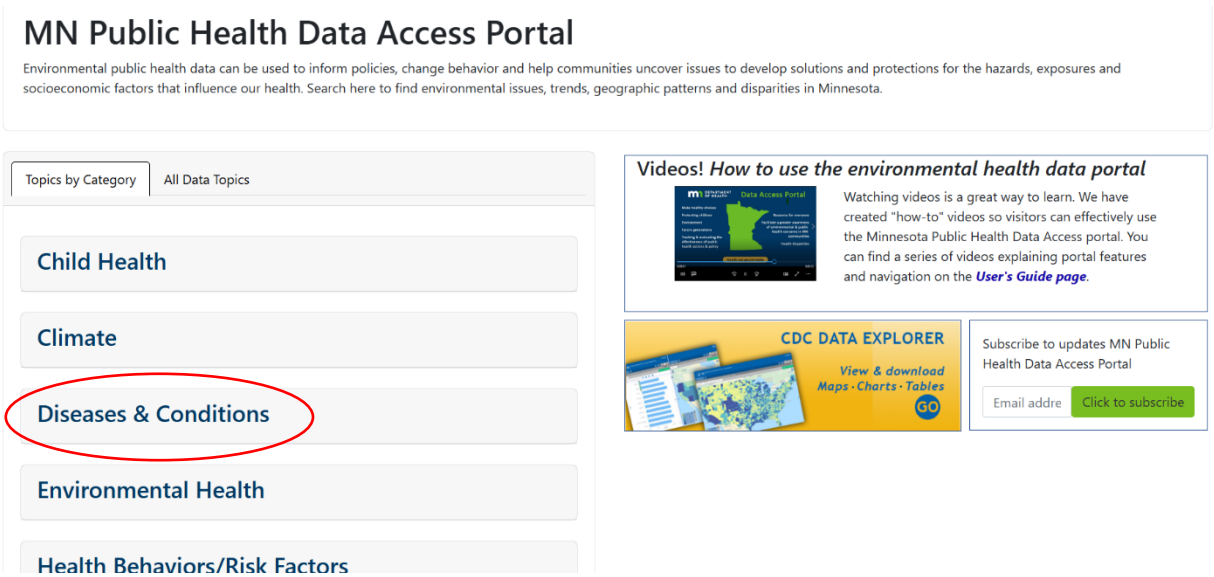
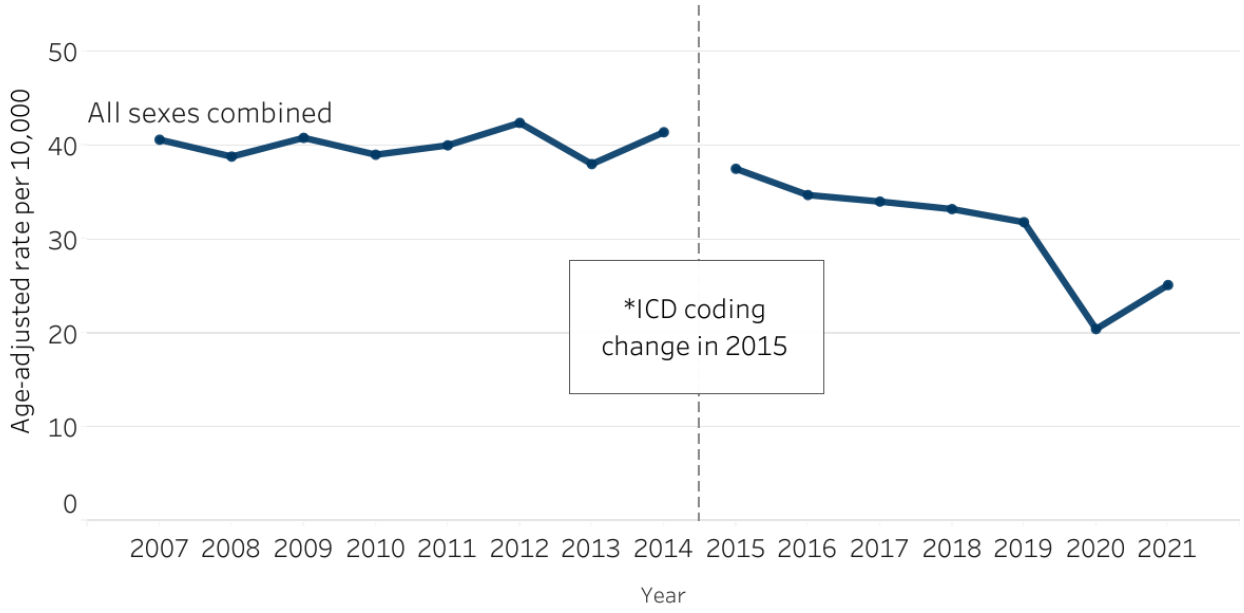
Minnesota Department of Public Health Data Access Portal home page. Click on “Minnesota Public Health Data Access Portal.”

Click on “Diseases & Conditions,” and then click on “Asthma.”

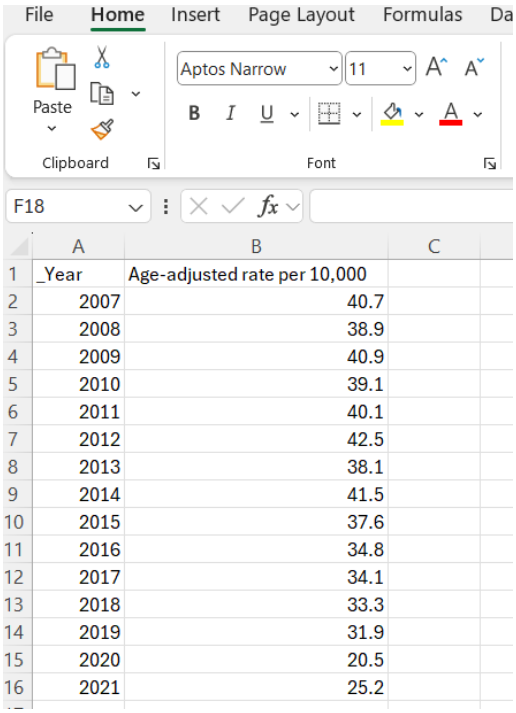


Click on the blue button that says, “View Charts in Maps,” and you will be able to see the charts below.

Figure 1. Asthma ED visit rates in Minnesota

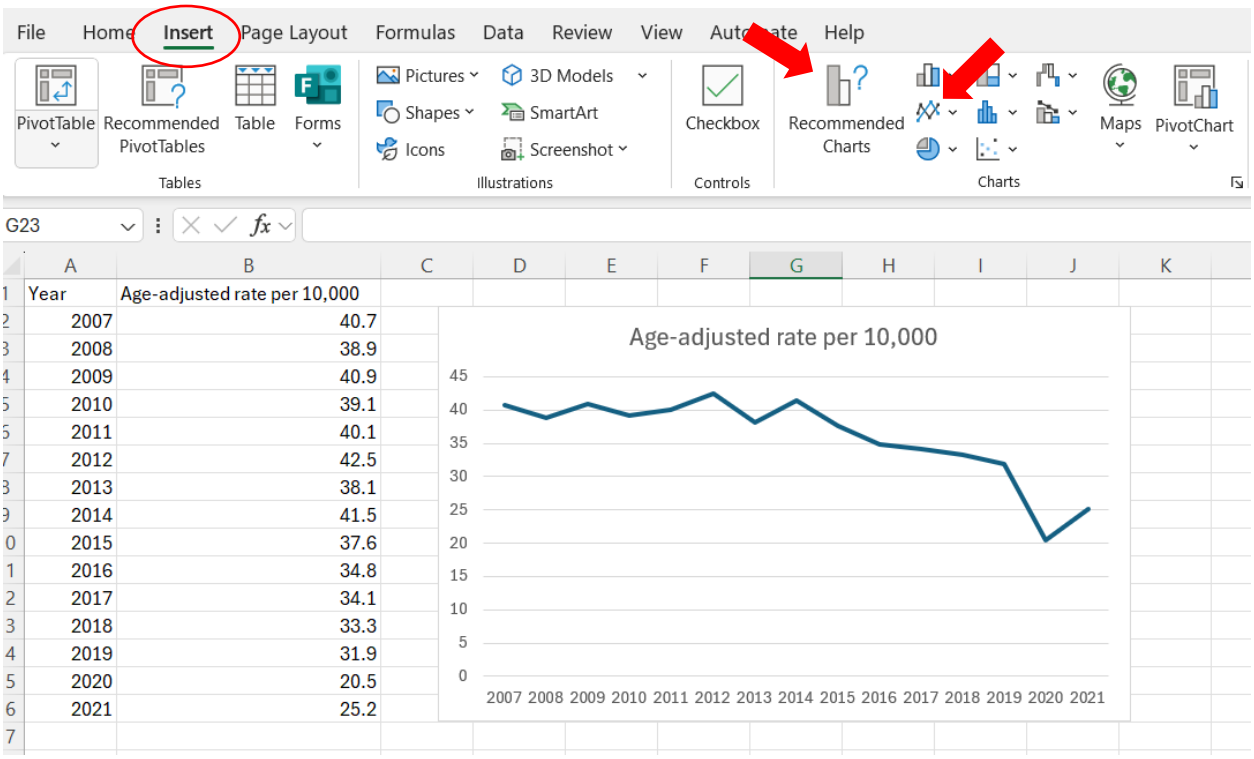


We will recreate this line chart in Excel. Download the CSV by hitting the download button located above the line chart. Open the Excel file and copy and paste the data we need for the line chart into a new Excel document. The data that you want on the x-axis should always be the first or leftmost column.

