

Antimicrobial-Specific Days of Therapy (DOT) per 1000 Days Present

Description: These instructions will demonstrate how to modify the Antimicrobial Use Line List Report to calculate antimicrobial-specific DOT per 1000 days present. These instructions will build on the information contained in this [Quick Reference Guide](#) for using the AU Line List, but will provide different instructions for modifying the report. These instructions will be based on using the report titled “Line Listing – All Submitted AU Data for FACWIDEIN”.

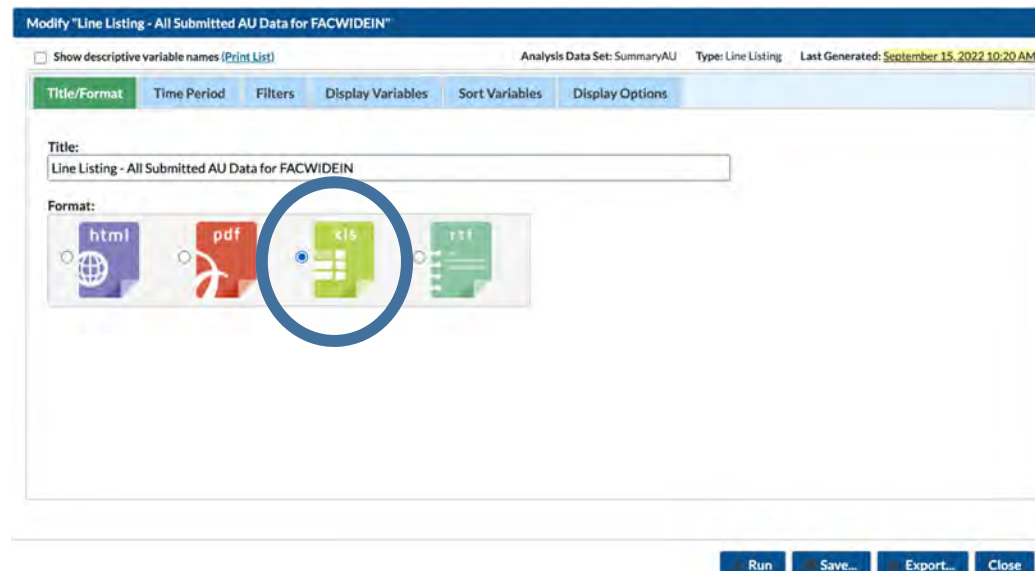
The equation ultimately used in this example should look like the following:

$$\frac{\text{Number of Antimicrobial Days}}{\text{Number of Days Present}} \times 1000$$

For this example, you will be determining the DOT of cefepime per 1000 days present for the Step Down unit. You would like the data on a monthly basis for all of calendar year 2021.

Modifying the Report

1. Since you will need to further modify the report after extracting the data from NHSN, select the xls file format on the first modification screen.



2. On the Time Period tab, select the date variable of summaryYM and enter the desired range of months:

Modify "Line Listing - All Submitted AU Data for FACWIDEIN"

Show descriptive variable names ([Print List](#)) Analysis Data Set: SummaryAU

Title/Format Time Period Filters Display Variables Sort Variables Display Options

Time Period:

| | | | |
|---------------|-----------|---------|-------------------|
| Date Variable | Beginning | Ending | Clear Time Period |
| summaryYM | 01/2021 | 12/2021 | |

Enter Date variable/Time period at the time you click the Run button

3. For this export, add location to the display variables tab. To do this, highlight the variable on the left side of the window and click the "selected >" button to move the variables to the right column.

Modify "Line Listing - All Submitted AU Data for FACWIDEIN"

Show descriptive variable names ([Print List](#)) Analysis Data Set: SummaryAU Type: Line Listing Last Generated: April 20, 2023 10:44 AM

Title/Format Time Period Filters Display Variables Sort Variables Display Options

Display Variables:

| | | | |
|----------------------|----------|---------------------|------|
| Available Variables: | | Selected Variables: | |
| category | All | category | Up |
| CCN | Selected | summaryYM | Down |
| class | Selected | drugIngredientDesc | |
| createDate | All | antimicrobialDays | |
| createUserID | | numDaysPresent | |
| drugDescription | | numAdmissions | Undo |
| drugIngredient | | im_Count | |
| location | | iv_Count | |
| locationType | | digestive_Count | |
| locCDC | | respiratory_Count | |
| locLabel | | | |
| modifiedDate | | | |
| modifyUserID | | | |
| OID | | | |
| orgLoc | | | |

Run Save... Export... Close

4. (Optional) There are a number of default variables that do not pertain to the DOT calculation. These variables can be removed in a similar fashion to step 3 by selecting the unwanted variables on the right side of the window and click the "< selected" button to move the variables to the left column.

