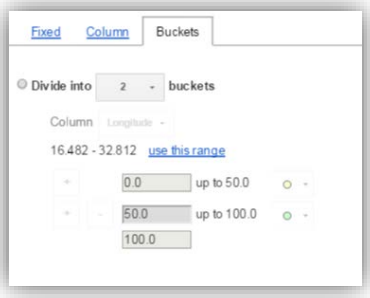
Video tutorial: https://www.youtube.com/watch?v=_5zbxoT0rwg

1. Select the 'Map' tab (look for this icon) that contains a Google map
2. Select Change Feature Style under Feature Map on the left side

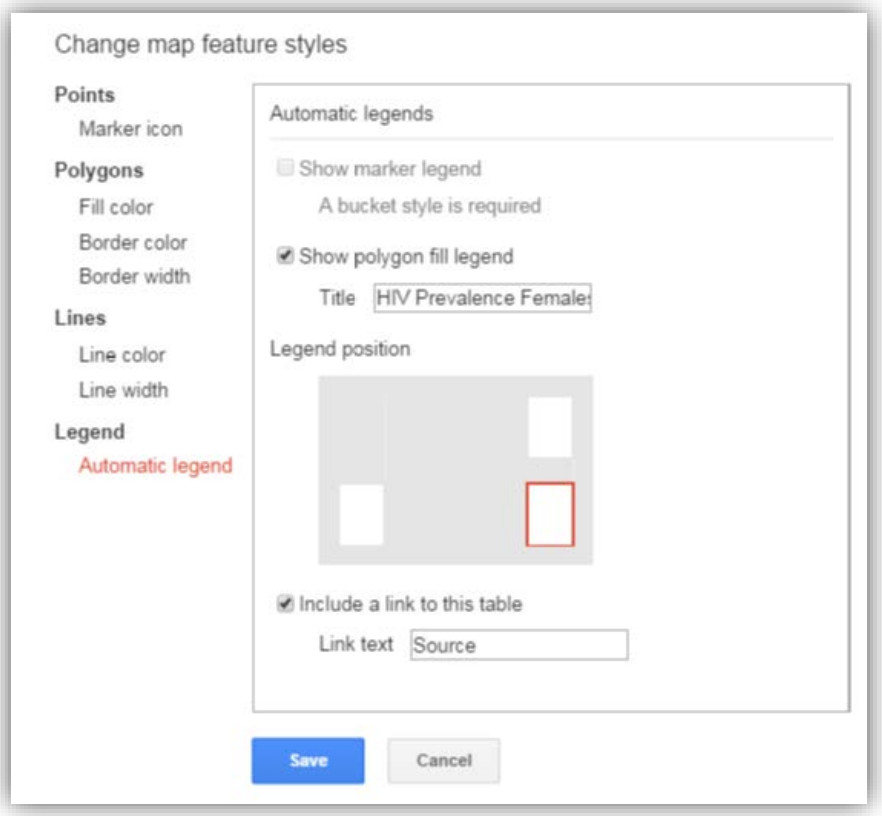


3. Under Points, select 'Marker' icon

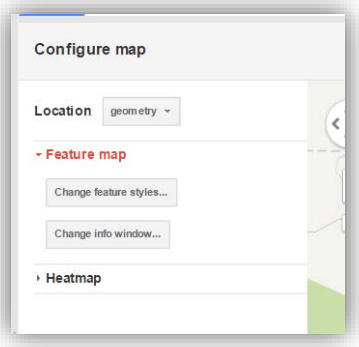
4. Select 'Buckets.' Buckets are the number of categories (or buckets) you wish your data to be divided into. Edit the following:
    a. **Divide into:** Adjust the number of categories (or buckets) you want your data to be divided into
    b. **Column:** Select the indicator to be displayed on the map
    c. **Use this range:** Resets the range of the data to match the indicator selected
    d. Click on a value to adjust the cutoff point
    e. Click on the color and choose from the wheel or shape to change the design of each bucket
    f. Select 'Save'



5. Under legend select 'Automatic Legend'
    a. Check the box next to Show marker legend
    b. Adjust the title for your legend if needed
    c. Select 'Save'



6. Select Change Info Window under Feature Map on the left side and follow the steps above under 'Cards' for instruction on how to change the info window contents



3.3.2. Polygon maps

Video tutorial: https://www.youtube.com/watch?v=WvYLaVbCWkI

In order to display data on a polygon map, you must first merge together:

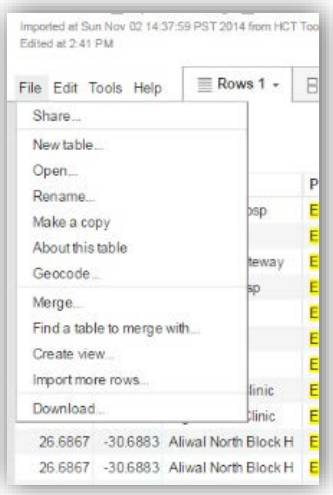
- Program data file (e.g. HIV prevalence data aggregated by district)
- KML mapping file (Keyhole Markup Language, a file format used to display geographic data on an earth browser such as Google Earth, Google Maps, etc.)

