

## Using Tableau to map discarded syringe data

So far we've used Google's Fusion Tables to create heat maps and plot specific locations on a map. Of course, Fusion Tables can also display these data as tables, hence its name.

However, we will introduce you to another way of visualizing that can be used in conjunction with those maps that you've created, [Tableau](#).

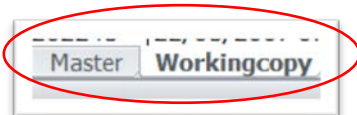
This free, online visualization tool allows you to build interactive graphics that can display a lot of information simultaneously.

To see what we're talking about, please click here for examples using [Tableau](#).

For this tutorial, we will continue using the discarded syringe data, as using a second visualization tool emphasizes how the information can be displayed differently from Fusion Tables.

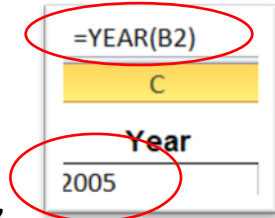
So let's get started.

- 1) Download the same [discarded syringe dataset](#) that we used for the Fusion Table tutorial.
- 2) Copy the table on the "Master" worksheet, paste it into a new worksheet, label it "WorkingCopy" and drag the tab to the right of the Master



3)

4) Since we'll performing calculations by year [`=Year(cell reference)`] and be sure to format the number as "General", create a new column to the right of the "Date" column (B), and



call it "Year".

Date	Year	Time	Street Address	
08/10/2005 0:00	2005	8:14:47 AM	WOODROFFE	Ottawa

Format Cells

Number Alignment Font Border Fill Protection

Category:

- General
- Number
- Currency
- Accounting
- Date
- Time
- Percentage
- Fraction
- Scientific
- Text
- Special
- Custom

Sample: 2005

General format cells have no specific number format.

OK Cancel

B	C	D
Date	Year	Time
08/10/2005 0:00	2005	8:14:47 AM
07/11/2007 0:00	2007	11:20:18 AM
02/05/2006 0:00	2006	11:33:53 AM
02/05/2006 0:00	2006	11:48:22 AM
02/05/2006 0:00	2006	2:27:49 PM
02/11/2007 0:00	2007	9:17:51 AM
23/04/2007 0:00	2007	11:13:31 AM
29/07/2007 0:00	2007	7:01:24 PM
11/12/2006 0:00	2006	7:48:53 AM
03/04/2006 0:00	2006	7:17:09 PM
23/03/2006 0:00	2006	9:24:34 AM
20/06/2006 0:00	2006	10:35:01 AM
29/07/2006 0:00	2006	9:53:36 AM
03/09/2006 0:00	2006	11:13:29 AM
30/08/2007 0:00	2007	3:46:49 PM
13/10/2005 0:00	2005	5:15:11 PM
19/04/2005 0:00	2005	1:46:26 PM
20/02/2006 0:00	2006	6:10:30 PM

- 5) Create a pivot table in which you count the number of records in the table using the ID number (SR#) in column A, place the “Year” column in the pivot table’s “Year” section, and place the “Ward” column in the “Row Label” section. As you will do with each new worksheet, be sure to drag the tab to the right of the preceding

one.

The screenshot shows a Tableau worksheet with a pivot table and the field shelf on the right. The pivot table has 'Row Labels' and 'Column Labels'. The field shelf shows 'Year' in the Columns area and 'Ward' and 'Count of SR #' in the Values area. Red circles highlight the 'Year' dropdown in the Columns area and the 'Ward' and 'Count...' dropdowns in the Values area.

Row Labels	2012	2013	Grand Total
WARD 12	84	36	120
WARD 14	32	17	49
WARD 16	17	9	26
WARD 15	5	9	14
WARD 13	5	5	10
WARD 1	6	2	8
WARD 11	2	6	8
WARD 17	3	4	7
WARD 10	3	2	5
WARD 7		4	4
WARD 8	3	1	4
WARD 18	3	1	4
WARD 19	2	1	3
WARD 21	2		2
WARD 9	2		2
WARD 23	1	1	2
WARD 4	2		2
WARD 22		1	1
WARD 2		1	1
<b>Grand Total</b>	<b>172</b>	<b>100</b>	<b>272</b>

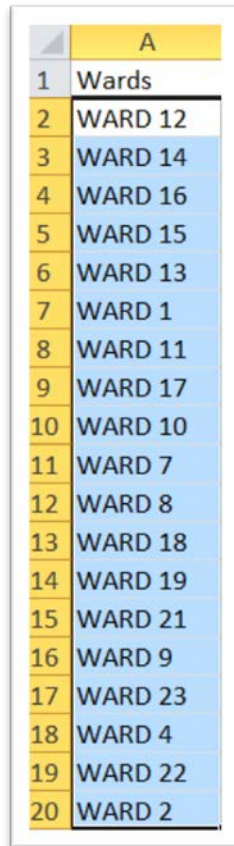
- 6) Copy the pivot table, and use the “Paste Special – Value” option to put it into a new worksheet, where you will delete the extraneous rows at the top ( the usual clean-up ), and replace the “Row Labels” name in column A with something that will make more sense to the reader who will eventually see this table in Tableau.
- 7) Call column A “Wards”, be sure to re-position the tab so that everything is reading left to right, rename the tab

“SyringePerWardTable”.

	A	B	C	D	E	F
1	Wards	2012	2013	Grand Total		
2	WARD 12	84	36	120		
3	WARD 14	32	17	49		
4	WARD 16	17	9	26		
5	WARD 15	5	9	14		
6	WARD 13	5	5	10		
7	WARD 1	6	2	8		
8	WARD 11	2	6	8		
9	WARD 17	3	4	7		
10	WARD 10	3	2	5		
11	WARD 7		4	4		
12	WARD 8	3	1	4		
13	WARD 18	3	1	4		
14	WARD 19	2	1	3		
15	WARD 21	2		2		
16	WARD 9	2		2		
17	WARD 23	1	1	2		
18	WARD 4	2		2		
19	WARD 22		1	1		
20	WARD 2		1	1		
21	Grand Total	172	100	272		
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						

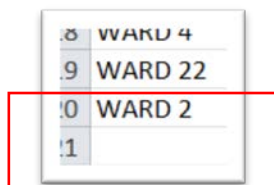
- 8) This table is not ready to upload to Tableau, which needs every row to contain the same values.
- 9) Copy this table and paste it into a new worksheet, we'll call “SyringePerWardTableforTableau”.

- 10) We'll have to use the same steps we took in steps 23-38 in the second [Ottawa Crime Data Tutorial](#).
- 11) First, we'll need to delete a row and column we don't need: the "Grand Total" -- row (21) -- and the "Grand Total" -- column (D).
- 12) Select the cells in the Wards column (A) (NOTE: do not select the title because we won't need it.)



	A
1	Wards
2	WARD 12
3	WARD 14
4	WARD 16
5	WARD 15
6	WARD 13
7	WARD 1
8	WARD 11
9	WARD 17
10	WARD 10
11	WARD 7
12	WARD 8
13	WARD 18
14	WARD 19
15	WARD 21
16	WARD 9
17	WARD 23
18	WARD 4
19	WARD 22
20	WARD 2

- 13)
- 14) Copy this selection, put your cursor on cell A21 .....



8	WARD 4
9	WARD 22
10	WARD 2
11	

- 15)
- 16) .... paste the selection.

20	WARD 2
21	WARD 12
22	WARD 14
23	WARD 16
24	WARD 15
25	WARD 13
26	WARD 1
27	WARD 11
28	WARD 17
29	WARD 10
30	WARD 7
31	WARD 8
32	WARD 18
33	WARD 19
34	WARD 21
35	WARD 9
36	WARD 23
37	WARD 4
38	WARD 22
39	WARD 2
40	

17)

18) Highlight row 21 in yellow, so you'll know where the new table begins. (NOTE: please review 63-64 in Computer-Assisted Reporting, to learn about the importance of using colours)

20	WARD 2
21	WARD 12
22	WARD 14

19)

20) Select the values in the "2013" column (C).

21) Put your cursor on cell B21, and paste the selection.



WARD 12	36
WARD 14	17
WARD 16	9
WARD 15	9
WARD 13	5
WARD 1	2
WARD 11	6
WARD 17	4
WARD 10	2
WARD 7	4
WARD 8	1
WARD 18	1
WARD 19	1

22)

23) Rename column B "Syringe\_Number" and column C, which now has no values because they've been pasted below, "Year".

1	Wards	Syringe Number	Year
---	-------	----------------	------

24)

25) In C1, type the year 2012 and copy it down to the yellow mark at row 21.

	A	B	C
1	Wards	Syringe Number	Year
2	WARD 12	84	2012
3	WARD 14	32	2012
4	WARD 16	17	2012
5	WARD 15	5	2012
6	WARD 13	5	2012
7	WARD 1	6	2012
8	WARD 11	2	2012
9	WARD 17	3	2012
10	WARD 10	3	2012
11	WARD 7		2012
12	WARD 8	3	2012
13	WARD 18	3	2012
14	WARD 19	2	2012
15	WARD 21	2	2012
16	WARD 9	2	2012
17	WARD 23	1	2012
18	WARD 4	2	2012
19	WARD 22		2012
20	WARD 2		2012
21	WARD 12		

26)

27) In cell C21 type 2013, the year that corresponds to the next set of wards, and copy it to the bottom.

28)

1	WARD 12	36	2013
2	WARD 14	17	2013
3	WARD 16	9	2013
4	WARD 15	9	2013
5	WARD 13	5	2013
6	WARD 1	2	2013
7	WARD 11	6	2013
8	WARD 17	4	2013
9	WARD 10	2	2013
10	WARD 7	4	2013
11	WARD 8	1	2013
12	WARD 18	1	2013
13	WARD 19	1	2013
14	WARD 21		2013
15	WARD 9		2013
16	WARD 23	1	2013
17	WARD 4		2013
18	WARD 22	1	2013
19	WARD 2	1	2013

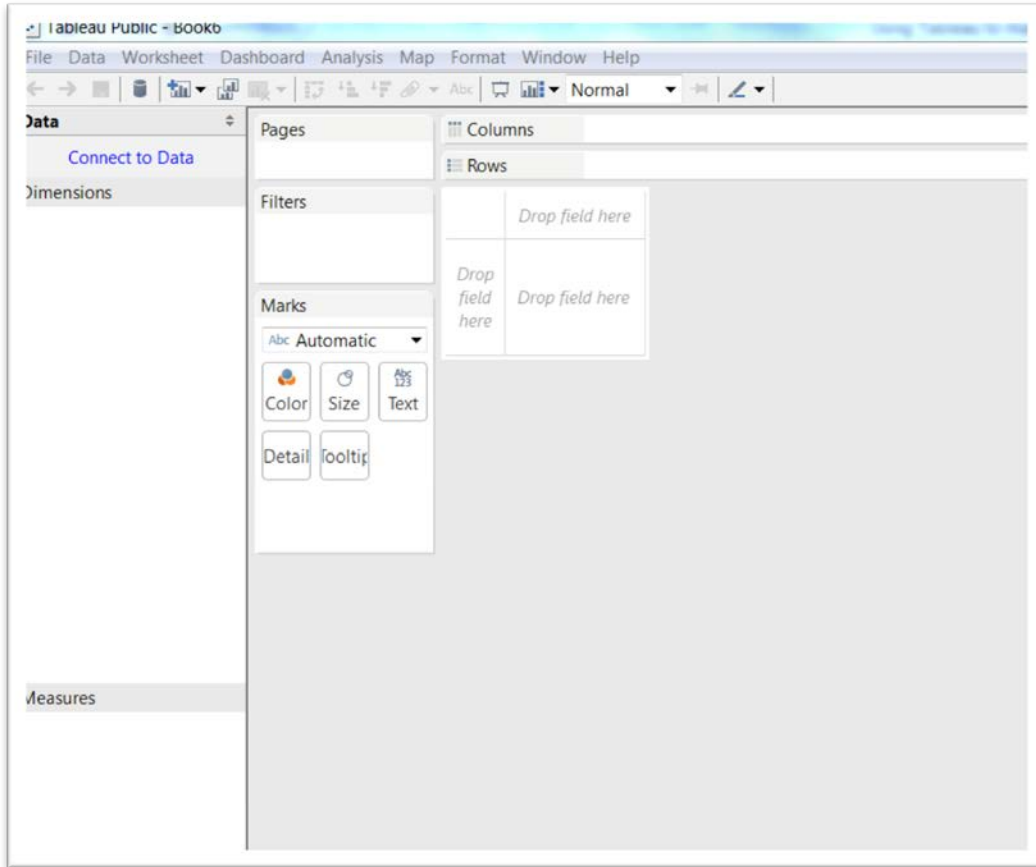
29)

30) You can either leave the colour or get rid of it.