Modify "Line Listing - All Submitted AU Data for FACWIDEIN"

Show descriptive variable names ([Print List](#)) Analysis Data Set: SummaryAU Type: Line Listing Last Generated: April 20, 2023 10:44 AM

Title/Format Time Period Filters **Display Variables** Sort Variables Display Options

Display Variables:

Available Variables:

- category
- CCN
- class
- createDate
- createUserID
- drugDescription
- drugIngredient
- locationType
- locCDC
- locLabel
- modifiedDate
- modifyUserID
- OID
- orgLoc
- RateDaysPresent

Selected Variables:

- orgID
- summary_TM
- drugIngredientDesc
- antimicrobialDays
- numDaysPresent
- numAdmissions
- im_Count
- iv_Count
- digestive_Count
- respiratory_Count
- location

Up Down Undo

Run Save... Export... Close

5. In order to pull data for a specific unit and antimicrobial, additional filters need to be applied. Under the Filters tab, change the current location filter to the unit of interest; for this example, we will be choosing the Step Down unit.

The screenshot displays the 'Modify Line Listing - All Submitted AU Data for FACWIDEIN' interface. At the top, there is a header with the title and a 'Show descriptive variable names (Print List)' checkbox. Below the header, there are several tabs: 'Title/Format', 'Time Period', 'Filters', 'Display Variables', 'Sort Variables', and 'Display Options'. The 'Filters' tab is selected, and a red arrow points to it. Under the 'Filters' tab, there are 'Additional Filters' buttons for 'Show' and 'Clear'. A filter rule is visible, showing a dropdown menu for 'location' set to 'equal' and a list of units. The 'STEP DOWN - STEP DOWN' unit is selected, and a red arrow points to it. The list of units includes: [INACTIVE] DMP 8E - DMP 8E, [INACTIVE] DMP 8W - DMP 8W, [INACTIVE] ED - ED, [INACTIVE] ER - ER, HEM/ONC - HEM/ONC, ICU - ICU, MED - MED, MED/SURG 1 - MED/SURG 1, MED/SURG 2 - MED/SURG 2, [INACTIVE] MICU - ADULT MICU, NICU - NICU, [INACTIVE] NURS - NURS, [INACTIVE] OBS - OBS, [INACTIVE] OBS1 - OBS1, PED ICU - PED ICU, PED MED/SU - PED MED/SURG, POSTPARTUM - POSTPARTUM, [INACTIVE] SICU - SICU, and STEP DOWN - STEP DOWN. At the bottom right, there are buttons for 'Run', 'Save...', 'Export...', and 'Close'. On the left side, there is a list of bar charts, including 'Bar Chart - Most Recent Month of AU Data by Antibact...', 'Bar Chart - All AU Data by Antibacterial Class and Locat...', 'Bar Chart - Most Recent Month of AU Data by Antifung...', 'Bar Chart - All AU Data by Antifungal Class and Locatior...', 'Bar Chart - Most Recent Month of AU Data by Anti-influ...', and 'Bar Chart - All AU Data by Anti-influenza Class and Loca...'. At the bottom left, there is a link for 'Targeted Assessment for Stewardship (TAS) Reports'.

6. In order to pull antimicrobial-specific data, a new filter will need to be added. This can be done by clicking the “Add rule” button. For this example, we want to set this rule to “drugingredient”.

The screenshot displays a software interface for modifying a line listing. At the top, a blue header reads "Modify 'Line Listing - All Submitted AU Data for FACWIDEIN'". Below this, a navigation bar includes tabs for "Title/Format", "Time Period", "Filters", "Display Variables", "Sort Variables", and "Display Options". The "Filters" tab is active, showing a section for "Additional Filters" with "Show" and "Clear" buttons. A filter rule is currently defined with "location" set to "equal" and "STEP DOWN - STEP DOWN". A red arrow points to the "Add rule" button. A dropdown menu is open, listing various variables, with "drugingredient" highlighted by another red arrow. At the bottom right, there are buttons for "Run", "Save...", "Export...", and "Close".