Both files to be merged must have a common indicator with identical contents. For example the indicator called District appears in both the program file dataset and the KML Mapping file s and contains the name of each District spelled exactly the same.

To merge these files:

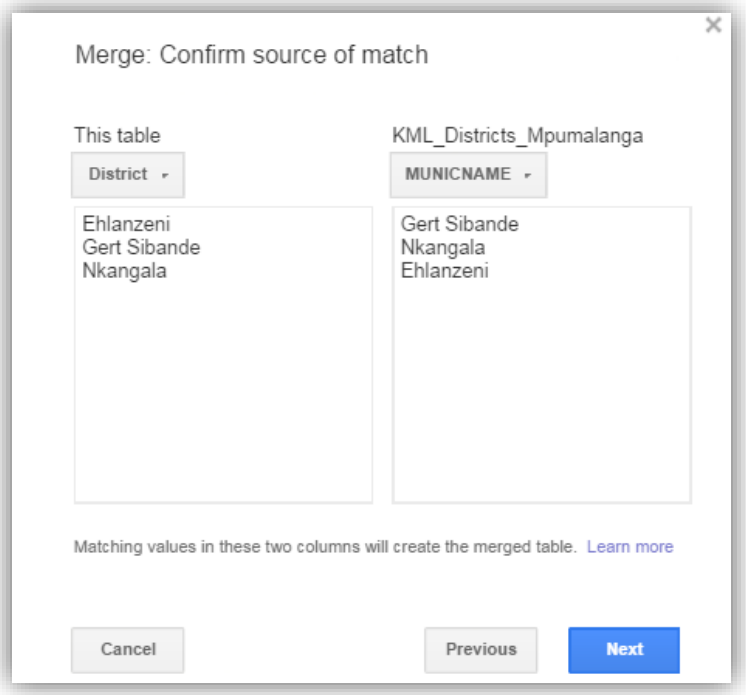
> **Tip**: All datasets and files to be merged must first be imported into FusionTables, including any KML mapping files. See *Importing data into Google FusionTables* for instruction.

7. From your Program data file, select 'File.'
8. Select 'Merge.'

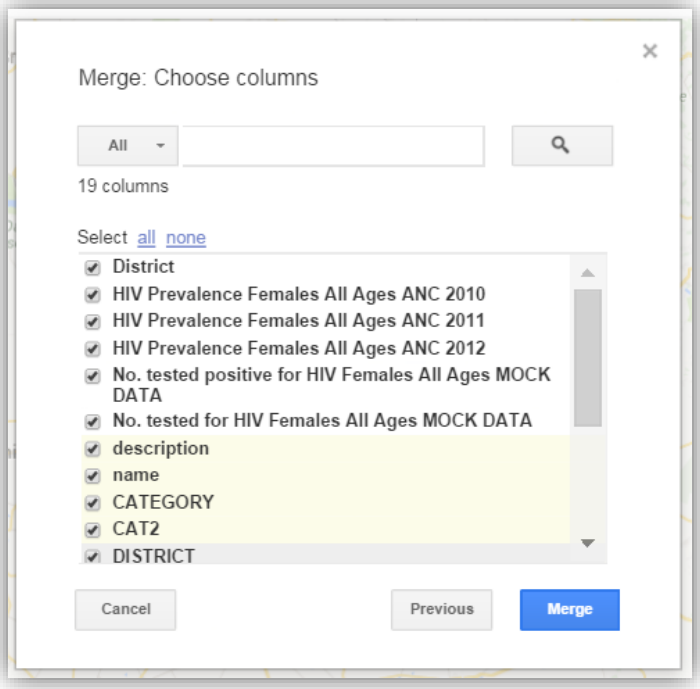


9. Select the FusionTable file you wish to merge
10. Select the indicator in each data file that matches (e.g. the indicator with identical District name data). Select 'Next.'

