

Antimicrobial-Specific Average Length of Therapy

Description: These instructions will demonstrate how to calculate average length of therapy for a particular antimicrobial. These instructions will build on the information contained in this [Quick Reference Guide](#) for using the AU Line List and **Antimicrobial-Specific Days of Therapy (DOT) per 1000 Days Present**, but will provide different instructions for manipulating the data. These instructions will be based on using the report titled “Line Listing – All Submitted AU Data for FACWIDEIN”.

Determining average length of therapy for a specific antimicrobial will be an estimate that incorporates data from NHSN as well as local data. The equation ultimately used will look like this:

$$\frac{\text{Days of Therapy of Specific Antimicrobial}}{\text{Number of Admissions that Received Specific Antimicrobial}}$$

BEFORE YOU GET STARTED: Calculating average length of therapy will require acquiring your own data (i.e., NOT from NSHN) regarding number of admissions per month receiving the antimicrobial of interest. This can be done by working with your local data and/or informatics analyst, if available.

For this example, you will be determining the average length of therapy of cefepime for the Step Down unit. You would like the data on a monthly basis for all of calendar year 2021.

Manipulating the Data

- Part of the data needed to calculate average length of therapy can be obtained through NHSN. Follow the steps in the [Quick Reference Guide for Antimicrobial-Specific DOTs per 1000 Days Present](#) until you get your exported data into Excel. This exported data should look something like the following:

The screenshot shows an Excel spreadsheet with the following content:

File Home Insert Page Layout Formulas Data Review View Tell me what you want to do...

Clipboard Font Alignment Number Styles Cells

J10

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	National Healthcare Safety Network																
2																	
3	Line Listing - All Submitted AU Data for FACWIDEIN																
4																	
5	As of: A 2023 at 3:36 PM																
6																	
7	Date Range: SUMMARYAU summaryYM 2021M01 to 2021M12																
8																	
9	if (((location = ""STEP DOWN"") AND (drugIngredient = ""CEFEP"")))																
10																	
11	location=STEP DOWN																
12	summary\drugIngre	antimicro	numDaysf	IM_Count	IV_Count	location											
13	2021M01	CEFEP - Ce	140	1371	0	140	STEP DOWN										
14	2021M02	CEFEP - Ce	179	1354	0	179	STEP DOWN										
15	2021M03	CEFEP - Ce	140	1572	0	140	STEP DOWN										
16	2021M04	CEFEP - Ce	115	1331	0	115	STEP DOWN										
17	2021M05	CEFEP - Ce	147	1431	0	147	STEP DOWN										
18	2021M06	CEFEP - Ce	121	1228	0	121	STEP DOWN										
19	2021M07	CEFEP - Ce	131	1363	0	131	STEP DOWN										
20	2021M08	CEFEP - Ce	109	1509	0	109	STEP DOWN										
21	2021M09	CEFEP - Ce	127	1292	0	127	STEP DOWN										
22	2021M10	CEFEP - Ce	53	1283	0	53	STEP DOWN										
23	2021M11	CEFEP - Ce	118	1335	0	118	STEP DOWN										
24	2021M12	CEFEP - Ce	117	1366	0	117	STEP DOWN										
25																	
26	Any reported use of Colistin will be combined with and reported as Colistimethate. Any reported use of Amikacin Liposomal will be combined with and reported as Amikacin.																
27																	
28	Sorted by drugIngredientDesc orgID summaryYM																
29																	
30	Data conti. 2023 at 10:41 AM to include data beginning January 2019																

Sheet2 LineListing_AllSubmittedAUDatf

2. The other portion of data needed to calculate average length of therapy for a specific antimicrobial will be outside of what NHSN is able to provide. This includes the total number of admissions per month receiving the antimicrobial of interest. For the purpose of demonstration, these data have been incorporated into the Excel document mentioned in Step 1.
 - a. Of note, the number of admissions in this calculation is not the total number of admissions for each month; it is specifically the portion of those admissions that ultimately received at least one dose of the antimicrobial of interest.