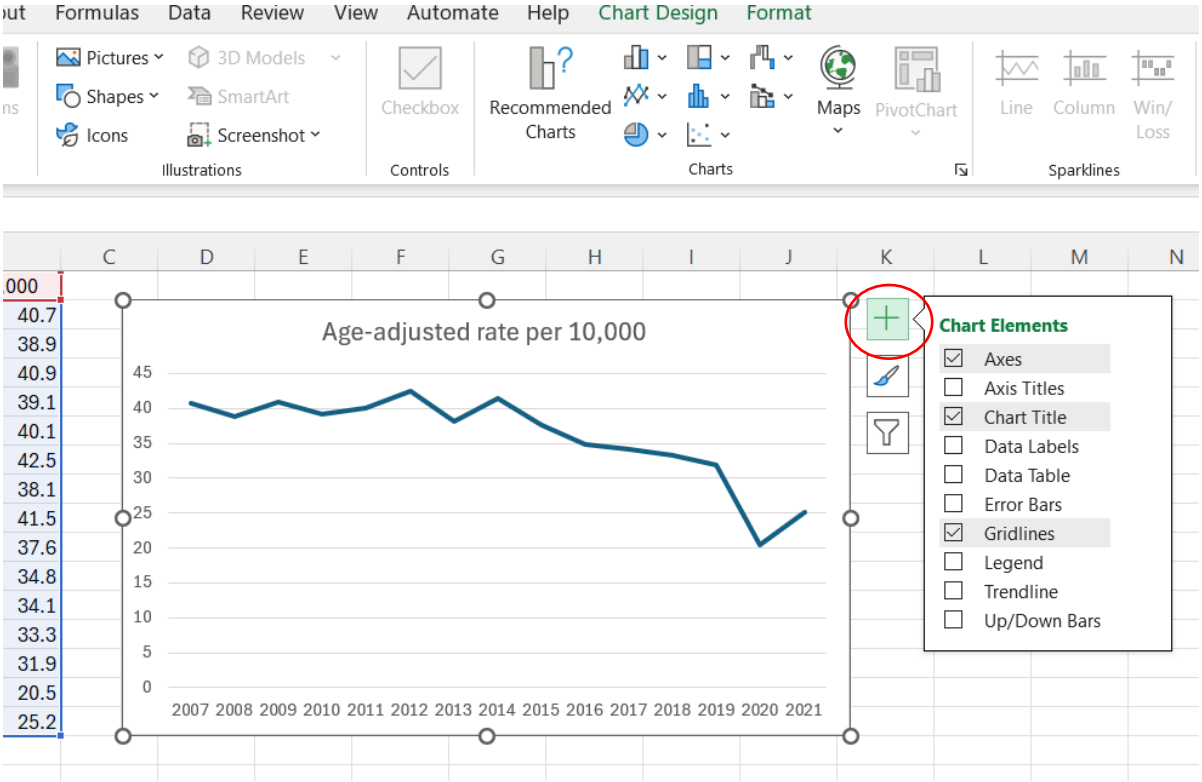


	A	B	C
1	_Year	Age-adjusted rate per 10,000	
2	2007	40.7	
3	2008	38.9	
4	2009	40.9	
5	2010	39.1	
6	2011	40.1	
7	2012	42.5	
8	2013	38.1	
9	2014	41.5	
10	2015	37.6	
11	2016	34.8	
12	2017	34.1	
13	2018	33.3	
14	2019	31.9	
15	2020	20.5	
16	2021	25.2	

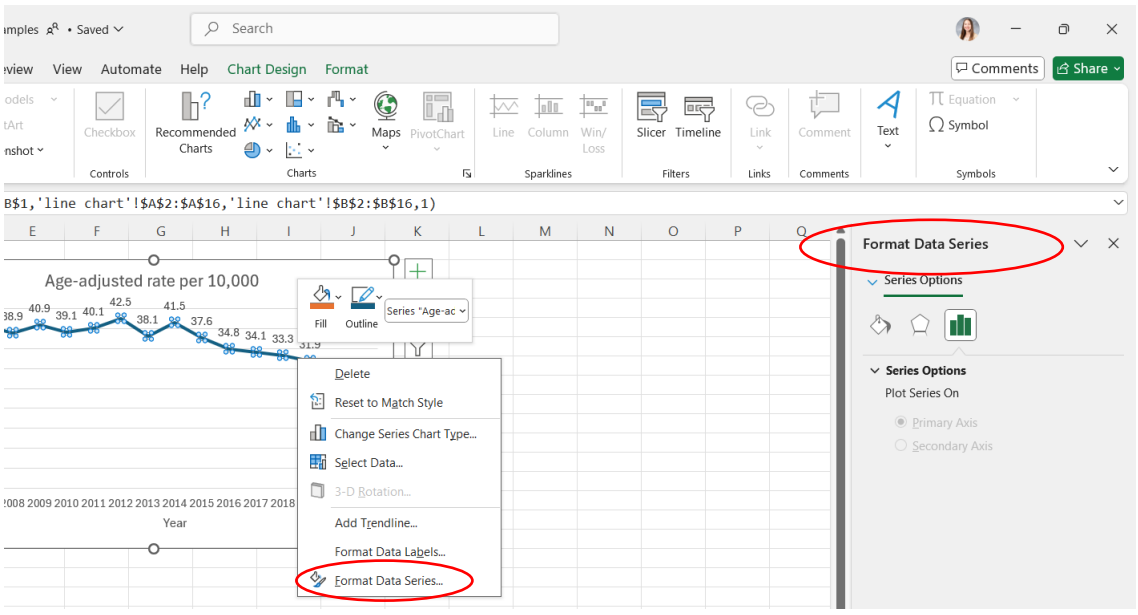
Highlight the data, click the “Insert” tab at the top of the Excel document, and then choose the “line chart” option from the “charts” section. In this case, a scatterplot chart would work as well, but it would look slightly different than the line chart. The “Recommended Charts” feature could also be useful if you are unsure what chart to choose.



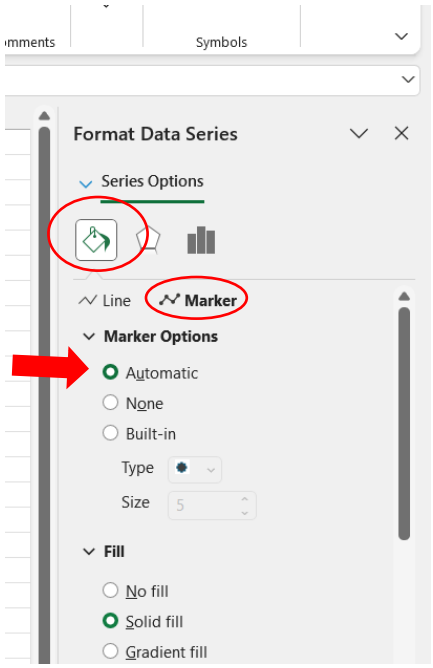
Click on the chart, and a green plus button will appear. This is the “chart elements” button, and it lets you add features such as chart titles, axis titles, and data labels.