7. Once the new rule is set to “drugingredient”, a couple new boxes will appear. Leave the middle box as “equal” and change the final box to the antimicrobial of interest. In this example, we will be choosing cefepime.

The screenshot shows the 'Modify "Line Listing - All Submitted AU Data for FACWIDEIN"' interface. The 'Filters' tab is active. Under 'Additional Filters', there are two filter rules. The first rule has 'location' selected in the variable dropdown and 'equal' in the operator dropdown. The second rule has 'drugIngredient' selected in the variable dropdown and 'equal' in the operator dropdown. A dropdown menu is open for the second rule, showing a list of antimicrobials. 'CEFEP - Cefepime' is highlighted, and a red arrow points to it. Other antimicrobials in the list include AZITH - Azithromycin, AZT - Aztreonam, BALMAR - Baloxavir marboxil, CASPO - Caspofungin, CEFAC - Cefaclor, CEFAD - Cefadroxil, CEFAZ - Cefazolin, CEFDIN - Cefdinir, CEFDIT - Cefditoren, CEFID - Cefiderocol, CEFIX - Cefixime, CEFOT - Cefotaxime, CEFOTX - Cefotaxime, CEFPOX - Cefoxitin, CEFPO - Cefpodoxime, CEFPRO - Cefprozil, CEFPRO - Cefprozil, CEFTAR - Ceftaroline, CEFTAVI - Ceftazidime/Avibactam, and CEFTAZ - Ceftazidime. At the bottom right, there are buttons for 'Run', 'Save...', 'Export...', and 'Close'.

8. The last report modification we will want to make is under the “Display Options” tab. Change this variable to the “location” option.

The screenshot shows the 'Modify "Line Listing - All Submitted AU Data for FACWIDEIN"' interface. The 'Display Options' tab is active. Under 'Line Listing Options', the 'Page by variable' dropdown is set to 'summaryYM'. A dropdown menu is open, showing a list of variables: 'summaryYM', 'drugingredientDesc', 'antimicrobialDays', 'numDaysPresent', 'im_Count', 'iv_Count', and 'location'. The 'location' variable is highlighted, and a red arrow points to it. At the bottom right, there are buttons for 'Run', 'Save...', 'Export...', and 'Close'.

9. Run the query and an XLS file will download to your computer. (Tip: look in the downloads folder or the top/bottom banners of your browser)
10. Open the file in Excel™. To avoid losing data as you work, save the file to your computer and change the file type from CSV to an Excel document type of your choosing (e.g., “.xlsx”).

Manipulating Data in Excel

11. In the newly saved Excel document, you will now need to start manipulating the data. Start by adding a new column header to indicate where you will be calculating DOT; this is in Column H in this example.
12. After creating this new header in Column H, you will want to enter an equation that allows Excel to calculate the DOT per 1000 days present for you. The equation will have the antimicrobial days (Column C) as the numerator and the number of days present (Column D) as the denominator; the quotient of this equation will be multiplied by 1000 to standardize the value per 1000 days present.

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

| summaryYM | drugIngredientDesc | antimicrobialDays | numDaysPresent | IM_Count | IV_Count | location | DOT per 1000 days present |
|-----------|--------------------|-------------------|----------------|----------|----------|-----------|---------------------------|
| 2021M01 | CEFEP - Cefepime | 140 | 1371 | 0 | 140 | STEP DOWN | |
| 2021M02 | CEFEP - Cefepime | 179 | 1354 | 0 | 179 | STEP DOWN | |
| 2021M03 | CEFEP - Cefepime | 140 | 1572 | 0 | 140 | STEP DOWN | |
| 2021M04 | CEFEP - Cefepime | 115 | 1331 | 0 | 115 | STEP DOWN | |
| 2021M05 | CEFEP - Cefepime | 147 | 1431 | 0 | 147 | STEP DOWN | |
| 2021M06 | CEFEP - Cefepime | 121 | 1228 | 0 | 121 | STEP DOWN | |
| 2021M07 | CEFEP - Cefepime | 131 | 1363 | 0 | 131 | STEP DOWN | |
| 2021M08 | CEFEP - Cefepime | 109 | 1509 | 0 | 109 | STEP DOWN | |
| 2021M09 | CEFEP - Cefepime | 127 | 1292 | 0 | 127 | STEP DOWN | |
| 2021M10 | CEFEP - Cefepime | 53 | 1283 | 0 | 53 | STEP DOWN | |
| 2021M11 | CEFEP - Cefepime | 118 | 1335 | 0 | 118 | STEP DOWN | |
| 2021M12 | CEFEP - Cefepime | 117 | 1366 | 0 | 117 | STEP DOWN | |

A red arrow points to the cell in column H, row 12, which is labeled "Step 11".

