

# Case Study: Using Automatically Updating Graphs, or Dashboards, to Improve Data Quality

Caseworkers at a refugee resettlement organization manage most of their data using Microsoft Excel spreadsheets. One program, focusing on refugee child school enrollment, has a detailed tracker that includes both program outputs, like dates of parent-teacher meetings, and client demographics, such as name, immigration status, sex, and date of birth.

	A	B	C	D	E	F	G	H	I	J	K	L
	First Name	Last Name	Alien Number	Immig. Status	Sex	DOB	School Enrollment	Grade Level	School Name	1st Parent Meeting Due Date	1st Parent Meeting Date	
1												
2	Abdul	FARHAD	212567489	Refugee	Male	2/10/2018	8/15/2024	1st Grade	Park Elem	9/14/2024	9/15/2024	
3	Marie	SULEIMAN	212345687	Refugee	Female	3/31/2019	8/1/2024	Kindergart	Park Elem	8/31/2024	8/31/2024	
4	Elena	GONZALEZ	208349879	Asylee	Female	5/5/2013	9/1/2024	5th Grade	Lincoln Ele	10/1/2024		
5	Innocent	BULEMBO	212334378	Refugee	Female	11/1/2012	9/1/2024	5th Grade	Park Elem	9/19/2024	9/15/2024	
6	Sui Len	BIAK	212039209	Refugee	Unknown	6/17/2015	8/15/2024	2nd Grade	Park Elem	9/14/2024	9/15/2024	
7	Sharid	THAWNG	212308580	Refugee	Male	11/23/2011	8/20/2024	5th Grade	Lincoln Ele	9/19/2024	9/25/2024	
8	Ameerah	LATIEF	212493982	Refugee	Female	2/2/2013	9/1/2024	5th Grade	Lincoln Ele	10/1/2024		
9	Maria	CASTRO	212398209	Refugee	Female	3/3/2017	8/15/2024	1st Grade	Park Elem	9/14/2024	9/14/2024	
10	Ahmed	KHALEL	212393809	Refugee	Male	5/2/2009	8/16/2024	9th Grade	Downtow	9/15/2024		
11												
12												
13												

Hamza, the casework supervisor who manages the program, has found that the tracker is getting unwieldy. When the program was smaller, it was straightforward to sum up the number of participants, note their demographics and whether parent-teacher meetings were held, and create summary tables every month. Now participation has doubled, and compiling the data is so time-consuming that Hamza has gone three months without finding the time. Worse, even though standard procedure is to input data at least weekly, he's concerned that caseworkers are so busy that they're not updating the spreadsheet. But he doesn't have time to read through it each week to find out!

Looking ahead, Hamza is afraid he won't get around to analyzing program data until mid-year reporting. At that point, if there are any problems with or questions about the data, it will be too late to resolve them. He's learned that Excel has some functions that can make program monitoring and data quality assurance much easier, if he puts in some time to set them up. Hamza decides to clear his calendar one afternoon and improve the program spreadsheet.

First of all, he knows he'll have a much easier time analyzing this data if he can filter and sort it quickly, so he begins by highlighting the data, navigating to the "Styles" tab of the Home menu, and clicking "Format as Table." This will enable filtering and sorting, and have the added bonus of preventing him or his staff from accidentally shifting the rows or columns.

	A	B	C	D	E	F	G	H	I	J	K	L
	First Name	Last Name	Alien Number	Immig. Status	Sex	DOB	School Enrollment	Grade Level	School Name	1st Parent Meeting Due Date	1st Parent Meeting Date	
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2	Abdul	FARHAD	212567489	Refugee	Male	2/10/2018	8/15/2024	1st Grade	Park Elementary	9/14/2024	9/15/2024	
3	Marie	SULEIMAN	212345687	Refugee	Female	3/31/2019	8/1/2024	Kindergarten	Park Elementary	8/31/2024	8/31/2024	
4	Elena	GONZALEZ	208349879	Asylee	Female	5/5/2013	9/1/2024	5th Grade	Lincoln Element	10/1/2024		
5	Innocent	BULEMBO	212334378	Refugee	Female	11/1/2012	9/1/2024	5th Grade	Park Elementary	9/19/2024	9/15/2024	
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8	Ameerah	LATIEF	212493982	Refugee	Female	2/2/2013	9/1/2024	5th Grade	Lincoln Element	10/1/2024		
9	Maria	CASTRO	212398209	Refugee	Female	3/3/2017	8/15/2024	1st Grade	Park Elementary	9/14/2024	9/14/2024	
10	Ahmed	KHALEL	212393809	Refugee	Male	5/2/2009	8/16/2024	9th Grade	Downtown High	9/15/2024		
11												
12												
13												