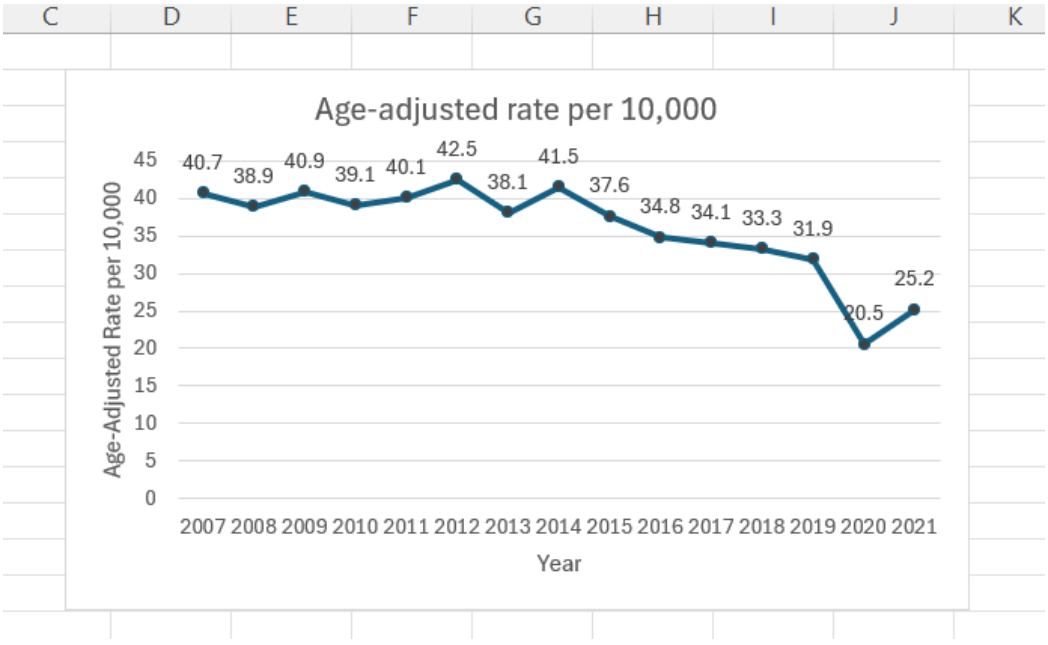
Use these options to add axis titles and data labels. Additionally, we can add markers to the line to make it easier to see what data point corresponds with what year. Right click on the trendline and then click the bottom option that says, “format data series.” This will open a menu on the left side of the screen.



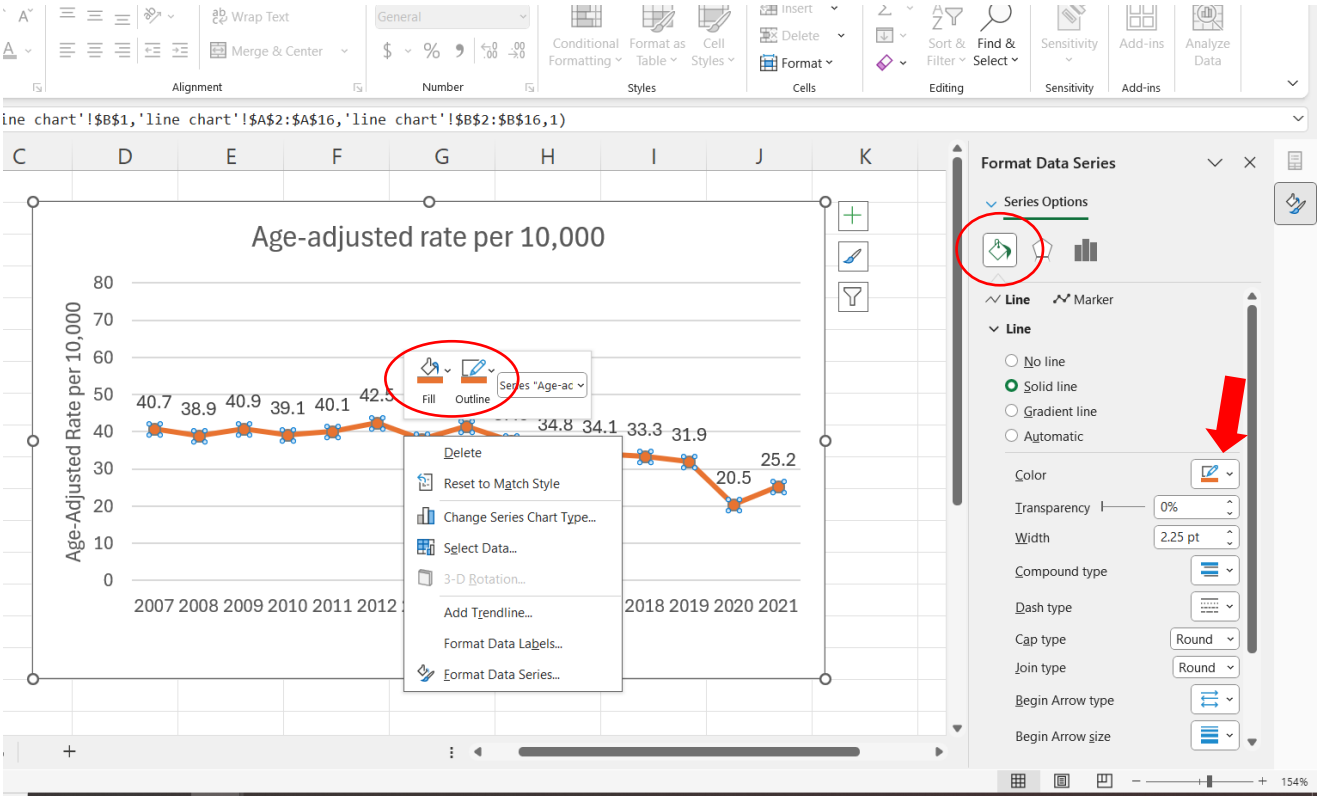
Click on the paint bucket icon under series options, under the paint bucket select the marker icon, and then under “marker options” choose automatic.



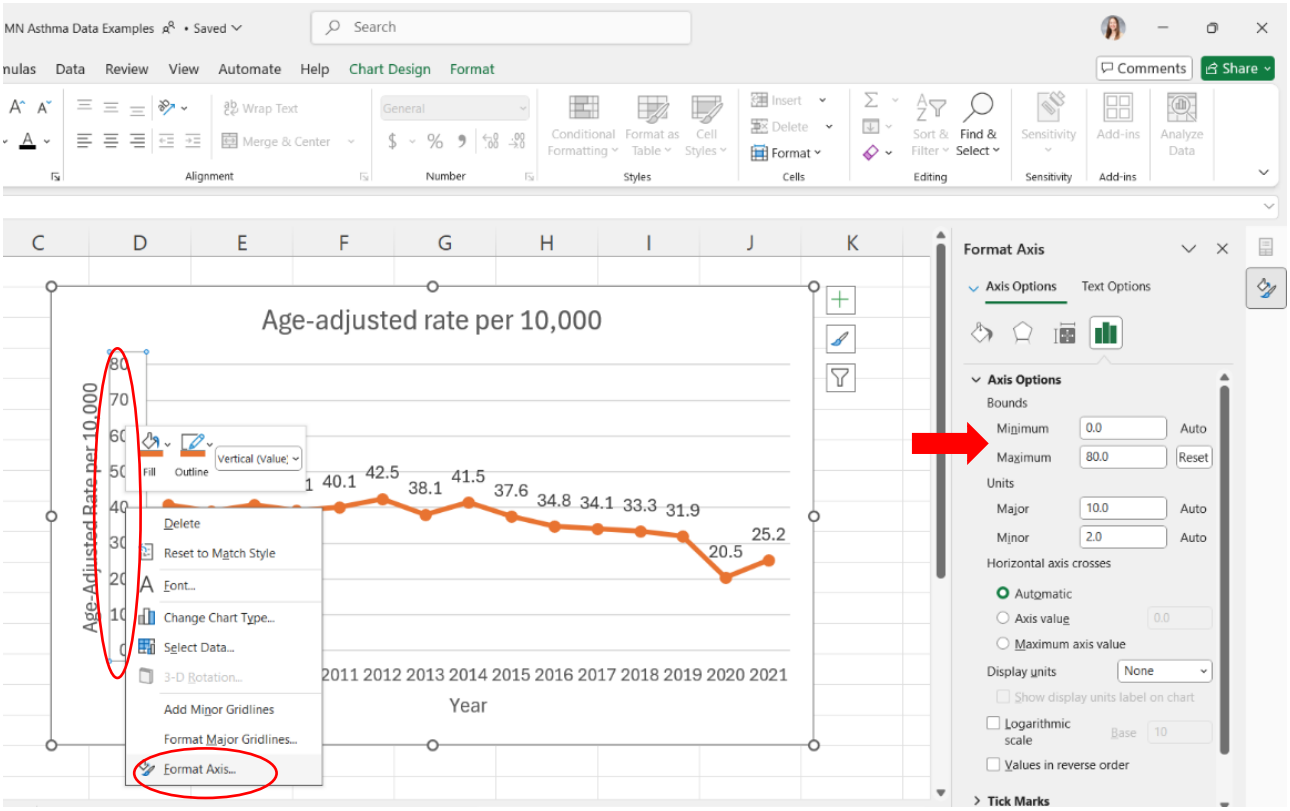
The line chart should look like this when done.



To change the color of the line and markers, right click on the line, and above the menu that pops up, you should see a shortcut where you can change the fill and the outline of the line on the chart. Additionally, you can also change the color, and other aspects of the line such as the width, by opening the “format data series” menu and selecting the paint bucket.



We can change the scale of the y-axis by right clicking on the axis numbers and clicking “Format axis.” A similar side menu will appear, and then the minimum and maximum numbers on the y-axis can be changed.