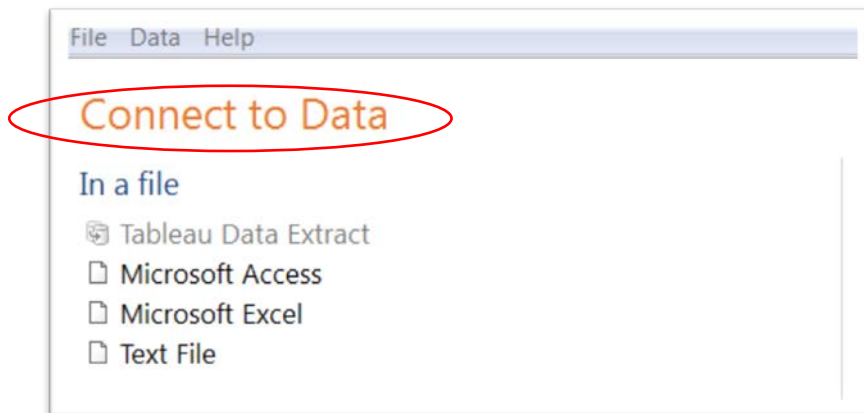
31) Unlike Fusion Tables, Tableau can handle Excel workbooks with multiple worksheets. So there's no need to copy this table and paste it into a new workbook, as we did with Fusion Tables. By labeling the worksheet we'll be using for Tableau the way we did, it will be clear which one we will want to visualize.

32) If you haven't done so already, download Tableau, the [public version](#). (NOTE: Up until recently, it was only available for PC-compatible computers. There is a new Mac version, but according to much of the conversation on the [NICAR listserv](#), there are certain limitations. For instance, with the plug-in that Tableau uses to [transpose data](#) in order to properly group the information for different visualizations. So you'll have to make sure that you do as much as the heavy lifting as possible in Excel before uploading the data.)

33) Open Tableau.

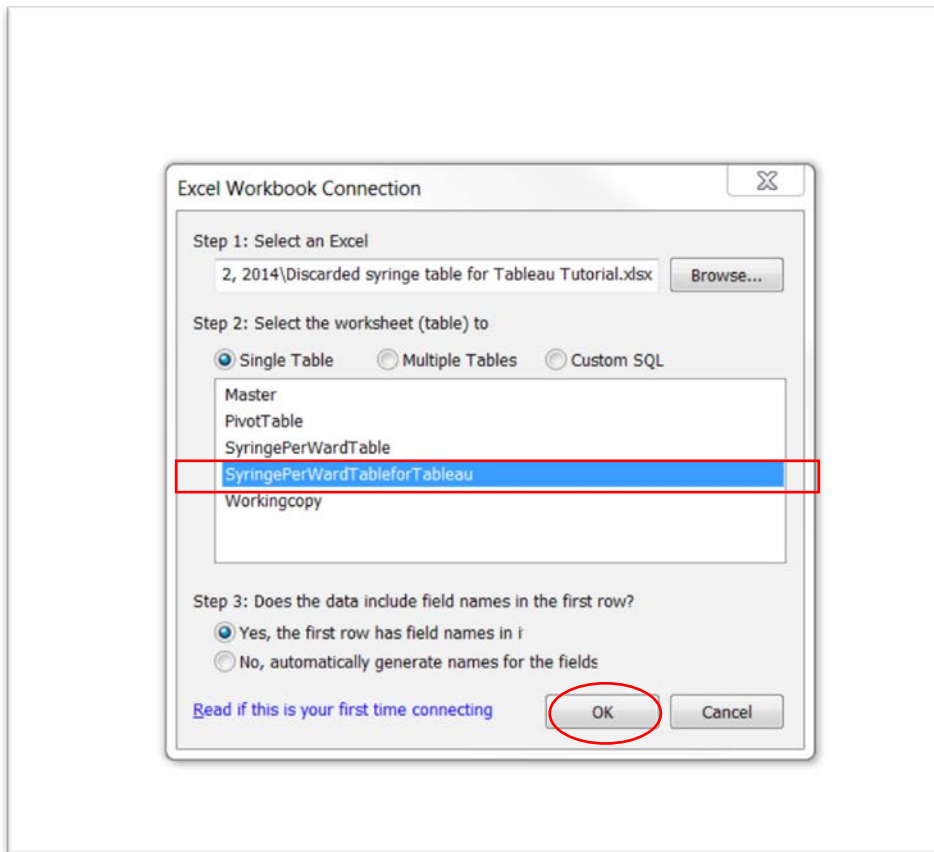


34) Select the "Connect to Data" tab.

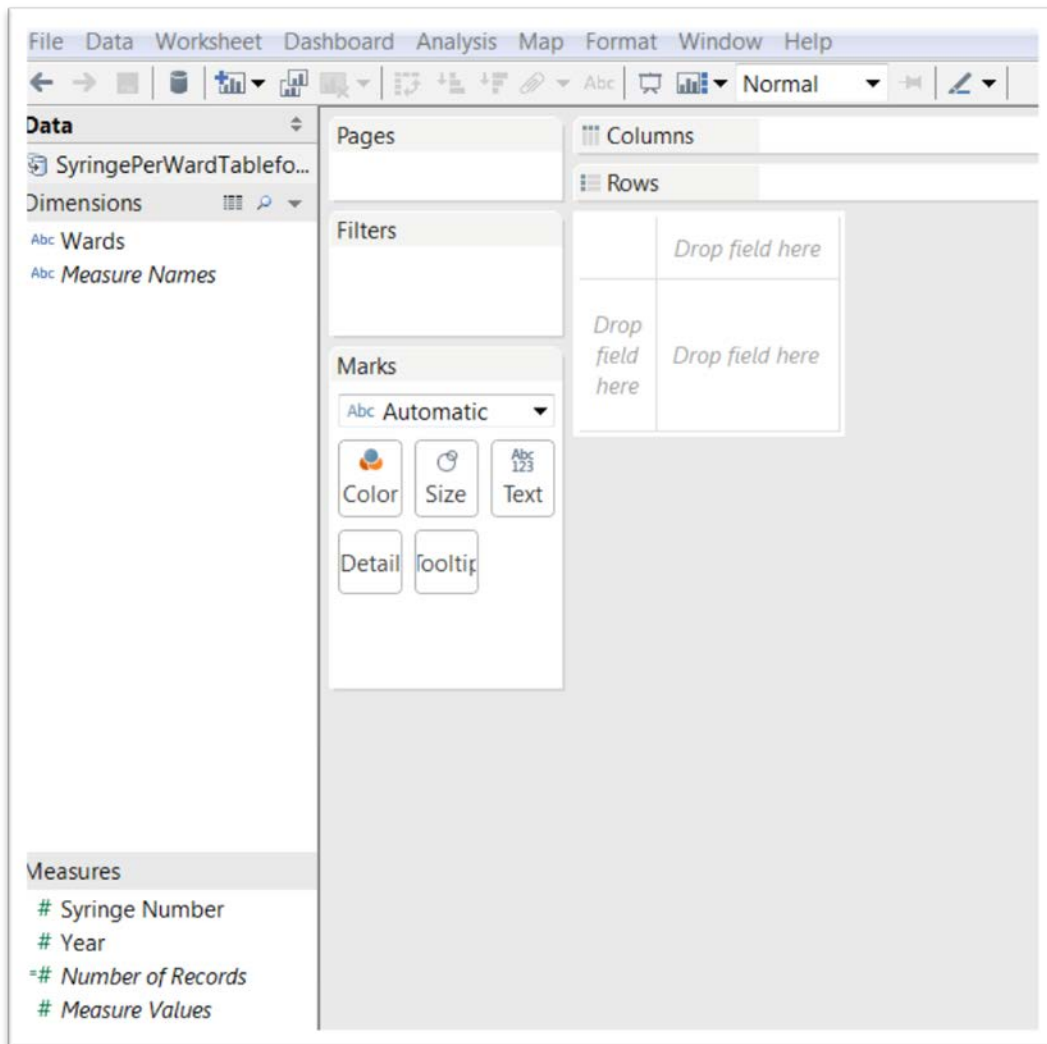


35) Select Microsoft Excel, and browse your hard drive for the Excel workbook.

- 36) Select the file, and be sure to highlight the proper worksheet, made easier because of the way we named it.



37) Pull the table into Tableau.



38) You'll notice that the interface resembles Excel's pivot table ( a key reason we've placed so much emphasis on learning pivot tables ). The "Measures" section is for columns with values" on which we will do math. Because it contains numbers, Tableau assumes we want to perform math on the values in the "Year" column. Not so. As in a pivot table, we only want to GROUP by year. So drag the "Year" tab into the Dimensions section, which is for text. (NOTE: If our table contained geographic coordinates such as country names, there would also be a globe icon in the

Dimensions section, allowing us to display those points on a map, which would then become part of the visualization package.)

- 39) As we would do in a pivot table, place the “Syringe Number” column in the table box for values, the bottom right. Or you can also place it in the “Text” icon under the “Marks section, which deals with dimensions and measures.

Pages

Columns

Rows

Filters

Marks

Abc Automatic

Color Size Text

Detail Tooltip

Drop field here

Drop field here

Drop field here

This screenshot shows the Tableau interface. The Marks card is set to 'Text'. The 'Text' button is circled in red. The main view area contains a table with three placeholder cells, each labeled 'Drop field here'. One of these cells is also circled in red.