Knowing he'll need it shortly, Hamza checks the name of the new table. In his version of Excel (2025), he clicks "Table Design," looks under "Table Name" on the "Properties" tab, and sees that it's been labeled Table1.

Hamza then adds a new sheet and considers what visuals he wants to create in order to monitor program data. He decides that breaking down the data by immigration status, sex, and school name would be most useful—graphing those three indicators will give him a fast look at the basic status of the program.

Starting with immigration status, he types out a simple, two-column chart. For a top left header, he writes the data point of interest, Immigration Status, and fills in the possible choices below: Refugee, A2, and Asylee, A3. For a top right header, he types Total, then begins to write a function (a predefined formula) in cell B2:

	A	B
1	Immigration Status	Total
2	Refugee	<input type="text" value="=COUNTIF(Table1[Immig. Status],A2)"/>
3	Asylee	

As new rows are added to the program spreadsheet (Table 1), this function will automatically calculate the updated number of clients whose immigration status is "refugee." But how does it break down?

**=COUNTIF(Table1[Immig. Status],A2)**

Tell me the number of cells that meet these criteria:

Of all rows in Table 1, how many...

...have text in the "Immig. Status" column...

...that matches the text in Cell A2 (in this case, "refugee")?

Different versions of this one function will meet all of Hamza’s needs. He drags it down into cell B3, and Excel automatically updates the reference to the Asylee cell, A3:

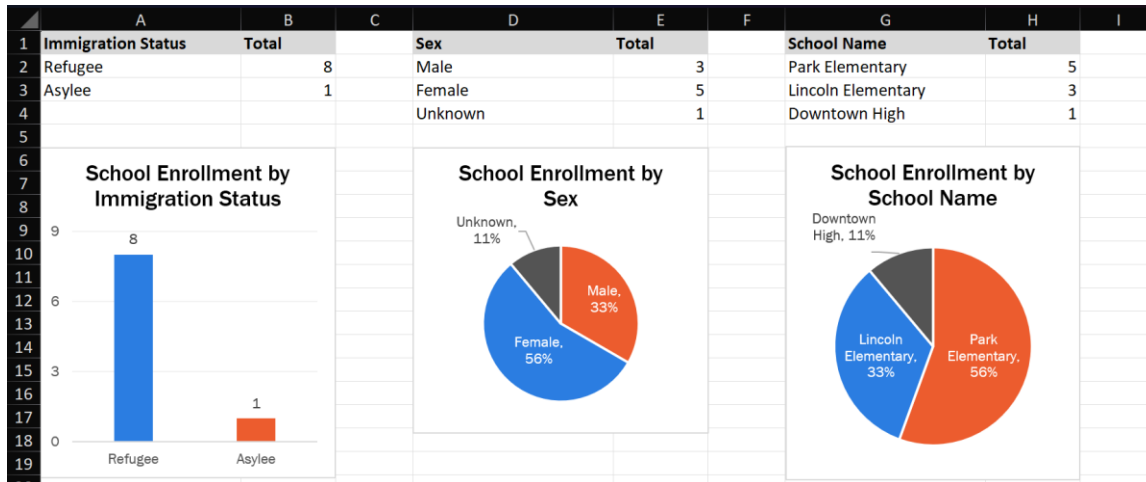
	A	B
1	<b>Immigration Status</b>	<b>Total</b>
2	Refugee	8
3	Asylee	

=COUNTIF(Table1[Immig. Status],A3)

This chart now has built-in calculators for each total. Hamza repeats the process for the other data he’s interested in: school enrollment by sex and by school name.