After changing the maximum number to 80, the chart will look like this.

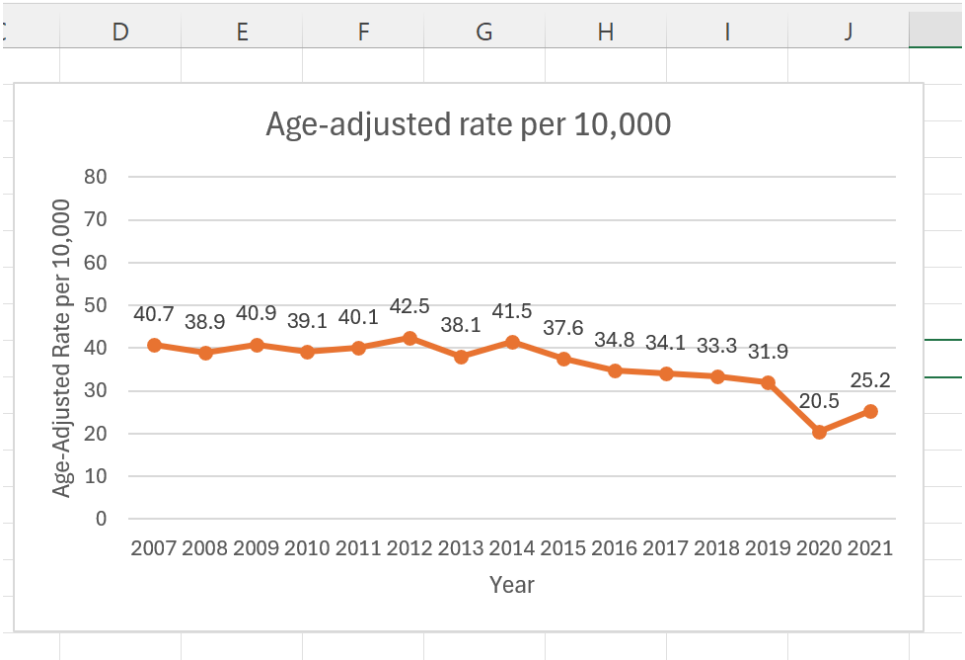
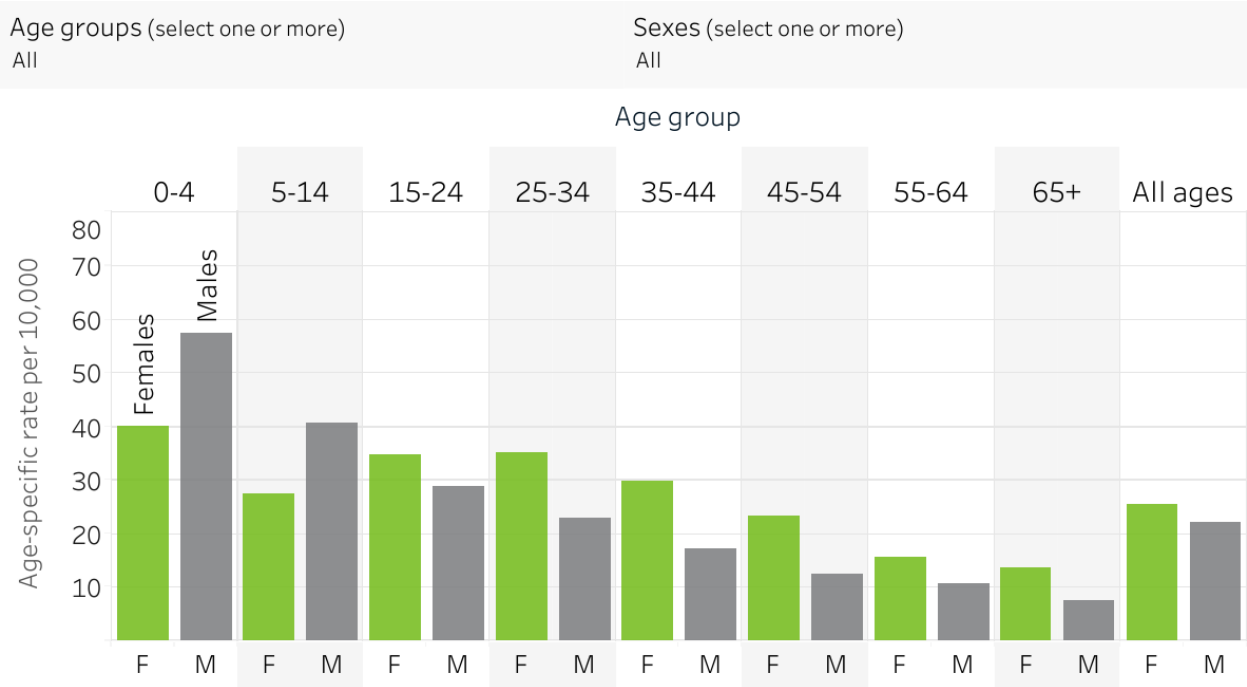
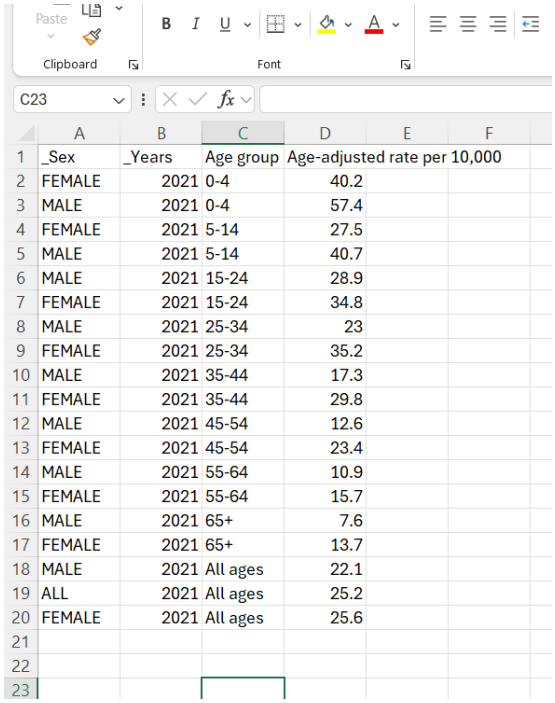


Figure 2. Asthma ED visit rates in Minnesota, by age and sex in 2021

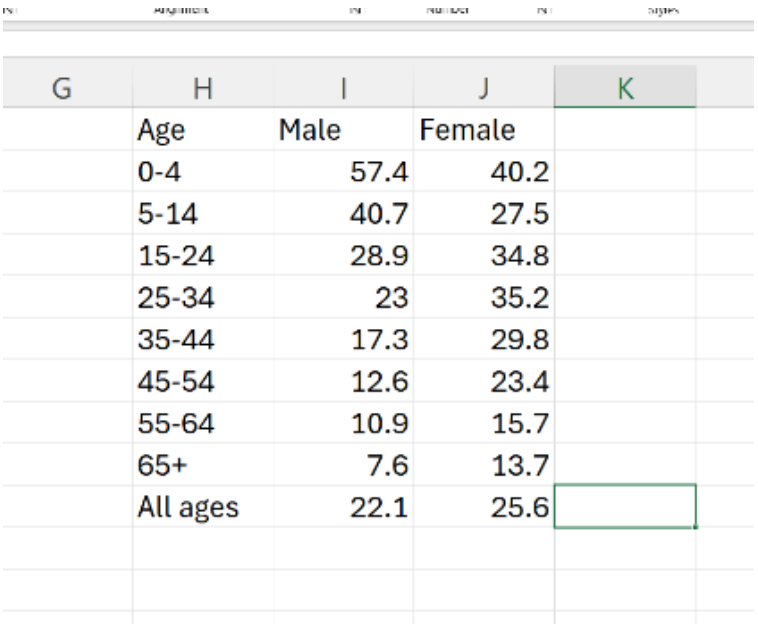


Now we will recreate this bar chart in Excel. First, download the data from the MN data portal like we did in the line chart example, and then copy it into a new Excel document.