Pages

Columns

Rows

Filters

Marks

Abc Automatic

Color Size Text

Detail Tooltip

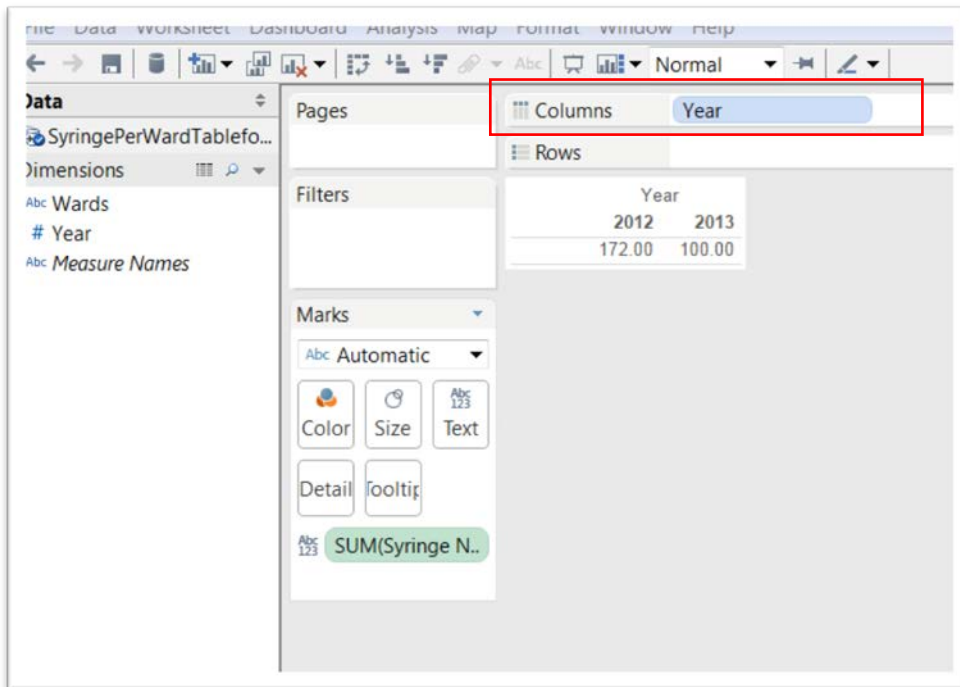
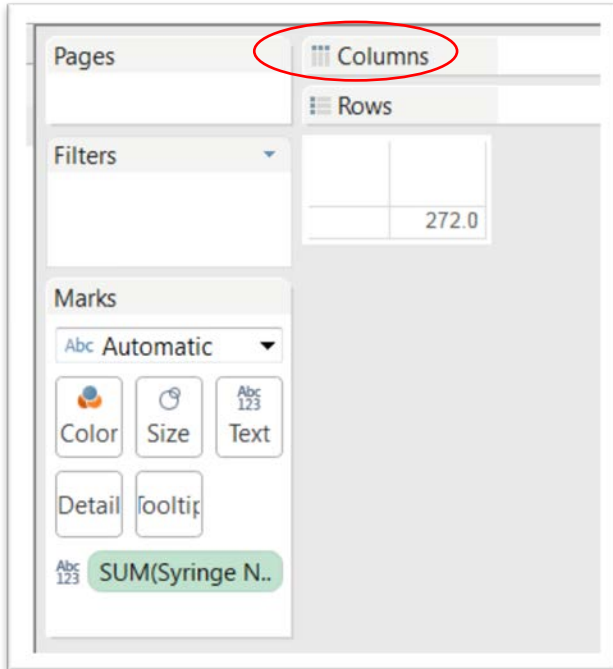
Abc 123 SUM(Syringe N..)

272.0

This screenshot shows the same Tableau interface. The Marks card is still set to 'Text'. The calculated field 'SUM(Syringe N..)' is now visible in the Marks card and is circled in red. The main view area contains a table with one cell containing the value '272.0', which is also circled in red.

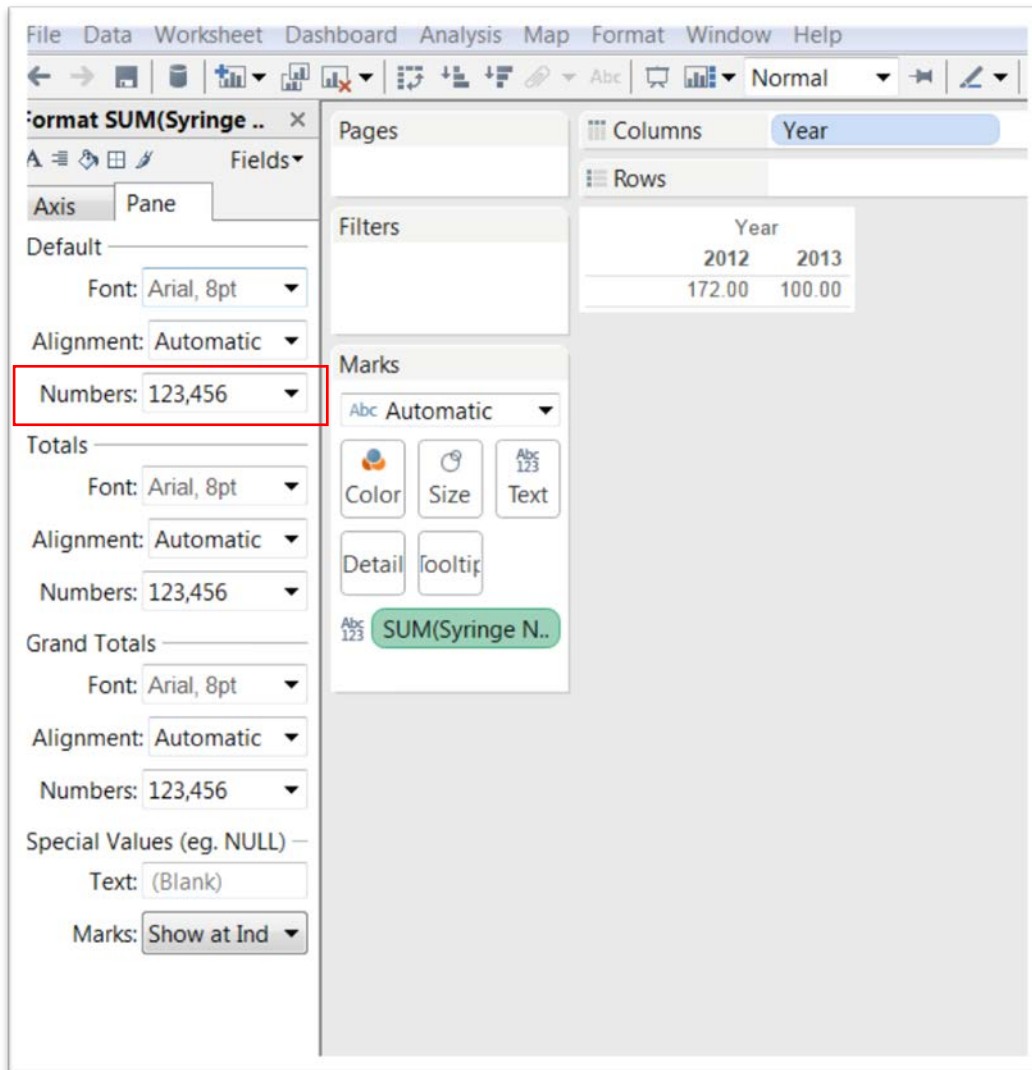


40) Place the “Year” column into the “Column” section.



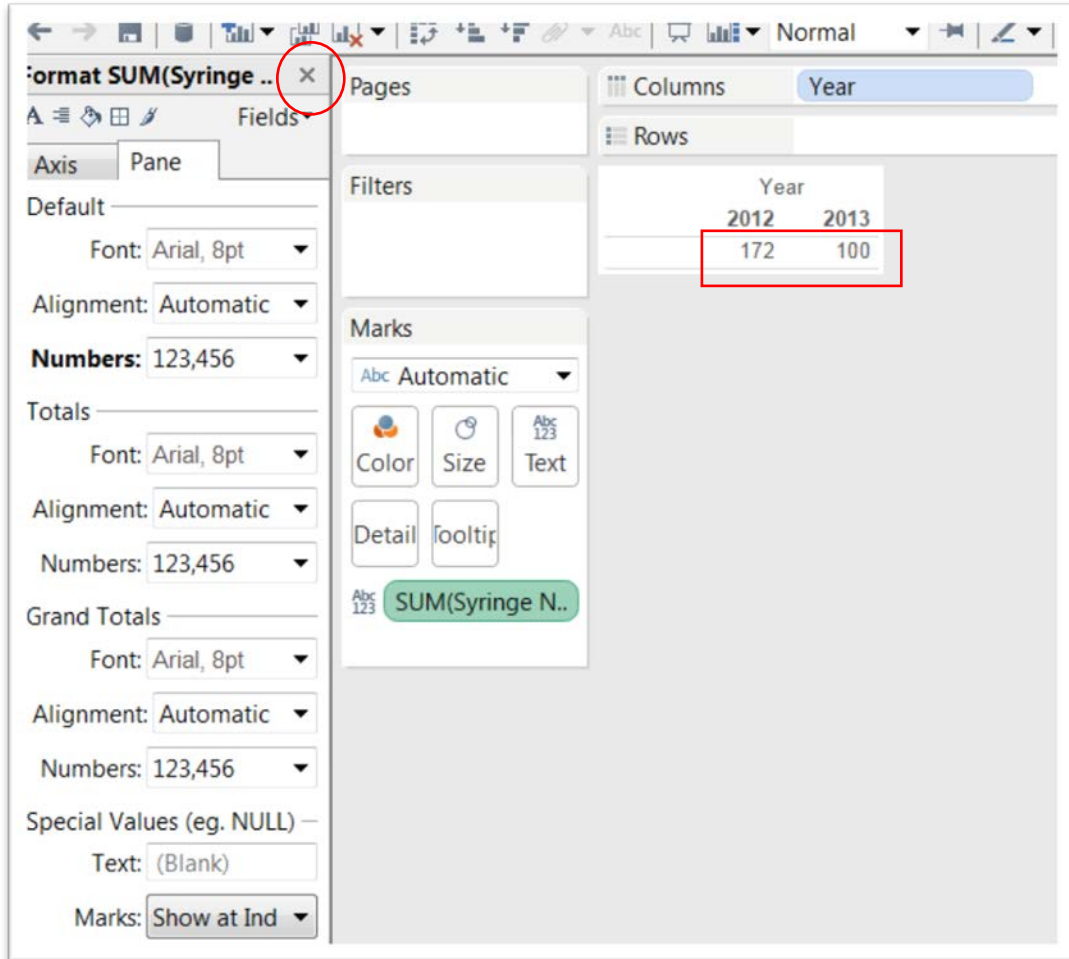
41) Let's use Tableau's Formatting function to delete the decimal places.

- 42) Place your cursor over the “SUM(Syringe N...) tab to obtain a downward arrow.
- 43) Click on the arrow to get your shortcut menu, and choose format. A menu will appear in the pane to the left.



- 44) In the “Default” section, select the downward arrow to the right of “Numbers”.

45) Choose “Number (Standard)”.



46) Close the formatting dialogue box by clicking the “X”.

47) Drag the “Wards” column into the “Rows” section.