> **Tip**: The contents of the indicators to be merged must be identical. For example the district name in the data file must exactly match the district name in the KML mapping file. See *Editing a dataset* for instruction on how to change the names of your data files in Google FusionTables. If data is missing in your merged FusionTable (e.g., you only see '****') then the files did not merge properly and will need to be edited.



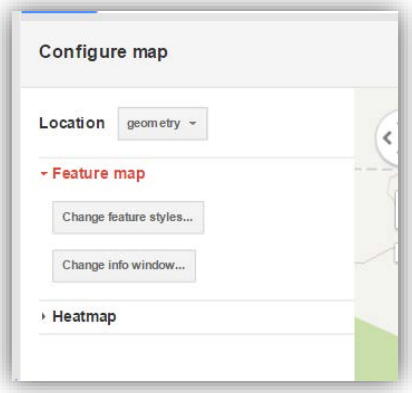
11. Select which indicators you wish to carry over to your next, merged FusionTable by checking or unchecking the boxes next to that indicator. Select 'Merge.'



Tip: If data is missing in your merged FusionTable (e.g., you only see '****') then the files did not merge properly and will need to be edited.

12. Select 'View Table' once the merged table has been created.

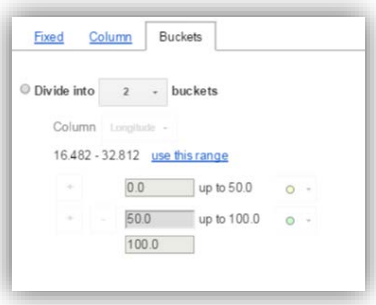
13. If the tab doesn't already appear, select the red + button ( ) and choose Map from the drop down menu
14. A new tab 'Map' will appear that contains a Google map
15. Select Change Feature Style under Feature Map on the left side



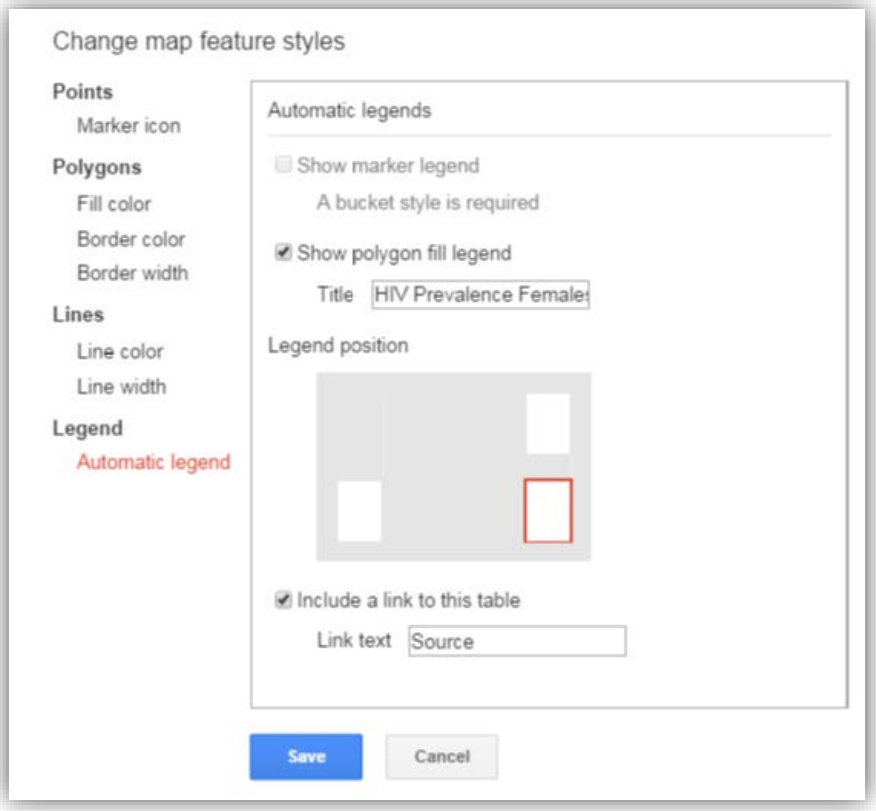
Tip: Select functions, including 'Add formula column,' will not work properly after merging unless you download and re-import the merged file. See *Downloading a dataset* for instruction.