Cefepime length of therapy spreadsheet.xlsx - Excel

File Home Insert Page Layout Formulas Data Review View Tell me what you want to do...

Clipboard Font Alignment Number Style

H12 Number of Admissions Receiving CEFEP

	A	B	C	D	E	F	G	H	I
1	National Healthcare Safety Network								
2									
3	Line Listing - All Submitted AU Data for FACWIDEIN								
4									
5	As of: A 2023 at 3:36 PM								
6									
7	Date Range: SUMMARYAU summaryYM 2021M01 to 2021M12								
8									
9	if (((location = ""STEP DOWN"") AND (drugIngredient = ""CEFEP"")))								
10									
11	location=STEP DOWN								
12	summary\	drugIngredientDesc	antimicro	numDaysF	IM_Count	IV_Count	location	Number of Admissions Receiving CEFEP	
13	2021M01	CEFEP - Cefepime	140	1371	0	140	STEP DOWN	14	
14	2021M02	CEFEP - Cefepime	179	1354	0	179	STEP DOWN	17	
15	2021M03	CEFEP - Cefepime	140	1572	0	140	STEP DOWN	12	
16	2021M04	CEFEP - Cefepime	115	1331	0	115	STEP DOWN	10	
17	2021M05	CEFEP - Cefepime	147	1431	0	147	STEP DOWN	11	
18	2021M06	CEFEP - Cefepime	121	1228	0	121	STEP DOWN	11	
19	2021M07	CEFEP - Cefepime	131	1363	0	131	STEP DOWN	11	
20	2021M08	CEFEP - Cefepime	109	1509	0	109	STEP DOWN	8	
21	2021M09	CEFEP - Cefepime	127	1292	0	127	STEP DOWN	8	
22	2021M10	CEFEP - Cefepime	53	1283	0	53	STEP DOWN	6	
23	2021M11	CEFEP - Cefepime	118	1335	0	118	STEP DOWN	14	
24	2021M12	CEFEP - Cefepime	117	1366	0	117	STEP DOWN	14	
25									

Non-NHSN data incorporated into exported NHSN Excel spreadsheet

- You will now need to start manipulating the data. Start by adding a new column header to indicate where you will be calculating average length of therapy; this is in Column I in this example.
- After creating this new header in Column I, you will want to enter an equation that allows Excel to calculate the average length of cefepime therapy for you. The equation will have the cefepime days of therapy (Column C) as the numerator and the number of admissions that received cefepime (Column H) as the denominator.
- To enter this equation into Excel, first select the cell immediately underneath the new header you created in Column I. In this cell type an equal sign "=" in order to start the equation. You may then either type or click the corresponding cell under Column C. Once this is done, enter a forward slash "/" and then either type or click the corresponding cell under Column H. The final equation should look like the screenshot below.

The screenshot shows an Excel spreadsheet with the following data table:

	A	B	C	D	E	F	G	H	I
1	National Healthcare Safety Network								
2									
3	Line Listing - All Submitted AU Data for FACWIDEIN								
4									
5	As of: A 2023 at 3:36 PM								
6									
7	Date Range: SUMMARYAU summaryYM 2021M01 to 2021M12								
8									
9	if (((location = ""STEP DOWN"") AND (drugIngredient = ""CEFEP"")))								
10									
11	location=STEP DOWN								
12	summary\	drugIngredientDesc	antimicrob	DaysFIM	Count	IV_Count	location	Number of Admissions Receiving CEFEP	AVG Length of Therapy
13	2021M01	CEFEP - Cefepime	140	1371	0	140	STEP DOWN	14	=C13/H13
14	2021M02	CEFEP - Cefepime	179	1354	0	179	STEP DOWN	17	
15	2021M03	CEFEP - Cefepime	140	1572	0	140	STEP DOWN	12	
16	2021M04	CEFEP - Cefepime	115	1331	0	115	STEP DOWN	10	
17	2021M05	CEFEP - Cefepime	147	1431	0	147	STEP DOWN	11	
18	2021M06	CEFEP - Cefepime	121	1228	0	121	STEP DOWN	11	
19	2021M07	CEFEP - Cefepime	131	1363	0	131	STEP DOWN	11	
20	2021M08	CEFEP - Cefepime	109	1509	0	109	STEP DOWN	8	
21	2021M09	CEFEP - Cefepime	127	1292	0	127	STEP DOWN	8	
22	2021M10	CEFEP - Cefepime	53	1283	0	53	STEP DOWN	6	
23	2021M11	CEFEP - Cefepime	118	1335	0	118	STEP DOWN	14	
24	2021M12	CEFEP - Cefepime	117	1366	0	117	STEP DOWN	14	