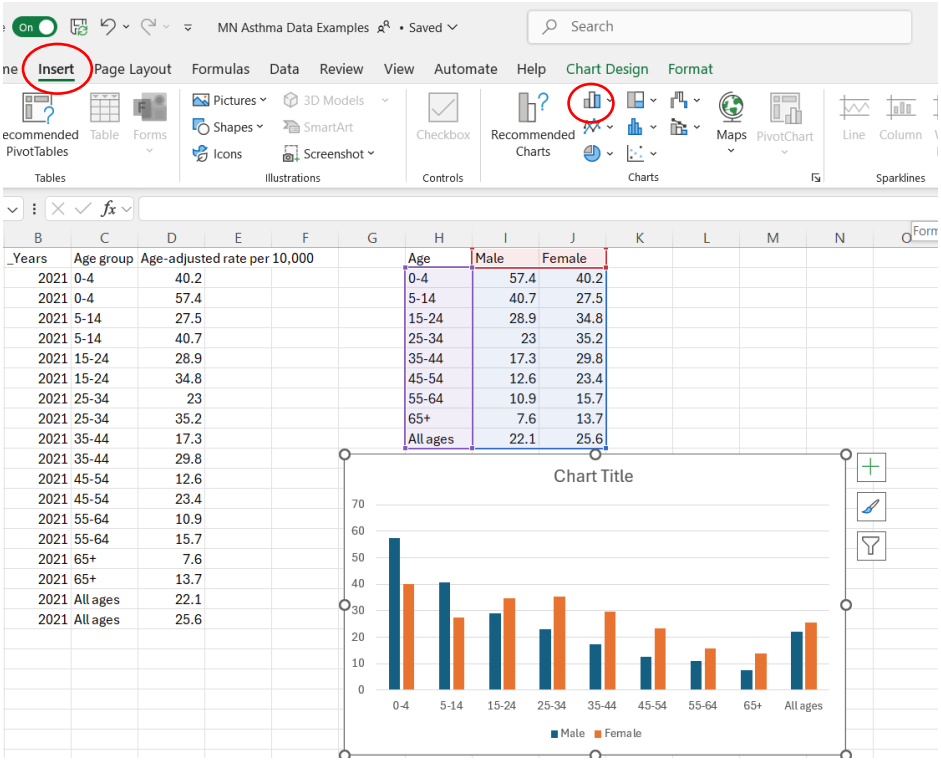
	A	B	C	D	E	F
1	_Sex	_Years	Age group	Age-adjusted rate per 10,000		
2	FEMALE	2021	0-4	40.2		
3	MALE	2021	0-4	57.4		
4	FEMALE	2021	5-14	27.5		
5	MALE	2021	5-14	40.7		
6	MALE	2021	15-24	28.9		
7	FEMALE	2021	15-24	34.8		
8	MALE	2021	25-34	23		
9	FEMALE	2021	25-34	35.2		
10	MALE	2021	35-44	17.3		
11	FEMALE	2021	35-44	29.8		
12	MALE	2021	45-54	12.6		
13	FEMALE	2021	45-54	23.4		
14	MALE	2021	55-64	10.9		
15	FEMALE	2021	55-64	15.7		
16	MALE	2021	65+	7.6		
17	FEMALE	2021	65+	13.7		
18	MALE	2021	All ages	22.1		
19	ALL	2021	All ages	25.2		
20	FEMALE	2021	All ages	25.6		
21						
22						
23						

Delete row 19, as we do not need that data in this analysis. We also will not need to highlight the year column, since the data is all the same year, it can be part of the title. Additionally, Excel does not understand how to read the data due to how it is currently structured, so we need to build a new table, using the column headings “age,” “male,” and “female.”



	Age	Male	Female
	0-4	57.4	40.2
	5-14	40.7	27.5
	15-24	28.9	34.8
	25-34	23	35.2
	35-44	17.3	29.8
	45-54	12.6	23.4
	55-64	10.9	15.7
	65+	7.6	13.7
	All ages	22.1	25.6

Highlight this new table and go to the “insert a table or bar chart option” on the insert tab.

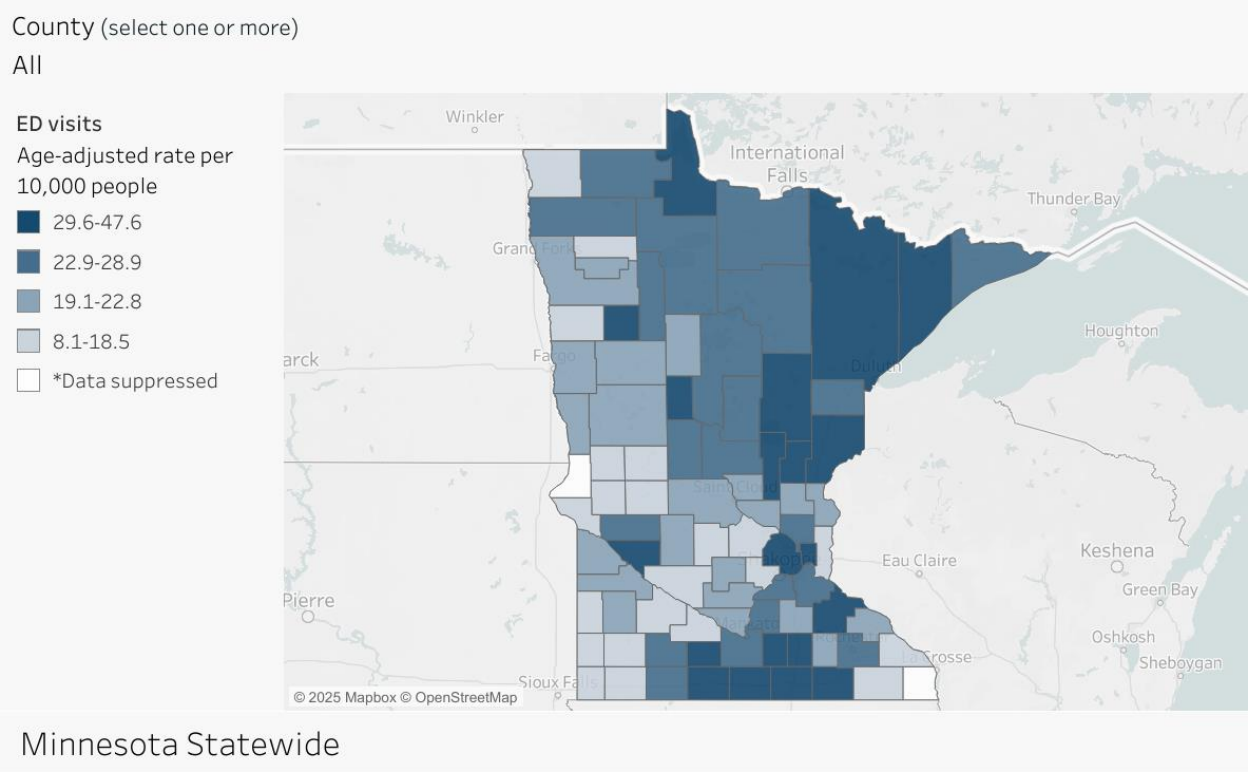


_Years	Age group	Age-adjusted rate per 10,000
2021	0-4	40.2
2021	0-4	57.4
2021	5-14	27.5
2021	5-14	40.7
2021	15-24	28.9
2021	15-24	34.8
2021	25-34	23
2021	25-34	35.2
2021	35-44	17.3
2021	35-44	29.8
2021	45-54	12.6
2021	45-54	23.4
2021	55-64	10.9
2021	55-64	15.7
2021	65+	7.6
2021	65+	13.7
2021	All ages	22.1
2021	All ages	25.6

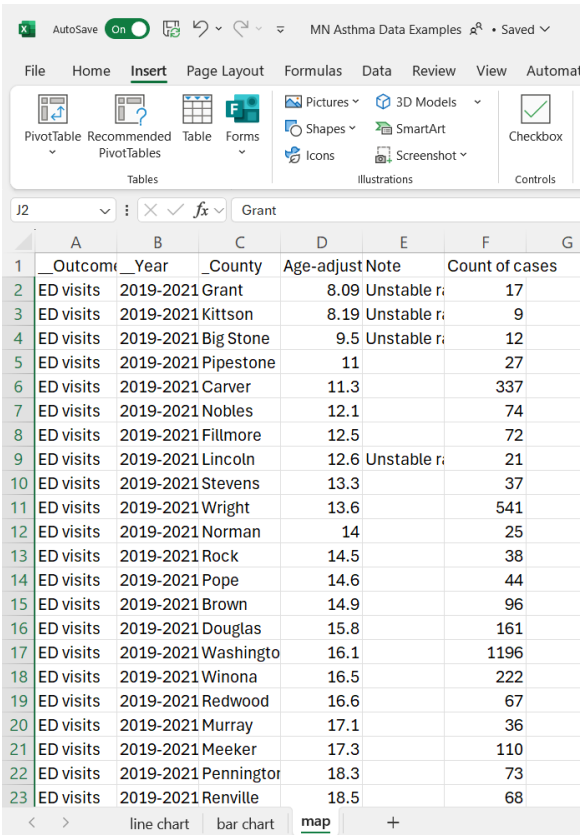
Additionally, if you are unsure how to rebuild a table in Excel, you can try highlighting the data as it is and click the “recommended charts” button. If you see a chart that look like what you are trying to show, you can click on it and Excel will rebuild the data into a new table for you and also create the chart on a new Excel sheet.

Axis titles, data labels, and the y-axis scale can be edited on a bar chart in the same way as in the previous example.