16. Under Polygons, select 'Fill color'

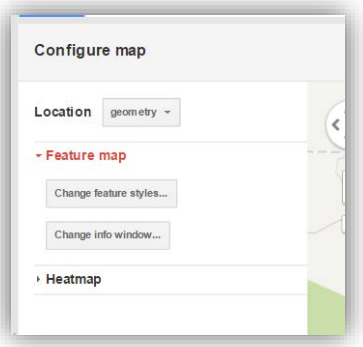
17. Select 'Buckets.' Buckets are the number of categories (or buckets) you wish your data to be divided into. Edit the following:
    - **g. Divide into:** Adjust the number of categories (or buckets) you want your data to be divided into
    - **h. Column:** Select the indicator to be displayed on the map
    - **i. Use this range:** Resets the range of the data to match the indicator selected
    - **j.** Click on a value to adjust the cutoff point
    - k. Click on the color and choose from the wheel or shape to change the design of each bucket
    - **l.** Select 'Save'



18. Under legend select ‘Automatic Legend’
    d. Check the box next to Show polygon fill legend
    e. Adjust the title for your legend if needed
    f. Select ‘Save’



19. Select Change Info Window under Feature Map on the left side and follow the steps above under ‘Cards’ for instruction on how to change the info window contents


Configure map
Location
geometry
Feature map
Change feature styles...
Change info window...
Heatmap

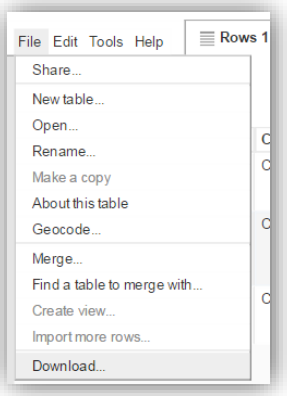
4. Additional components

4.1. Downloading a dataset

Video tutorial: https://www.youtube.com/watch?v=6ryJq7FoVQY

Formulas cannot be calculated in a merged dataset. Therefore, in order to take advantage of all FusionTable functions, a merged dataset must be downloaded onto your computer as a .csv file and then imported back into Google FusionTables. To download the file:

1. Select 'File' from the menu
2. Select Download



Tip: Files are downloaded to the location specified in your internet browser which is most commonly the *Downloads* folder on your computer. If your file does not appear in the Downloads folder, you can change the download location in Chrome as described here: https://support.google.com/chrome/answer/95574?hl=en

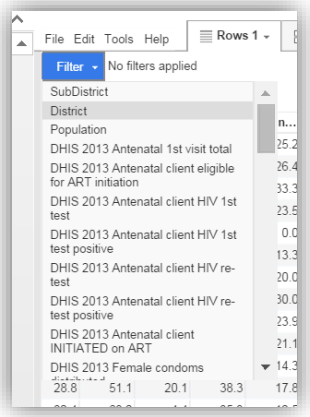
3. Accept the default settings and select 'Download.'
4. Your file is now saved as a .csv in the 'Downloads' folder on your computer.
5. Follow instruction in *Importing data into Google FusionTables* in order to import this .csv file into Google FusionTables for full functionality.

4.2. Filtering data

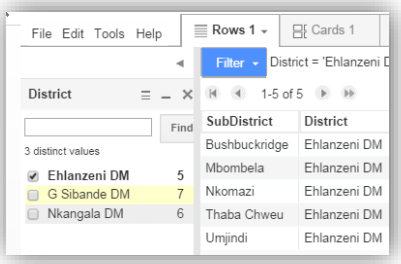
Video tutorial: *https://www.youtube.com/watch?v=Yceg8-N1nNc*

Google FusionTables allow for certain elements to be included and others to be excluded using the filter function. Elements can be filtered from all tabs (i.e. Dataset, Cards, Charts, and Maps).

1. Click the blue 'Filter' button.
2. Select the category you wish to filter



3. Check the boxes next to the fields you wish to include (e.g. certain provinces or districts)

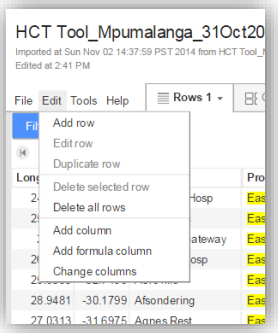


4.3. Editing data

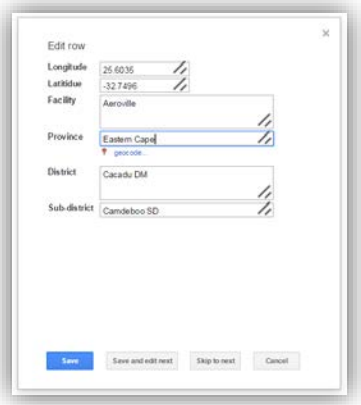
Video tutorial: https://www.youtube.com/watch?v=5BE8_KShWFo

Select the Tab titled Rows 1 to edit the data in your Google FusionTable.