The screenshot shows the Tableau Desktop interface with a pivot table. The 'Columns' shelf contains 'Year' and the 'Rows' shelf contains 'Wards'. The pivot table displays the following data:

Wards	Year	
	2012	2013
WARD 1	6	2
WARD 2		1
WARD 4	2	
WARD 7		4
WARD 8	3	1
WARD 9	2	
WARD 10	3	2
WARD 11	2	6
WARD 12	84	36
WARD 13	5	5
WARD 14	32	17
WARD 15	5	9
WARD 16	17	9
WARD 17	3	4
WARD 18	3	1
WARD 19	2	1
WARD 21	2	
WARD 22		1
WARD 23	1	1

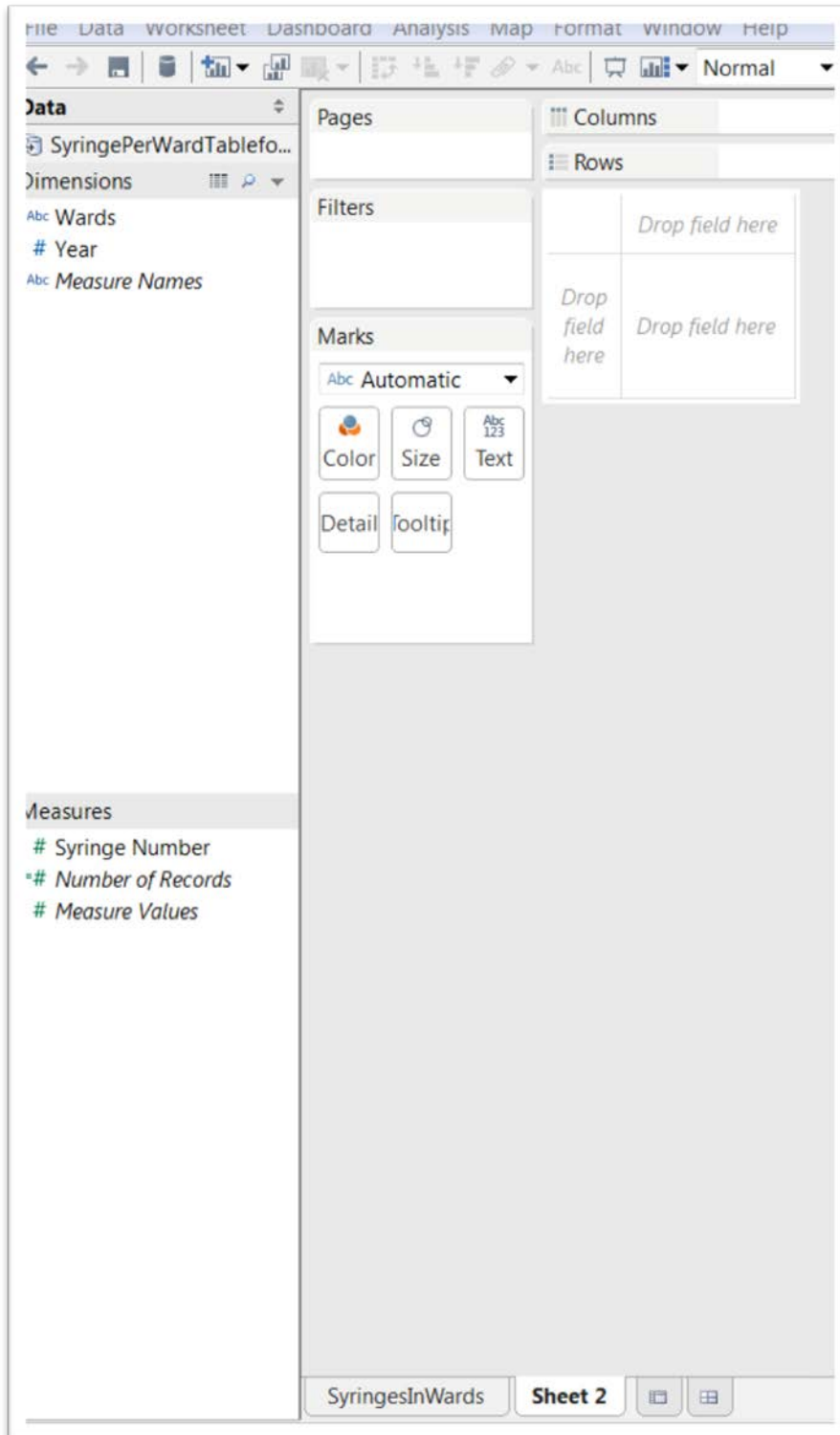
48) You can sort the values in 2013 in descending order by clicking on “2013”.

The screenshot shows the Tableau interface with a pivot table. The table has 'Wards' as the row dimension and 'Year' as the column dimension. The measure is 'SUM(Syringe N..)'. The 2013 column header is circled in red.

Wards	Year	
	2012	2013
WARD 12	84	36
WARD 14	32	17
WARD 15	5	9
WARD 16	17	9
WARD 11	2	6
WARD 13	5	5
WARD 17	3	4
WARD 7		4
WARD 1	6	2
WARD 10	3	2
WARD 18	3	1
WARD 19	2	1
WARD 2		1
WARD 22		1
WARD 23	1	1
WARD 8	3	1
WARD 21	2	
WARD 4	2	
WARD 9	2	

49) If this looks like a pivot table, that’s because essentially it is. This worksheet is good to go. Name it “SyringesInWards”.

50) Open a new worksheet.



51) In this one, we will calculate the difference in the number of syringes in each ward from 2012 to 2013. So we'll need to create

the same table as we did in the “SyringesInWards” worksheet.

The screenshot shows the Tableau Desktop interface with a pivot table. The table displays the sum of syringe counts for various wards across the years 2012 and 2013. The 'SUM(Syringe N..)' field is highlighted in the Marks card. The 'Sheet 2' tab is circled in red at the bottom.

Wards	2012	2013
WARD 12	84	36
WARD 14	32	17
WARD 15	5	9
WARD 16	17	9
WARD 11	2	6
WARD 13	5	5
WARD 17	3	4
WARD 7		4
WARD 1	6	2
WARD 10	3	2
WARD 18	3	1
WARD 19	2	1
WARD 2		1
WARD 22		1
WARD 23	1	1
WARD 8	3	1
WARD 21	2	
WARD 4	2	
WARD 9	2	

52) Let's get the drop-down menu from the "SUM(Syringe N...)" tab as we did in steps 43 to 45.

53) But instead of choosing "Format" right away, let's select "Quick Table Calculation", and then "Percent Difference".

The screenshot shows the Tableau Desktop interface. On the left, the 'Format % Difference i..' dialog box is open, with the 'Numbers' field set to '123,456' and circled in red. The dialog also shows 'Font: Arial, 8pt', 'Alignment: Automatic', and 'Special Values (eg. NULL) - Text: (Blank)'. In the center, the 'Marks' card is set to 'Automatic'. On the right, a data table is displayed with columns 'Wards' and 'Year' (2012, 2013). The table contains numerical values and some placeholder text (#####).

Wards	Year	
	2012	2013
WARD 12		#####
WARD 14	-0.46875	
WARD 15		0.8
WARD 16		#####
WARD 11		2
WARD 13		0
WARD 17		#####
WARD 7		
WARD 1		#####
WARD 10		#####
WARD 18		#####
WARD 19		-0.5
WARD 2		
WARD 22		
WARD 23		0
WARD 8		#####
WARD 21		-1
WARD 4		-1
WARD 9		-1

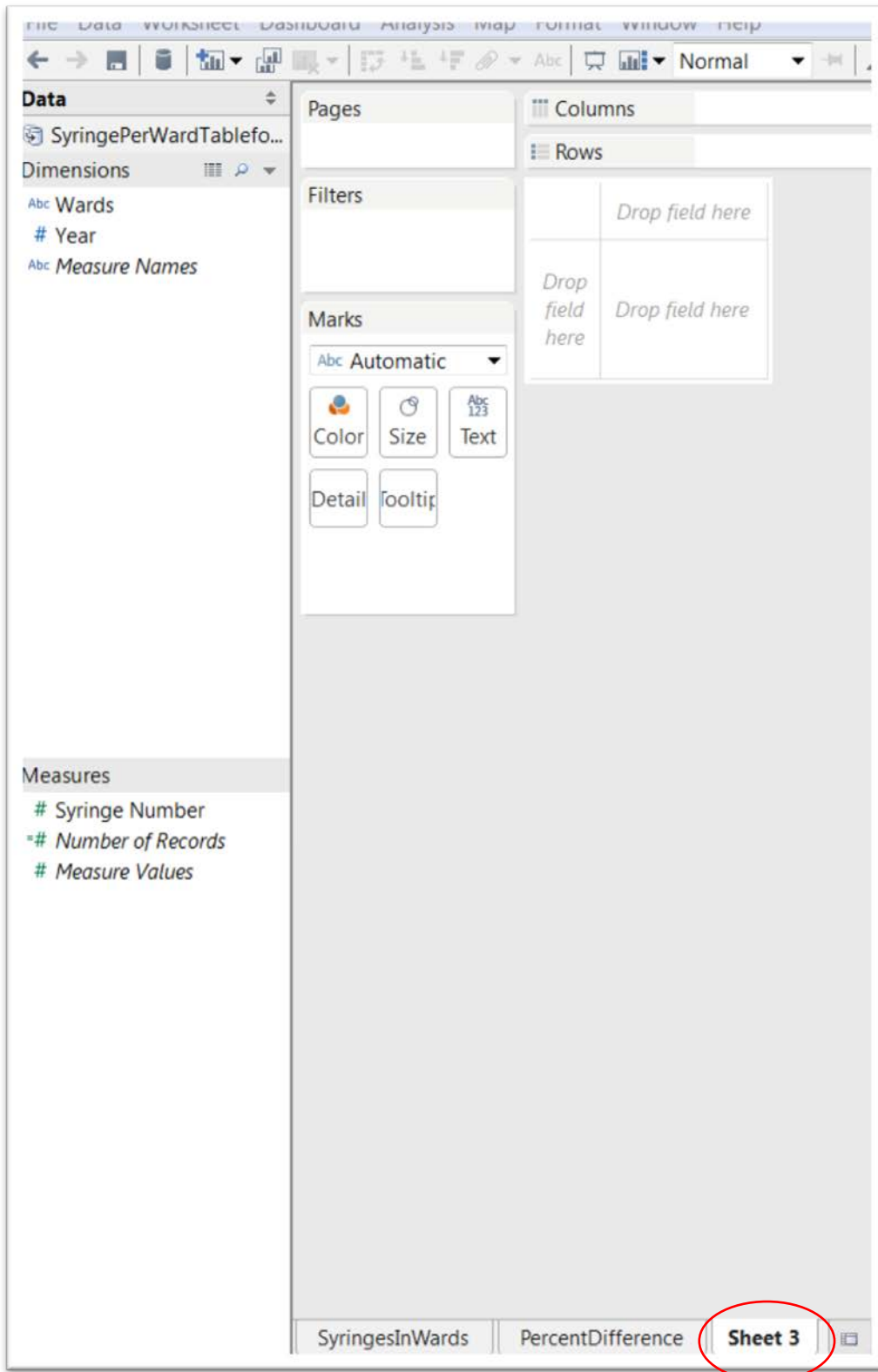


- 54) Reformat the numbers, using the steps in 43-45, and select “Percentage” with one decimal place from the dialogue box.