The formula bar for cell H13 shows the formula $=C13/H13$, which is circled in red. A red arrow labeled "Step 5" points to the formula bar, and another red arrow labeled "Step 3" points to the cell H13.

6. Once the equation is entered, hit the Enter key and the cefepime average length of therapy for the Step Down unit should be calculated. To repeat this for the remaining months, click, hold, and drag the bottom right corner of the cell containing the newly calculated average length of therapy to the last row of data; in this example, that is cell I24. Alternatively, you can double click the bottom right corner of the cell and it will repeat the calculation for the remaining rows. If you would like to round to the nearest tenth, use the "Decrease Decimal" button shown below.
 - a. TIP: If you need to round up to the nearest whole number, follow the instructions outlined in the **Quick Reference Guide for Antimicrobial-Specific DOTs per 1000 Days Present**.

The screenshot shows an Excel spreadsheet with the following data table:

summary	drugIngredientDesc	antimicro	numDays	IM_Count	IV_Count	location	Number of Admissions Receiving CEFEP	AVG Length of Therapy
2021M01	CEFEP - Cefepime	140	1371	0	140	STEP DOWN	14	10.0
2021M02	CEFEP - Cefepime	179	1354	0	179	STEP DOWN	17	10.5
2021M03	CEFEP - Cefepime	140	1572	0	140	STEP DOWN	12	11.7
2021M04	CEFEP - Cefepime	115	1331	0	115	STEP DOWN	10	11.5
2021M05	CEFEP - Cefepime	147	1431	0	147	STEP DOWN	11	13.4
2021M06	CEFEP - Cefepime	121	1228	0	121	STEP DOWN	11	11.0
2021M07	CEFEP - Cefepime	131	1363	0	131	STEP DOWN	11	11.9
2021M08	CEFEP - Cefepime	109	1509	0	109	STEP DOWN	8	13.6
2021M09	CEFEP - Cefepime	127	1292	0	127	STEP DOWN	8	15.9
2021M10	CEFEP - Cefepime	53	1283	0	53	STEP DOWN	6	8.8
2021M11	CEFEP - Cefepime	118	1335	0	118	STEP DOWN	14	8.4
2021M12	CEFEP - Cefepime	117	1366	0	117	STEP DOWN	14	8.4

Click & Drag

Data Visualization

- To begin work with visualizing these data, start by inserting a PivotChart. Simply place your cursor in any cell within your spreadsheet data and select Insert > PivotChart.