1. Select the Edit menu to add, delete or change entire rows or columns.



2. Double click within a cell to change the contents of cells within a row.



3. Select 'Save.'

4.4. Sharing Google FusionTables

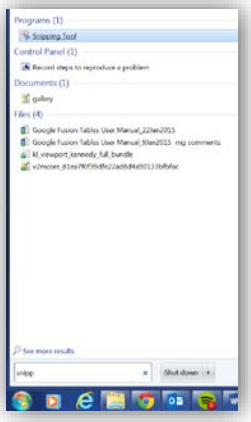
Video tutorial: https://www.youtube.com/watch?v=95U7zZfQ-3g

Outputs can be shared as either static images by taking a screen shot of your final figure or as a digital link through Google that allows users to view and/or edit content.

4.4.1. Sharing a static image

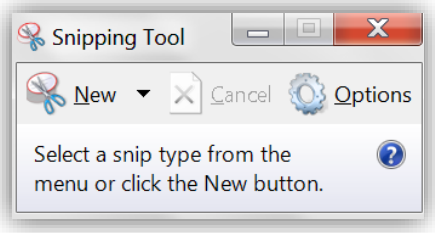
Use the Snipping Tool to capture your desired image

1. From your Start menu, type 'Snipping Tool' and select from the list

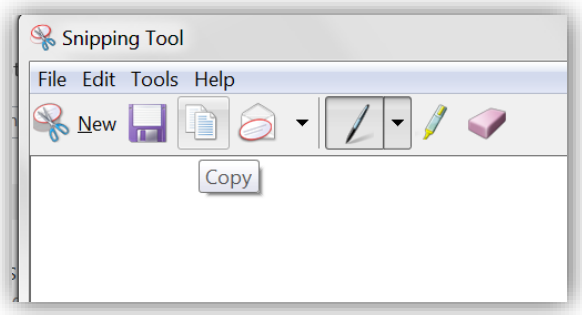


Tip: For further instruction visit: http://windows.microsoft.com/en-us/windows7/products/features/snipping-tool

2. Select 'New'



3. Use your mouse cursor to draw a rectangle around the area you want to make into an image
4. Select the 'Copy' icon



5. Paste the image into any Microsoft Office (e.g. Powerpoint) application

4.4.2. Sharing a digital FusionTable

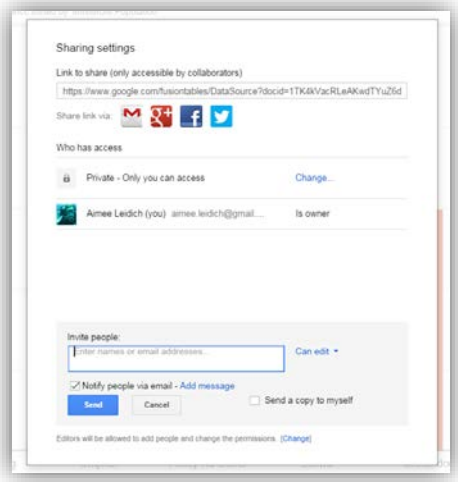
Share a website link containing your FusionTable either by inviting people to view or edit or by sending a URL.

1. 1. Select share 

in the upper Right corner

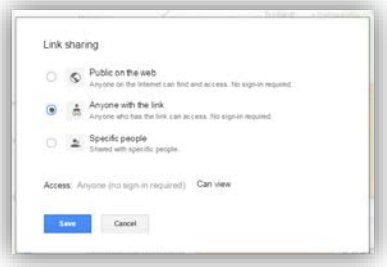
Sharing a link for people to view:

2. Copy the Link to share
3. Paste this link in an email or document to provide access
4. Select 'Change' under who has access



Tip: A link can be viewed by anyone with the link even if they do not have a Google or Gmail account. However, only those with a Google or Gmail account are able to edit a FusionTable

5. Choose 'Anyone with the Link' to allow others with the link to *view* your file. Viewers will not be able to edit or make changes.



Inviting people to edit:

6. Type the Gmail addresses of the people you want to share with under “Invite People”
7. Click the dropdown arrow on the right to designate the type of access:
   - **Can edit**: Allows users to edit and share with others
   - **Can view**: Allows users to view but not make any changes
8. Click **Send**. Invitees will receive an email letting them know you’ve shared the file or folder with them.