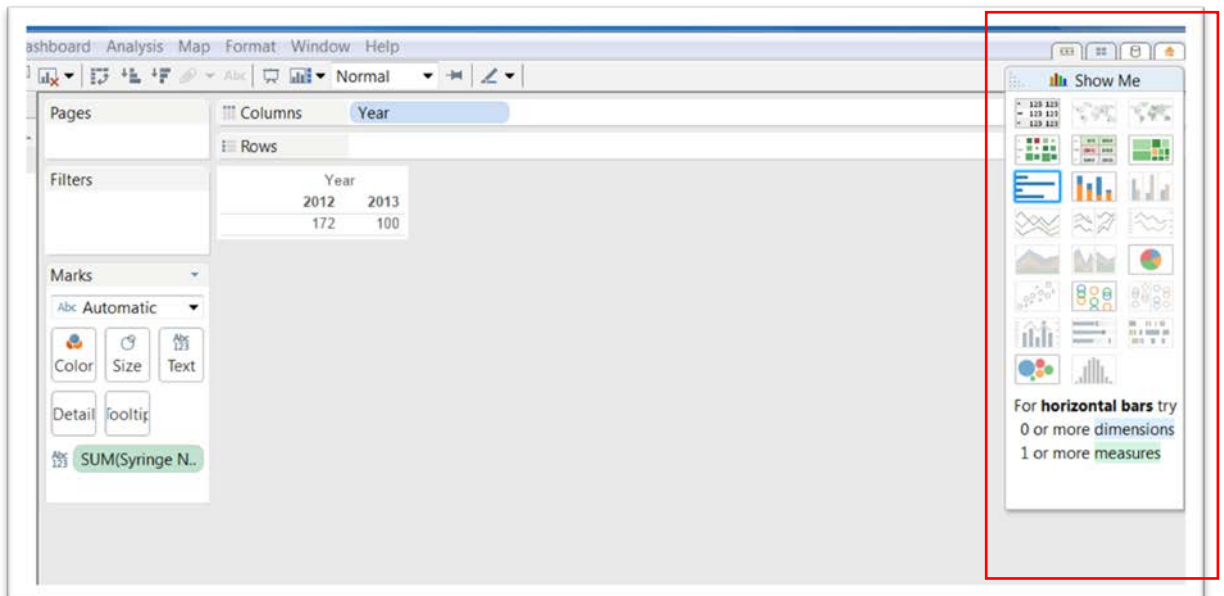
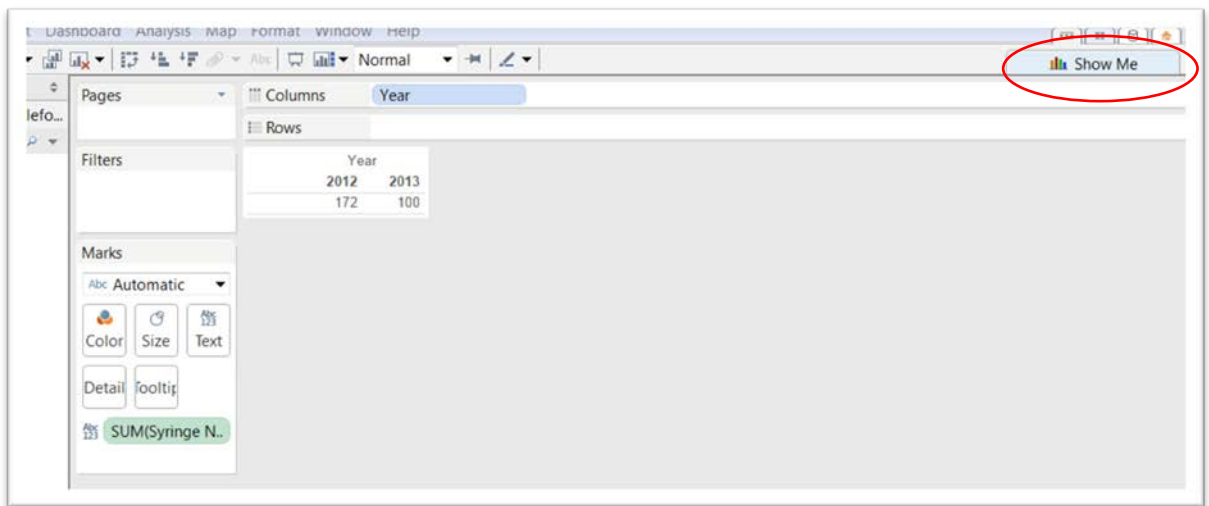
The screenshot shows the Tableau interface with a pivot table of Wards by Year. The 'Format % Difference i..' dialog box is open, showing the 'Numbers' field set to '12345600.0%'. The pivot table data is as follows:

Wards	Year	
	2012	2013
WARD 12		-57.1%
WARD 14		-46.9%
WARD 15		80.0%
WARD 16		-47.1%
WARD 11		200.0%
WARD 13		0.0%
WARD 17		33.3%
WARD 7		
WARD 1		-66.7%
WARD 10		-33.3%
WARD 18		-66.7%
WARD 19		-50.0%
WARD 2		
WARD 22		
WARD 23		0.0%
WARD 8		-66.7%
WARD 21		-100.0%
WARD 4		-100.0%
WARD 9		-100.0%

55) Label this worksheet “PercentDifference”, and go to a third worksheet.

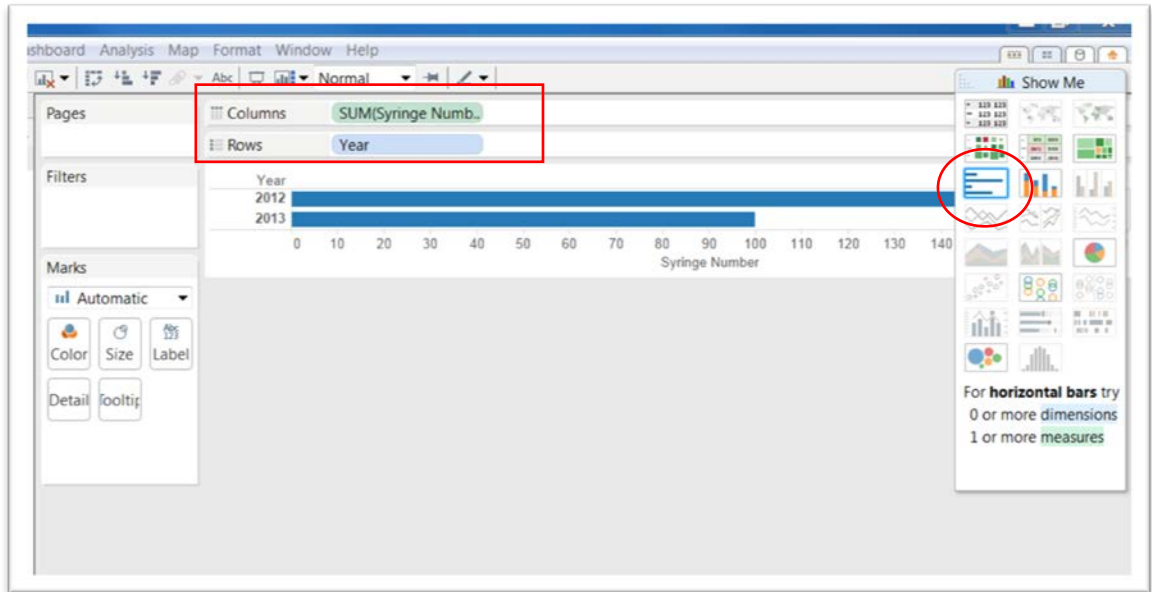


- 56) Let's call this worksheet "Chart".
- 57) Drag the "Wards" column into "Rows", drop "Syringe Number" into the table's values box (format it as a standard number which excludes the decimal places) and the "Year" into Columns.
- 58) Now we want to express these values as a bar chart.
- 59) To do so, we must select the "Show Me" icon at the top right-hand corner of the table.



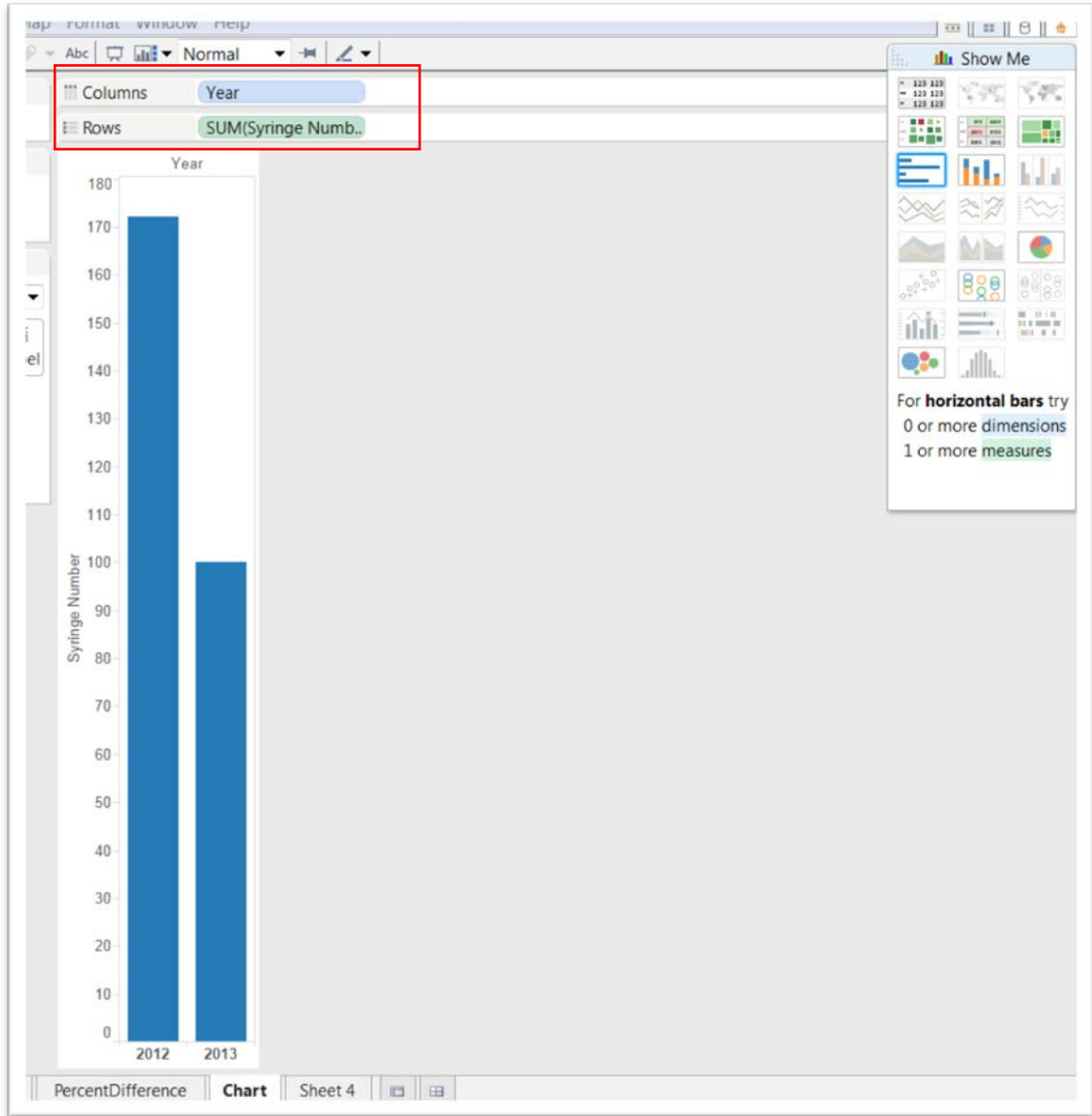
60) Show Me allows us to display the information in a variety of ways, a Tableau strength.

61) Select the horizontal bar chart icon.