Example: Show monthly cefepime average length of therapy over span of one year

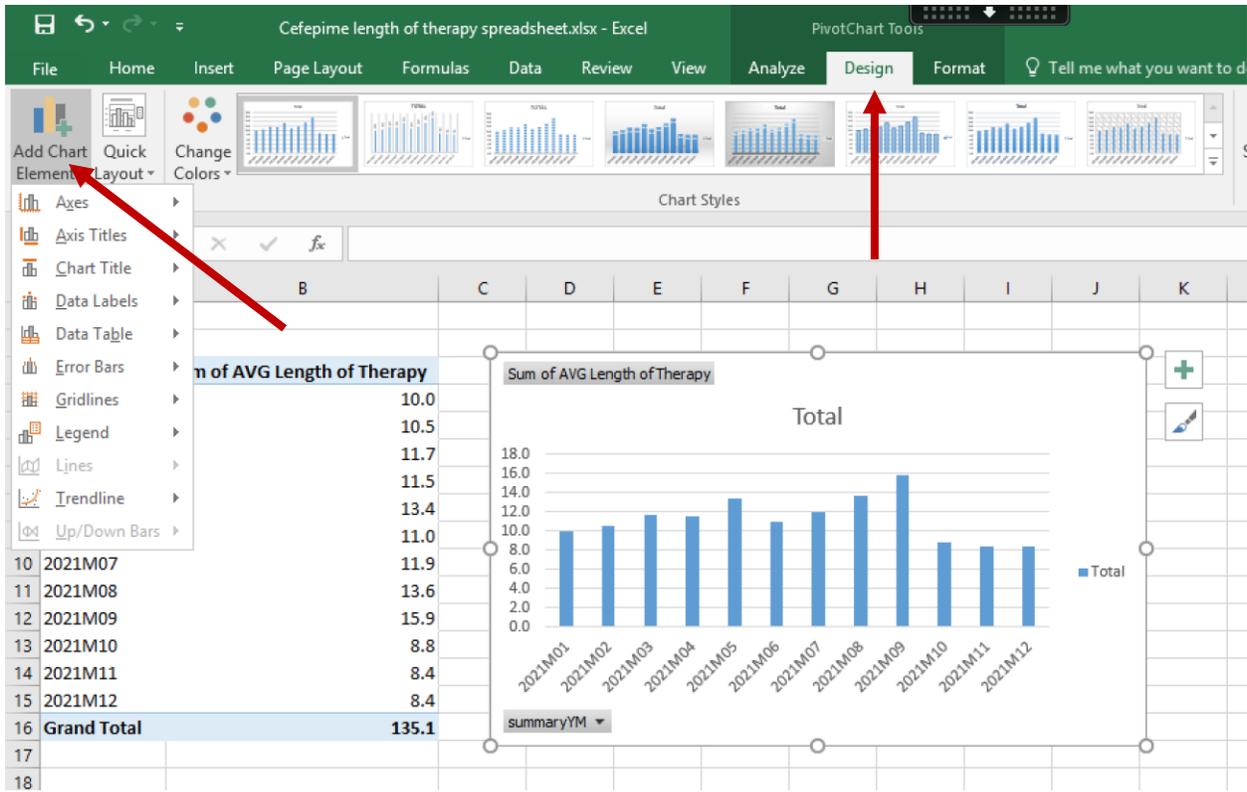
Using the PivotChart parameters highlighted below, a chart will be created in your new spreadsheet. To produce a bar graph from this chart, click any cell in the chart and then click Insert > Insert Column or Bar Chart > Clustered Bar Chart

The screenshot shows the Microsoft Excel interface with the following data in the PivotTable:

Row Labels	Sum of AVG Length of Therapy
2021M01	10.0
2021M02	10.5
2021M03	11.7
2021M04	11.5
2021M05	13.4
2021M06	11.0
2021M07	11.9
2021M08	13.6
2021M09	15.9
2021M10	8.8
2021M11	8.4
2021M12	8.4
Grand Total	135.1

The 'Insert' tab is active, and the 'Charts' group is expanded to show '2-D Column' charts. A red arrow points to the '2-D Column' chart icon, and another red arrow points to the '2-D Column' chart options in the dropdown menu.

The chart elements (e.g., X/Y axis titles, legend, etc.) may be updated to better reflect the data presented. This can be done by clicking on the new graph and then under “PivotChart Tools” > Design > Add Chart Element. Alternatively, you can select the green plus sign to the right of the graph and quickly add any chart elements missing.



A completed graph may look something like the following after adding data labels and updating the title & Y-axis. If you would rather see these data in a line chart format, simply right click the inside of the graph and select “Change Chart Type”. This will pull up a new window that will allow you to select a new graph format. This example is also covered in the [Quick Reference Guide for Antimicrobial-Specific DOTs per 1000 Days Present](#).