Figure 3. Asthma ED visit rates for 2019-2021 by county



Now we will recreate this map using the map function in Excel. Download the data and copy the “ED Visit” data into a new excel document.

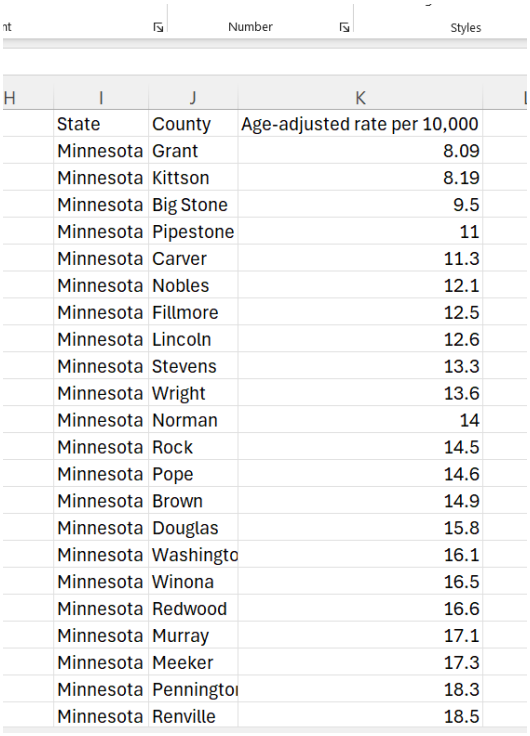


	A	B	C	D	E	F	G
1	__Outcome	__Year	_County	Age-adjust	Note	Count of cases	
2	ED visits	2019-2021	Grant	8.09	Unstable r	17	
3	ED visits	2019-2021	Kittson	8.19	Unstable r	9	
4	ED visits	2019-2021	Big Stone	9.5	Unstable r	12	
5	ED visits	2019-2021	Pipestone	11		27	
6	ED visits	2019-2021	Carver	11.3		337	
7	ED visits	2019-2021	Nobles	12.1		74	
8	ED visits	2019-2021	Fillmore	12.5		72	
9	ED visits	2019-2021	Lincoln	12.6	Unstable r	21	
10	ED visits	2019-2021	Stevens	13.3		37	
11	ED visits	2019-2021	Wright	13.6		541	
12	ED visits	2019-2021	Norman	14		25	
13	ED visits	2019-2021	Rock	14.5		38	
14	ED visits	2019-2021	Pope	14.6		44	
15	ED visits	2019-2021	Brown	14.9		96	
16	ED visits	2019-2021	Douglas	15.8		161	
17	ED visits	2019-2021	Washingto	16.1		1196	
18	ED visits	2019-2021	Winona	16.5		222	
19	ED visits	2019-2021	Redwood	16.6		67	
20	ED visits	2019-2021	Murray	17.1		36	
21	ED visits	2019-2021	Meeker	17.3		110	
22	ED visits	2019-2021	Penningtor	18.3		73	
23	ED visits	2019-2021	Renville	18.5		68	

line chart | bar chart | map

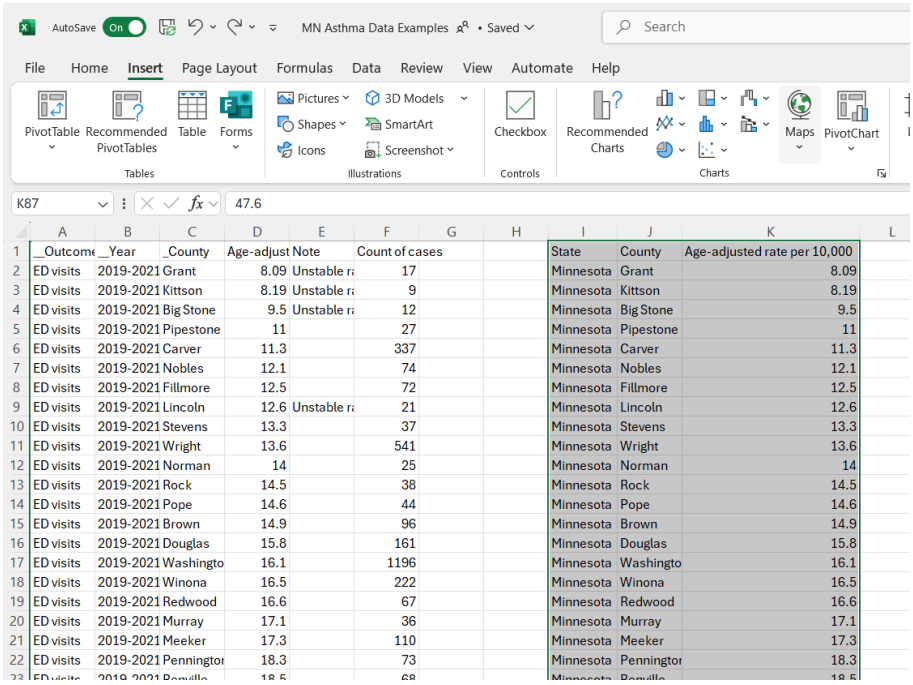
The mapping function on excel will not read the data correctly in this format, so we must create a new table with the data.

When using the mapping function, you must include a “state” column, so Excel knows what to match the county names with. Here is what the new table will look like.



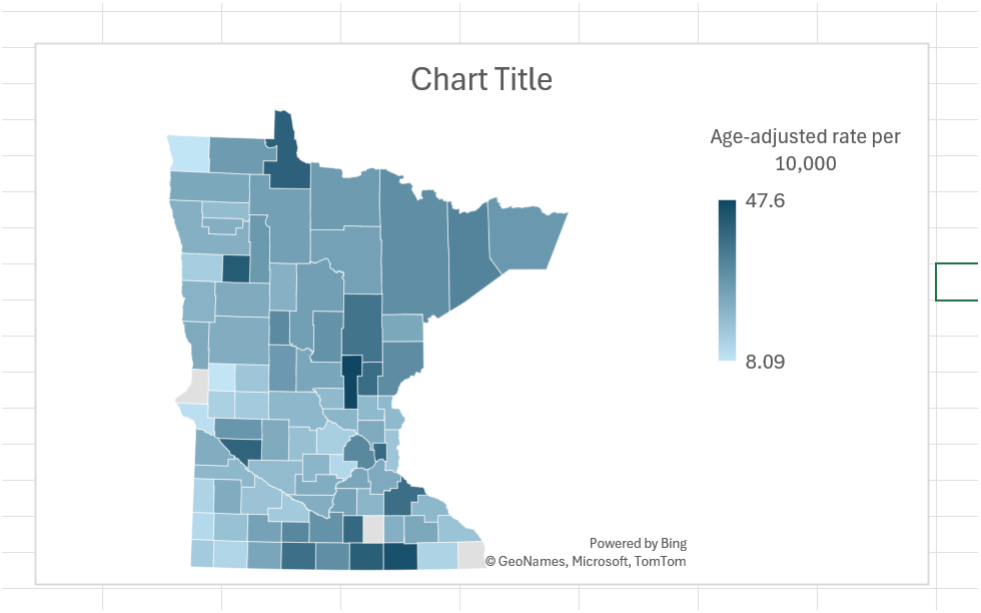
State	County	Age-adjusted rate per 10,000
Minnesota	Grant	8.09
Minnesota	Kittson	8.19
Minnesota	Big Stone	9.5
Minnesota	Pipestone	11
Minnesota	Carver	11.3
Minnesota	Nobles	12.1
Minnesota	Fillmore	12.5
Minnesota	Lincoln	12.6
Minnesota	Stevens	13.3
Minnesota	Wright	13.6
Minnesota	Norman	14
Minnesota	Rock	14.5
Minnesota	Pope	14.6
Minnesota	Brown	14.9
Minnesota	Douglas	15.8
Minnesota	Washingto	16.1
Minnesota	Winona	16.5
Minnesota	Redwood	16.6
Minnesota	Murray	17.1
Minnesota	Meeker	17.3
Minnesota	Pennington	18.3
Minnesota	Renville	18.5

Now we can highlight this new table, go to the insert tab, and then click on the “Maps” button.