Now all he has to do is add in a few simple graphs pulling from these charts, as he normally would. Of course, the big difference is that this might be the last time he creates graphs for these indicators—going forward, as his staff update Table 1 with new rows, the charts will update accordingly, and so will his corresponding graphs!

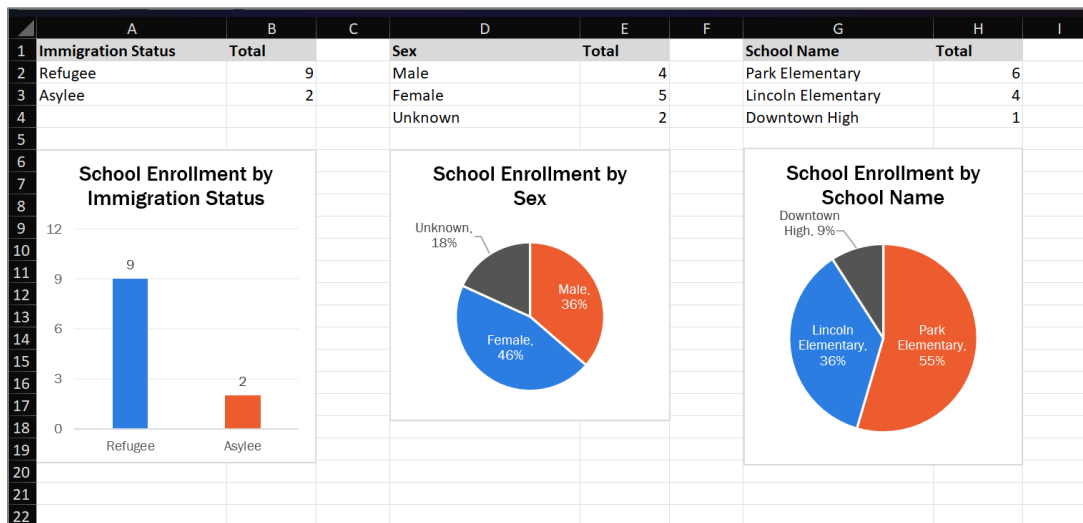
The Excel sheet is starting to look really useful, with three automatically updating graphs, or dashboards:



To test them out, he adds two new rows to Table 1:

Husni	AL HARIRI	212938028	Refugee	Unknown	5/5/2018	8/15/2024	1st Grade	Lincoln Element	9/13/2024
Angel	TAMAYO	209497208	Asylee	Male	4/2/2017	9/5/2024	1st Grade	Park Elementary	9/23/2024

All three charts update accordingly, as do the three corresponding dashboards:



Now, Hamza can scan the program status whenever he likes, in a fraction of the time it would take to manually create just one graph. He may have to troubleshoot some errors if any data is entered incorrectly, but he'll save time overall. It will also be feasible to add other data to the charts and graphs, such as average time before first parent meeting, to help monitor the program even more closely. Reporting will be far quicker and easier, too.

Reviewing the new graphs, Hamza takes one last action. He notices high enrollment at the elementary school level, but very few participants from Downtown High School. In fact, the chart shows that only one high school student has been enrolled to date in this fiscal year.

Hamza suspects this is a data quality issue: he's confident there have been several enrollments of high school students in the past two months. He makes a note to follow up during the next casework staff meeting. Hamza will confirm whether everyone is up to date on data entry. If so, they'll brainstorm ways they might increase outreach to parents of high school-aged clients and improve their participation in the program. If not, he'll check if adjustments should be made to his staff's workloads to allow them time to catch up, or if the team can get more data entry support from interns. Knowing that data quality is critical to program success, Hamza will ensure time allows for data to be captured completely, correctly, and on time—fully in line with standard operating procedures.

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