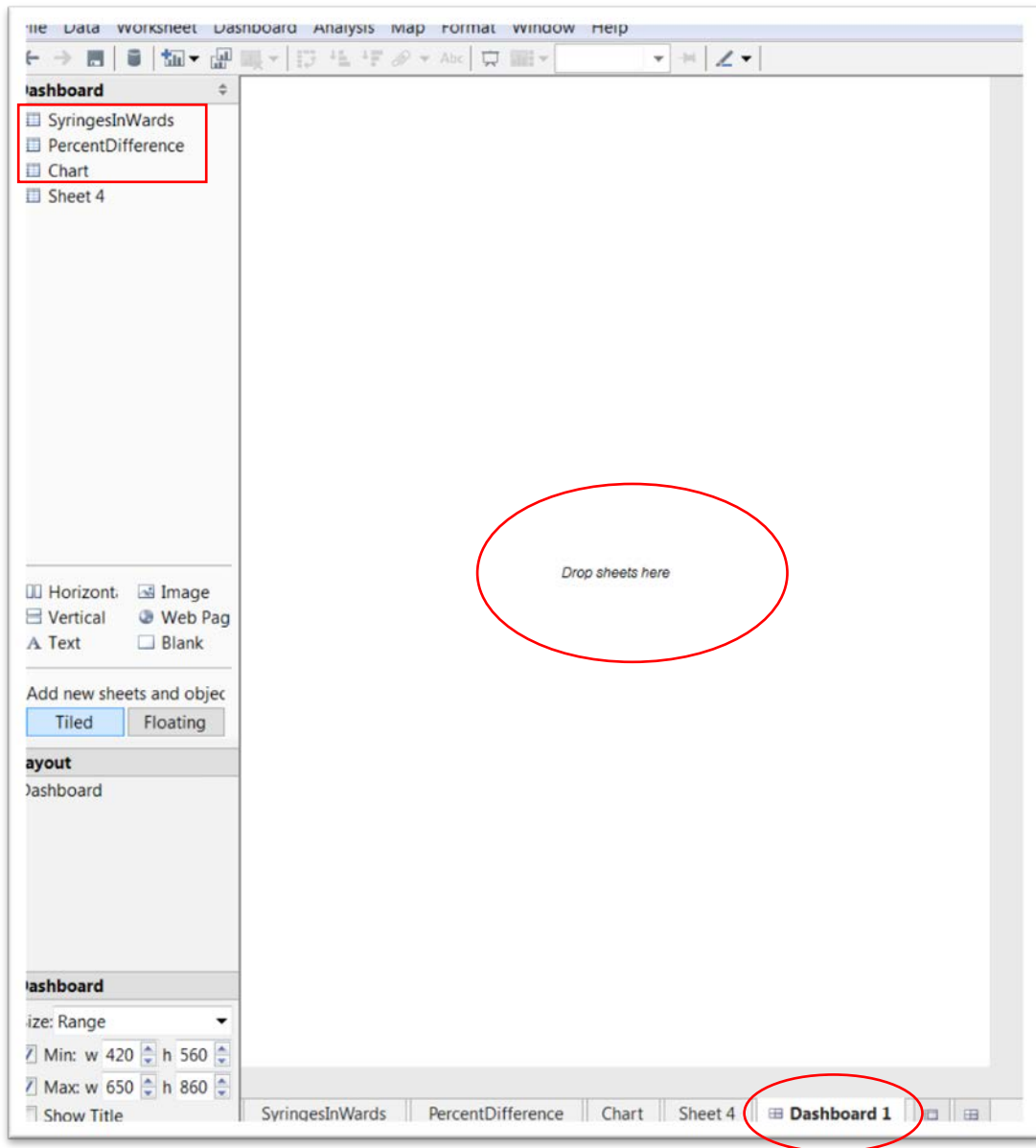
62) This option changes the orientation with the Year moving to the “Rows” section and the SUM of the syringes moving to the “Columns” section. If you want the chart displayed vertically, drag the “Year” into Columns and the <<“SUM(Syringe Numb...”>> into

Rows.



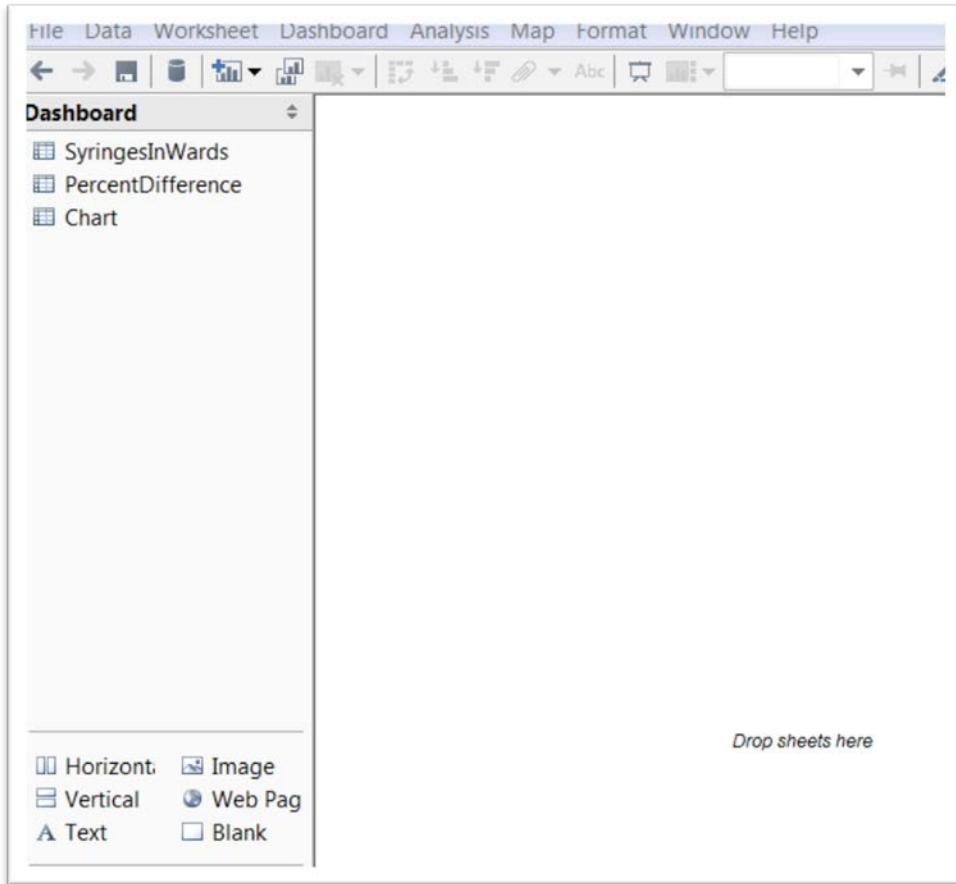
63) Now we're ready to create a "Dashboard" which will combine the three tables into an interactive display.

- 64) Right click on the next worksheet and select the “New Dashboard” option.

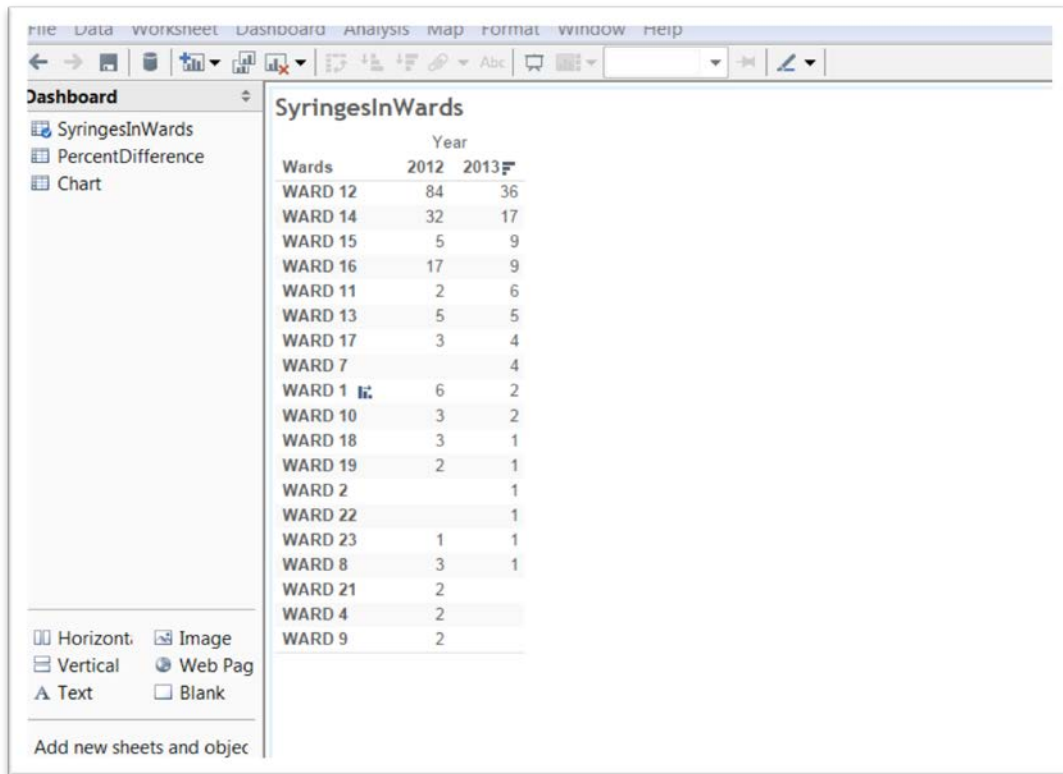


- 65) Rename the Dashboard1 worksheet, “SyringesPerWardDisplay”.

66) To the left, you'll see a "Dashboard" pane with the two tables and bar chart that we've created.



67) Drag the “SyringesInWards” icon into the “Drop sheets” area.



68) Next, drag the “PercentDifference” icon and carefully place it below “SyringesInWards”. (NOTE: This step can be a bit finicky because your placement must be exact. So you might need a



couple of tries.)

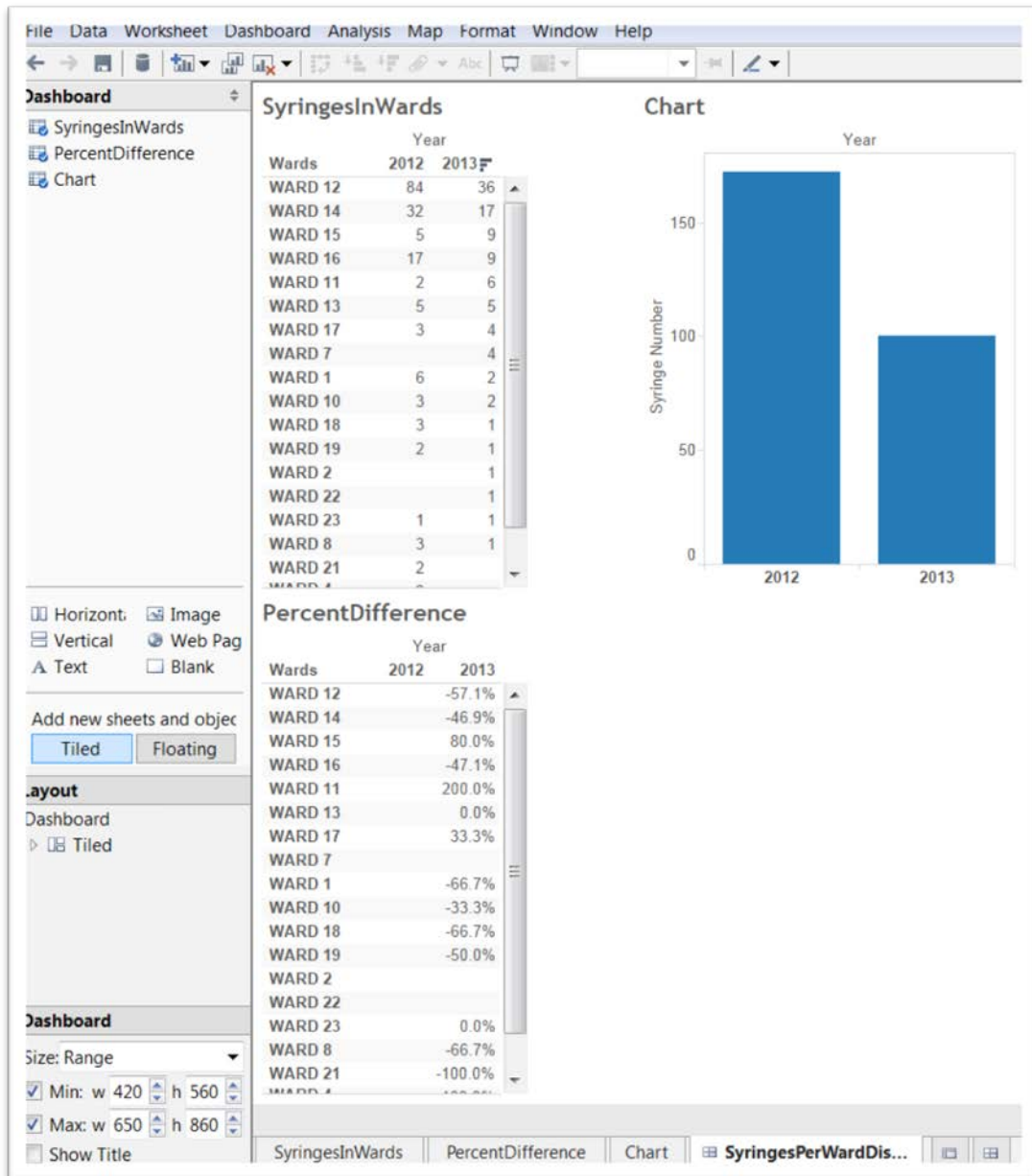
The screenshot shows a dashboard with two main data tables. The top table, 'SyringesInWards', displays the number of syringes in various wards for the years 2012 and 2013. The bottom table, 'PercentDifference', shows the percentage change in syringes for each ward from 2012 to 2013. The interface includes a menu bar, a toolbar, and a sidebar with navigation options. A red circle highlights the 'SyringesPerWardDis...' tab in the bottom right corner.