	A	B	C	D	E	F	G	H	I	J	K	L
1	__Outcome	__Year	_County	Age-adjust	Note	Count of cases			State	County	Age-adjusted rate per 10,000	
2	ED visits	2019-2021	Grant	8.09	Unstable ra	17			Minnesota	Grant	8.09	
3	ED visits	2019-2021	Kittson	8.19	Unstable ra	9			Minnesota	Kittson	8.19	
4	ED visits	2019-2021	Big Stone	9.5	Unstable ra	12			Minnesota	Big Stone	9.5	
5	ED visits	2019-2021	Pipestone	11		27			Minnesota	Pipestone	11	
6	ED visits	2019-2021	Carver	11.3		337			Minnesota	Carver	11.3	
7	ED visits	2019-2021	Nobles	12.1		74			Minnesota	Nobles	12.1	
8	ED visits	2019-2021	Fillmore	12.5		72			Minnesota	Fillmore	12.5	
9	ED visits	2019-2021	Lincoln	12.6	Unstable ra	21			Minnesota	Lincoln	12.6	
10	ED visits	2019-2021	Stevens	13.3		37			Minnesota	Stevens	13.3	
11	ED visits	2019-2021	Wright	13.6		541			Minnesota	Wright	13.6	
12	ED visits	2019-2021	Norman	14		25			Minnesota	Norman	14	
13	ED visits	2019-2021	Rock	14.5		38			Minnesota	Rock	14.5	
14	ED visits	2019-2021	Pope	14.6		44			Minnesota	Pope	14.6	
15	ED visits	2019-2021	Brown	14.9		96			Minnesota	Brown	14.9	
16	ED visits	2019-2021	Douglas	15.8		161			Minnesota	Douglas	15.8	
17	ED visits	2019-2021	Washingto	16.1		1196			Minnesota	Washingto	16.1	
18	ED visits	2019-2021	Winona	16.5		222			Minnesota	Winona	16.5	
19	ED visits	2019-2021	Redwood	16.6		67			Minnesota	Redwood	16.6	
20	ED visits	2019-2021	Murray	17.1		36			Minnesota	Murray	17.1	
21	ED visits	2019-2021	Meeker	17.3		110			Minnesota	Meeker	17.3	
22	ED visits	2019-2021	Pennington	18.3		73			Minnesota	Pennington	18.3	

Excel should then generate a map that looks like this.



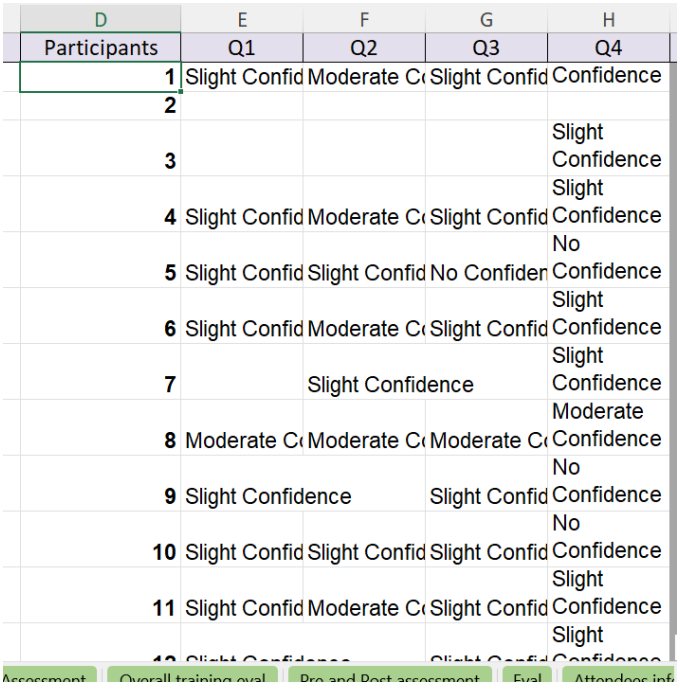
The Excel mapping function is very primitive and sometimes does not show much detail. For example, you can add data labels to the counties, but a lot of them cannot be read because of the small county spaces. Making the chart larger helps a little, but it does not look uniform. However, this mapping function can still be a useful tool depending on the situation.

Here is another example creating a stacked bar chart showing the percentage of responses across different categories using pre-assessment data from a previous Visualize This training. This example could be applicable to situations where you are collecting qualitative data and would like to visualize the responses.

We initially collected these qualitative responses using a Mentimeter survey and then downloaded an Excel document containing the results. For the results pertaining to the pre-assessment data, there were 4 different questions, and each question had 5 possible answers:

1. No Confidence
2. Slight Confidence
3. Moderate Confidence
4. High Confidence
5. No Answer

We had 25 total responses from Mentimeter. Here is what a possible table with this data could look like.



	D	E	F	G	H
	Participants	Q1	Q2	Q3	Q4
1		Slight Confid	Moderate C	Slight Confid	Confidence
2					
3					Slight Confidence
4		Slight Confid	Moderate C	Slight Confid	Slight Confidence
5		Slight Confid	Slight Confid	No Confiden	No Confidence
6		Slight Confid	Moderate C	Slight Confid	Slight Confidence
7			Slight Confidence		Slight Confidence
8		Moderate C	Moderate C	Moderate C	Moderate Confidence
9		Slight Confidence		Slight Confid	No Confidence
10		Slight Confid	Slight Confid	Slight Confid	No Confidence
11		Slight Confid	Moderate C	Slight Confid	Slight Confidence
					Slight

We need to create a variable code for the qualitative data to turn it into a quantitative format because numerical data is easier to filter and validate using Excel's tools. Additionally, it is important to remember that Excel does not read 0's, so we cannot use 0 for the blank spaces in the chart above. Those blank spaces represent a non-answer.

Here is how we have this data coded.

High Confidence	4
Moderate Confidence	3
Slight Confidence	2
No Confidence	1
No Answer	5

And here is what the table looks like after we use the code to fill in the corresponding numbers.

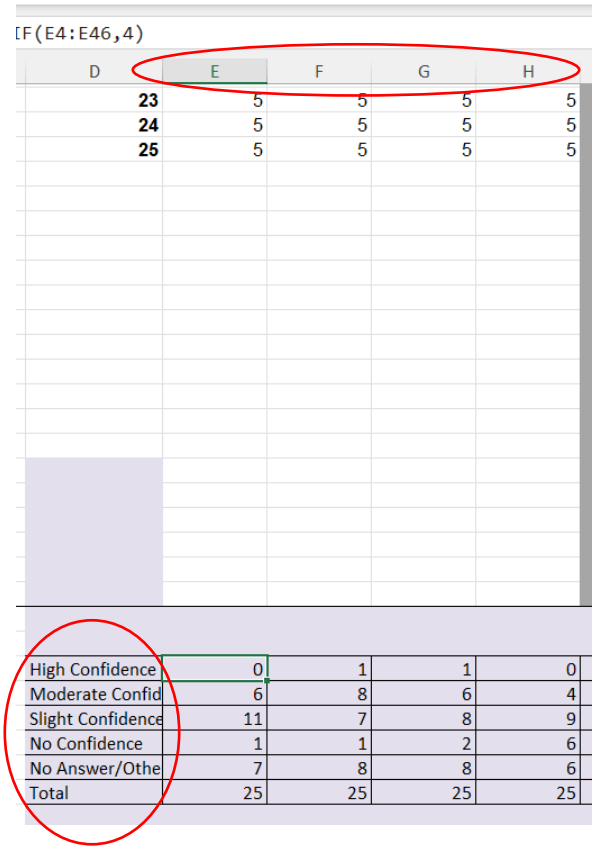
Pre-Assessment Results UN

Participants	Q1	Q2	Q3	Q4
1	2	3	2	2
2	5	5	5	5
3	5	5	5	2
4	2	3	2	2
5	2	2	1	1
6	2	3	2	2
7	5	2	5	2
8	3	3	3	3
9	2	5	2	1
10	2	2	2	1
11	2	3	2	2
12	2	5	2	2
13	3	4	3	3
14	2	2	1	5
15	3	3	3	2
16	2	2	2	2
17	2	2	3	1
18	5	5	5	5
19	3	3	3	3
20	3	3	5	3

sessment | Overall training eval | Pre and Post assessment | Eval | Attendees inf

Next, we need to count how many of each answer (number) there is under each question and then calculate the percentage of each answer. We can do this easily by using numerous functions in Excel.

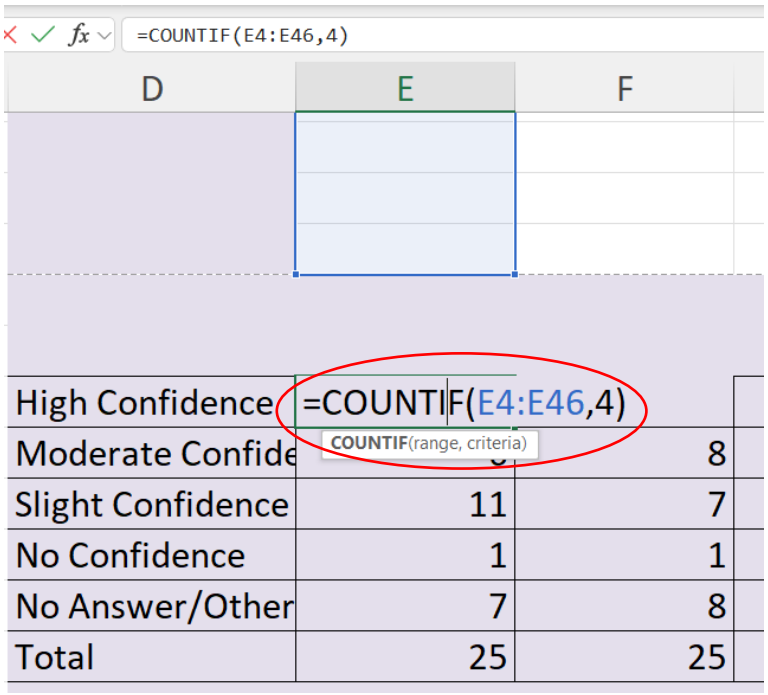
Excel functions are easier to work with if the data and corresponding analysis is in the same column. For this example, we have 4 columns (E, F, G and H), which correspond to the 4 pre-assessment questions. We need to set up a table with the row headings (the different confidence levels) so we can keep track of how many responses we had in each confidence level.



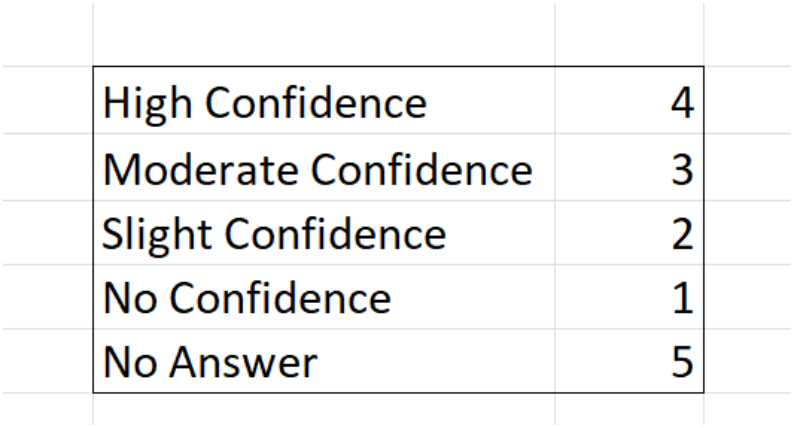
	D	E	F	G	H
	23	5	5	5	5
	24	5	5	5	5
	25	5	5	5	5
High Confidence		0	1	1	0
Moderate Confid		6	8	6	4
Slight Confidence		11	7	8	9
No Confidence		1	1	2	6
No Answer/Othe		7	8	8	6
Total		25	25	25	25

Next, we need to use the code for the confidence levels and use the countif function in Excel to count how many responses are in each category. We will start with column E, which would be the first question. Click on the cell in column E that corresponds with the "high confidence" response, and type "=countif." You should be able to select the function, and then it will prompt you to highlight the data in column E. Now we need to add the criteria of what number you want to be counted in the highlighted data, in this case "high confidence" corresponds with the number 4 (this number comes from our code that we made above).

Here is what the function should look like when done.

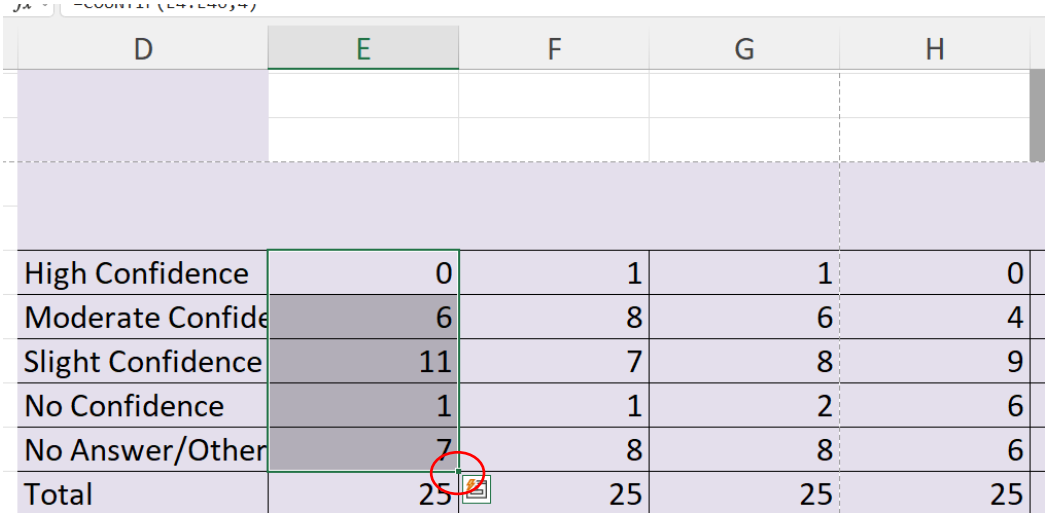


Repeat this process for the rest of the column. The range will be the same if it is in the same column, and the number after the comma will correspond with the code we made earlier.



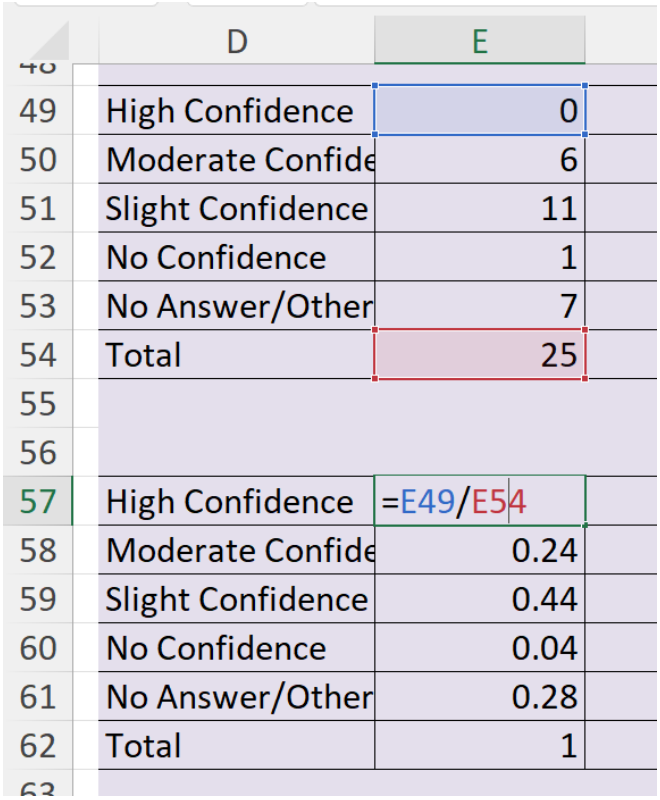
To get the total, you can use the “=sum” function and then highlight the data you want to calculate the total for.

Once you have 1 column done, we can use a shortcut method to fill in columns F, G, and H. For the shortcut, highlight the cells where we just used the “countif” and “sum” functions and in the bottom right corner of the highlighted data there should be a little box. When you hover your mouse over the box, your curser will turn into a plus symbol. When the plus symbol is active drag your cursor over to column H, to fill in the remaining columns. The variable coding should remain the same in each function, and the only ting that will change is the column range. You should see the numbers automatically populate the rest of the cells in the table, and the total should be the same for all 4 columns. In this example, this step was already completed.



D	E	F	G	H
High Confidence	0	1	1	0
Moderate Confide	6	8	6	4
Slight Confidence	11	7	8	9
No Confidence	1	1	2	6
No Answer/Other	7	8	8	6
Total	25	25	25	25

Next, we need to calculate the percentage of each response for each of the questions question. This can be done by taking the number of a response and dividing it by the total, as shown below. After the first column is calculated, you can use the shortcut method from the previous step to fill in the rest of the columns.



	D	E
49	High Confidence	0
50	Moderate Confide	6
51	Slight Confidence	11
52	No Confidence	1
53	No Answer/Other	7
54	Total	25
55		
56		
57	High Confidence	=E49/E54
58	Moderate Confide	0.24
59	Slight Confidence	0.44
60	No Confidence	0.04
61	No Answer/Other	0.28
62	Total	1

Next, we need to create a new table with this data so we can create the stacked bar chart. Copy and paste the data into a table formatted like the one below. This step is important because we need the data to match up with the questions.

Next, put the decimals into percentage format. This can be done by highlighting the data and then clicking the percentage format button on the home button. The table looks like this when these steps are completed.

	PRE-ASSESSMENT unmatched					
I am able to...	High Confidence	Moderate Confidence	Slight Confidence	No Confidence	No Response	n=
I am able to develop a clear and memorable message from my data.	0%	24%	44%	4%	28%	25
I am able to choose the appropriate chart type to display my data.	4%	32%	28%	4%	32%	25
I am able to identify audience characteristics that influence communication.	4%	24%	32%	8%	32%	25
I am able to effectively format critical components of a data visualization.	0%	16%	36%	24%	24%	25

Now we can highlight the table (excluding the total column) and insert the bar chart. After formatting the chart, the final version looks like this.