Wards	Year	
	2012	2013
WARD 12	84	36
WARD 14	32	17
WARD 15	5	9
WARD 16	17	9
WARD 11	2	6
WARD 13	5	5
WARD 17	3	4
WARD 7		4
WARD 1	6	2
WARD 10	3	2
WARD 18	3	1
WARD 19	2	1
WARD 2		1
WARD 22		1
WARD 23	1	1
WARD 8	3	1
WARD 21	2	

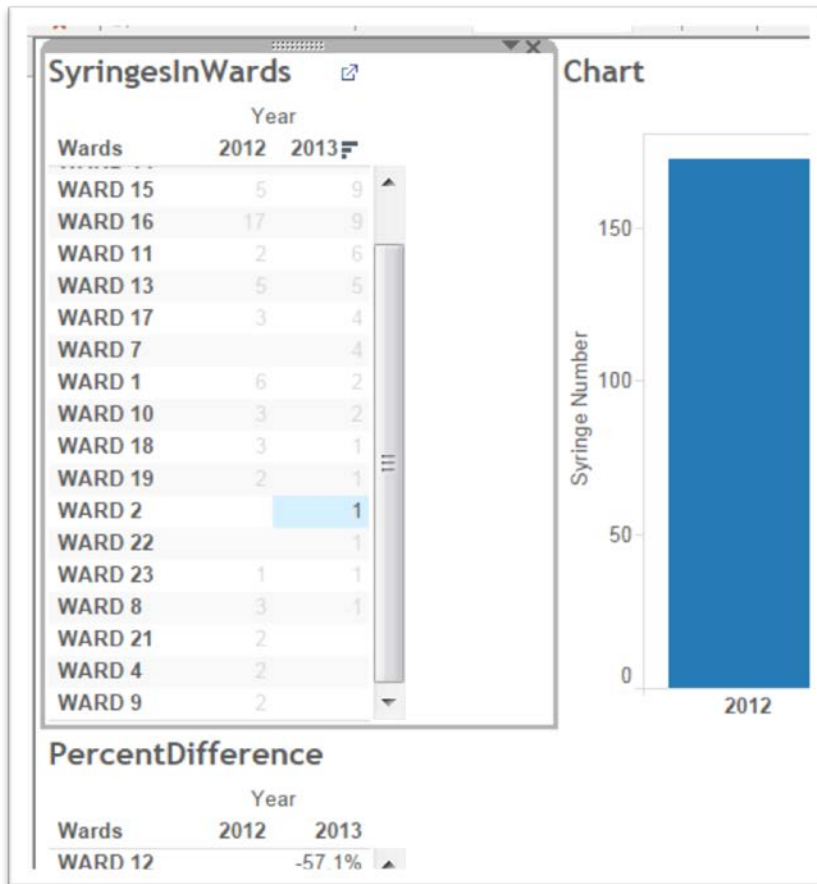
Wards	Year	
	2012	2013
WARD 12		-57.1%
WARD 14		-46.9%
WARD 15		80.0%
WARD 16		-47.1%
WARD 11		200.0%
WARD 13		0.0%
WARD 17		33.3%
WARD 7		
WARD 1		-66.7%
WARD 10		-33.3%
WARD 18		-66.7%
WARD 19		-50.0%
WARD 2		
WARD 22		
WARD 23		0.0%
WARD 8		-66.7%
WARD 21		-100.0%

69) And, finally, place the “Chart” icon to the right of “SyringesInWards”.



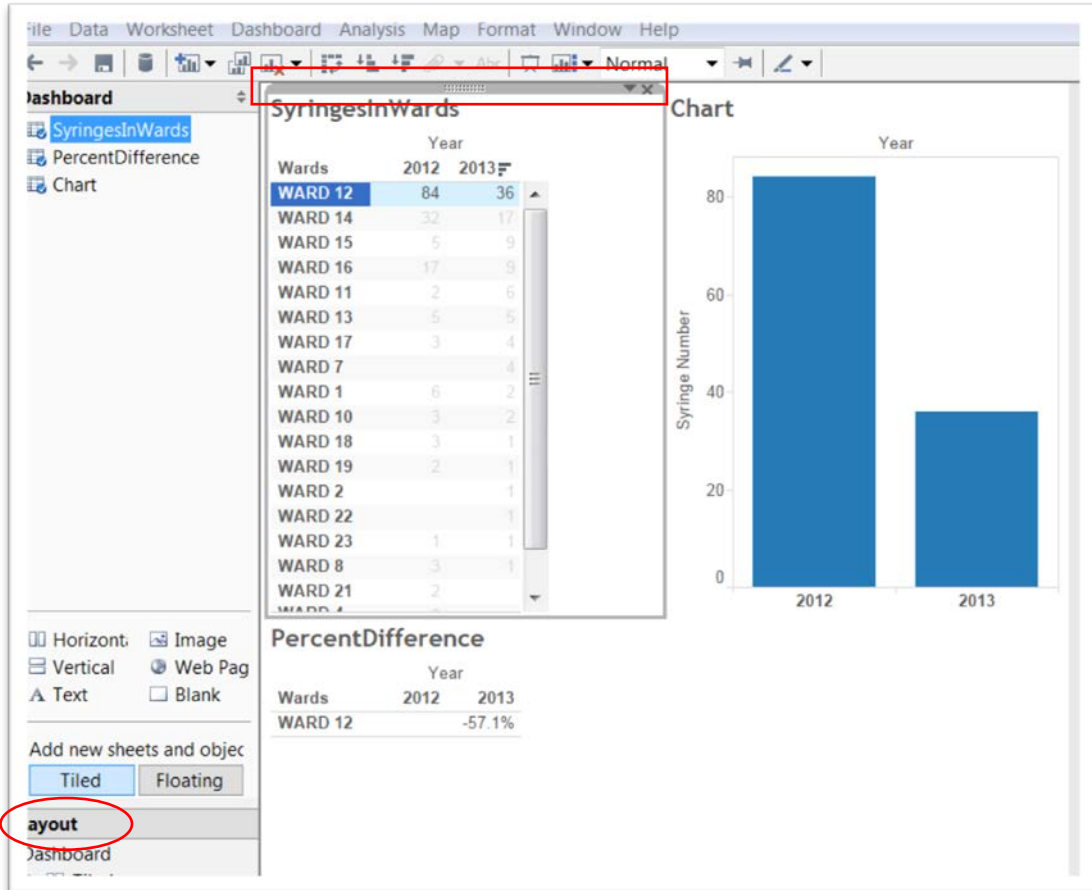
70) To make the three visualizations interactive, we’ll have to instruction Tableau to make the “SyringesInWards” the filter, meaning that clicking on a value will produce corresponding values in the other two visualizations.

71) To do this, click on the “SyringesInWards” chart to produce a grey border across the top that contains a black arrow.



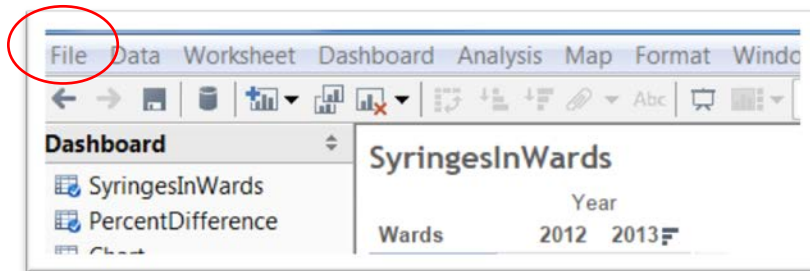
72) Click on the arrow to produce a drop-down menu, and select the “Use as Filter” option. Now when you click on Ward 12, it

produces the corresponding values in the other two visualizations.

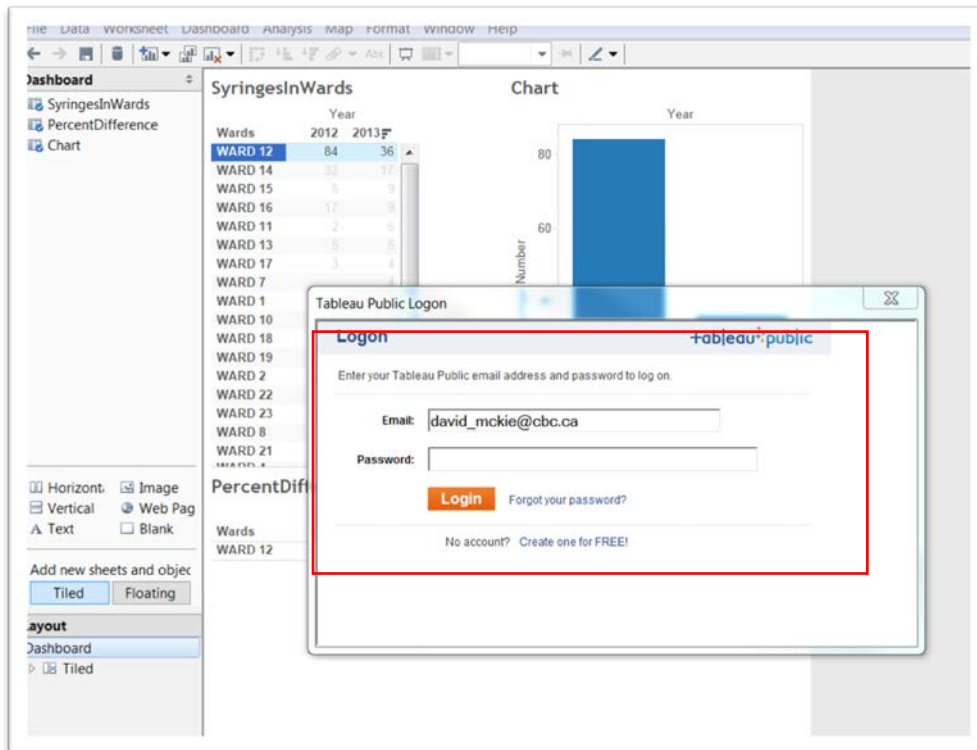


- 73)** This is the chart we will upload to the Tableau server (as is the case with Fusion Tables).
- 74)** You can also change the proportions by selecting the “Dashboard” option from the menu’s “Layout” section on the left. (NOTE: You can also do this directly in the embed code once you’ve placed it in HTML section of your blog post).

- 75) If you're happy with the result (colour of chart, sizing, etc.), save the table by going to the "File" on the menu across the top....



- 76) ... And then "Save to the Web", which will produce a "Login" dialogue box.



77) Type your password.

The screenshot shows a dashboard with three main components: a table of ward data, a bar chart, and a dialog box.

**Table Data:**

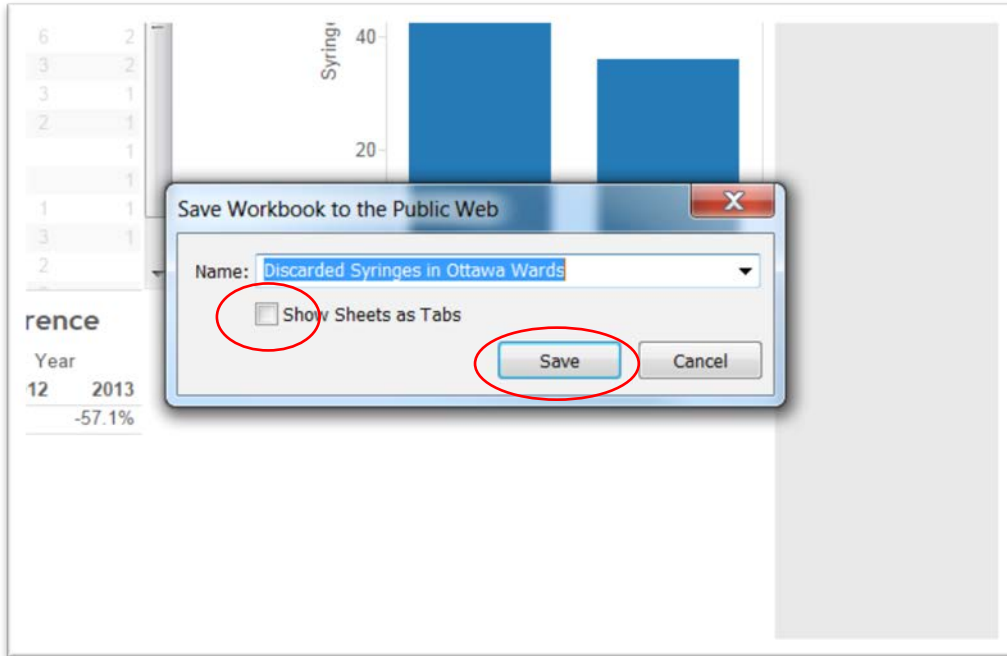
Wards	2012	2013
WARD 12	84	36
WARD 14	32	17
WARD 15	5	9
WARD 16	17	9
WARD 11	2	6
WARD 13	5	5
WARD 17	3	4
WARD 7	4	4
WARD 1	6	2
WARD 10	3	2
WARD 18	3	1
WARD 19	2	1
WARD 2	1	1
WARD 22	1	1
WARD 23	1	1
WARD 8	3	1
WARD 21	2	1

**Bar Chart:** The chart displays 'Syringe Number' on the y-axis (ranging from 0 to 80) for two categories. The first category has a value of approximately 84, and the second category has a value of approximately 36.

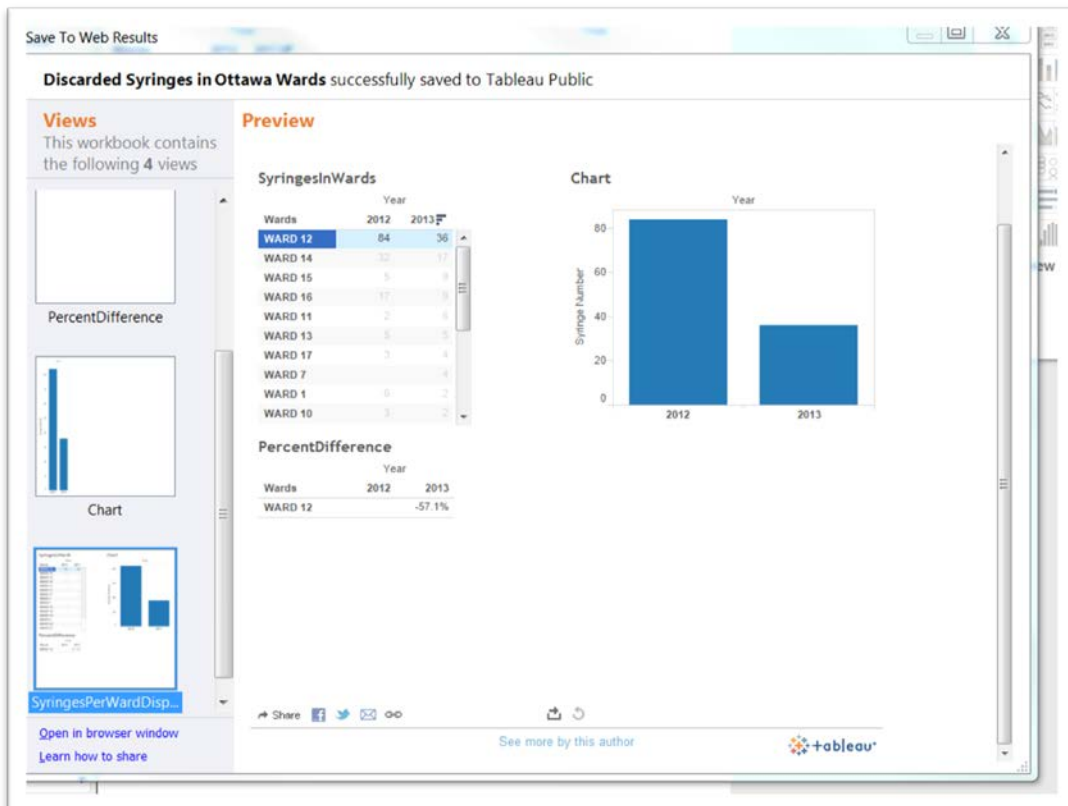
**Dialog Box:** The 'Save Workbook to the Public Web' dialog box is open. It shows the workbook name as 'Book6'. The checkbox 'Show Sheets as Tabs' is checked and circled in red. There are 'Save' and 'Cancel' buttons at the bottom.

78) You have the option to “Show Sheets as Tabs”, or just the Dashboard. Ultimately, the choice is yours, but for this exercise

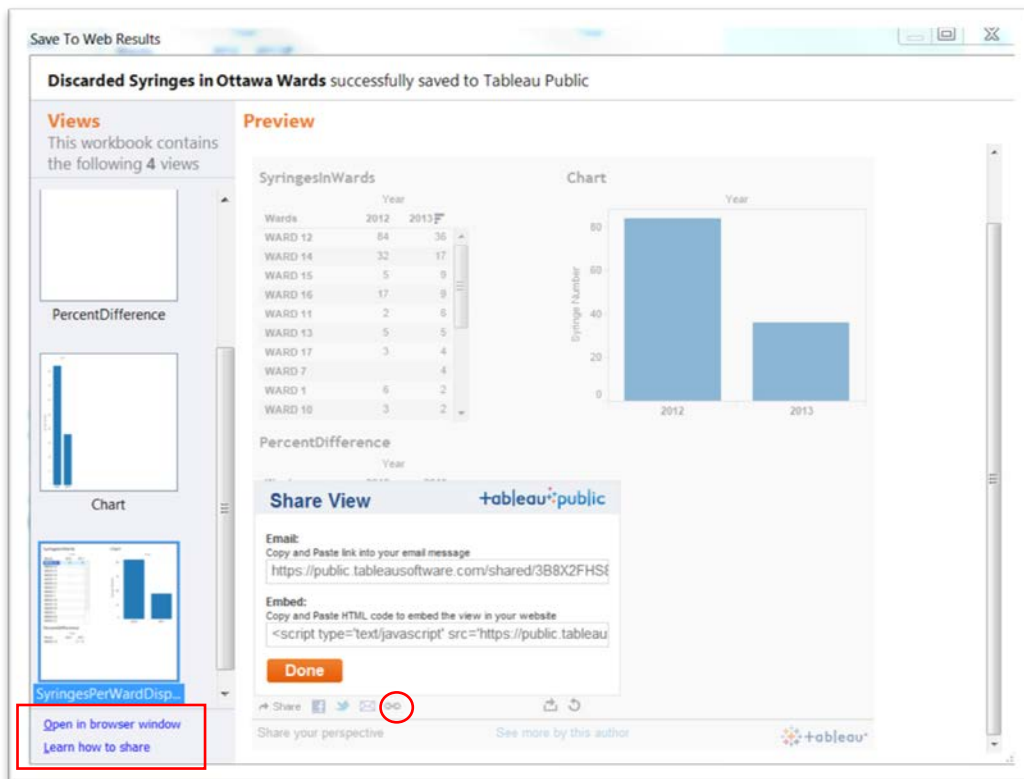
uncheck that box and give the table a name.



79) Save the result.



- 80) You can click outside the SyringesInWards table to return to display all the results. You can open the dashboard in your browser by selecting the hyperlink at the bottom left.
- 81) You can also share the visualization by selecting the hyperlink chain-link tool at the centre bottom.



- 82) And, finally, you can also take that embed code, and as we did with Fusion Tables and DocumentCloud, paste it into the HTML view of your blog, or email ( preferably in a Notepad file



that doesn't produce line breaks) to your online colleagues.

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### Discarded Syringes in Ottawa Wards

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```
<script type='text/javascript' src='https://public.tableausoftware.com/javascripts/api/viz_v1.js'>
</script><div class='tableauPlaceholder' style='width: 654px; height: 629px;'><noscript><a href='null'>
<img alt='SyringesPerWardDisplay '
src='https://public.tableausoftware.com/static/images/3B8X2FHS88#47;1_rss.png'
style='border: none' /></a></noscript><object class='tableauViz' width='654' height='629'
style='display:none;'><param name='host_url' value='https://public.tableausoftware.com/' />
<param name='path' value='shared/3B8X2FHS88' /> <param name='toolbar' value='yes' /><param
name='static_image'
value='https://public.tableausoftware.com/static/images/3B8X2FHS88#47;1.png'
/> <param name='animate_transition' value='yes' /><param name='display_static_image' value='yes' />
<param name='display_spinner' value='yes' /><param name='display_overlay' value='yes' /></object>
</div>
```

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**Format**

**Categories**

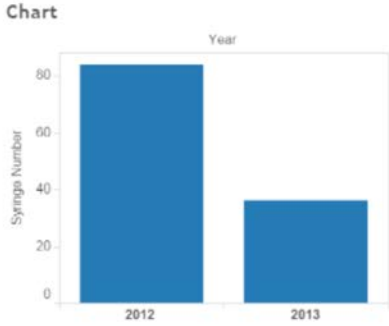
# Discarded Syringes in Ottawa Wards

October 19, 2014 Assignment 2 David McKie Edit

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SyringesInWards

Wards	Year	
	2012	2013
WARD 12	84	36
WARD 14	32	17
WARD 15	5	9
WARD 16	17	9
WARD 11	2	6
WARD 13	5	5
WARD 17	3	4
WARD 7		4
WARD 1	6	2
WARD 10	3	2



PercentDifference

Wards	Year	
	2012	2013
WARD 12		-57.1%

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83)