13. To enter this equation into Excel, first select the cell immediately underneath the new header you created in Column H. In this cell type an equal sign & parenthesis “=(“ 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 D. Close the first part of this equation by entering a closing parenthesis “)”. Add an asterisk “*” to indicate multiplication, and enter the number 1000. The final equation should look like the screenshot below.

The screenshot shows the Microsoft Excel interface. The formula bar at the top displays the formula $= (C13/D13)*1000$, which is circled in red. Below the formula bar, a table of data is visible. A red box labeled "Step 13" has an arrow pointing to cell D13 in the table.

| summaryYM | drugIngredientDesc | antimicrobialDays | inDaysPresent | inCount_IV_Count | location | DOT per 1000 days present |
|-----------|--------------------|-------------------|---------------|------------------|---------------|---------------------------|
| 2021M01 | CEFEP - Cefepime | 140 | 1371 | 0 | 140 STEP DOWN | $= (C13/D13)*1000$ |
| 2021M02 | CEFEP - Cefepime | 179 | 1354 | 0 | 179 STEP DOWN | |
| 2021M03 | CEFEP - Cefepime | 140 | 1572 | 0 | 140 STEP DOWN | |
| 2021M04 | CEFEP - Cefepime | 115 | 1331 | 0 | 115 STEP DOWN | |
| 2021M05 | CEFEP - Cefepime | 147 | 1431 | 0 | 147 STEP DOWN | |
| 2021M06 | CEFEP - Cefepime | 121 | 1228 | 0 | 121 STEP DOWN | |
| 2021M07 | CEFEP - Cefepime | 131 | 1363 | 0 | 131 STEP DOWN | |
| 2021M08 | CEFEP - Cefepime | 109 | 1509 | 0 | 109 STEP DOWN | |
| 2021M09 | CEFEP - Cefepime | 127 | 1292 | 0 | 127 STEP DOWN | |
| 2021M10 | CEFEP - Cefepime | 53 | 1283 | 0 | 53 STEP DOWN | |
| 2021M11 | CEFEP - Cefepime | 118 | 1335 | 0 | 118 STEP DOWN | |
| 2021M12 | CEFEP - Cefepime | 117 | 1366 | 0 | 117 STEP DOWN | |

14. Once the equation is entered, hit the Enter key and the cefepime DOT per 1000 days present 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 DOT to the last row of data; in this example that is cell H24. Alternatively, you can double click the bottom right corner of the cell and it will repeat the calculation for the remaining rows.

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

| summaryYM | drugIngredientDesc | antimicrobialDays | numDaysPresent | IM_Count | IV_Count | location | DOT per 1000 days present |
|-----------|--------------------|-------------------|----------------|----------|----------|-----------|---------------------------|
| 2021M01 | CEFEP - Cefepime | 140 | 1371 | 0 | 140 | STEP DOWN | 102.115 |
| 2021M02 | CEFEP - Cefepime | 179 | 1354 | 0 | 179 | STEP DOWN | |
| 2021M03 | CEFEP - Cefepime | 140 | 1572 | 0 | 140 | STEP DOWN | |
| 2021M04 | CEFEP - Cefepime | 115 | 1331 | 0 | 115 | STEP DOWN | |
| 2021M05 | CEFEP - Cefepime | 147 | 1431 | 0 | 147 | STEP DOWN | |
| 2021M06 | CEFEP - Cefepime | 121 | 1228 | 0 | 121 | STEP DOWN | |
| 2021M07 | CEFEP - Cefepime | 131 | 1363 | 0 | 131 | STEP DOWN | |
| 2021M08 | CEFEP - Cefepime | 109 | 1509 | 0 | 109 | STEP DOWN | |
| 2021M09 | CEFEP - Cefepime | 127 | 1292 | 0 | 127 | STEP DOWN | |
| 2021M10 | CEFEP - Cefepime | 53 | 1283 | 0 | 53 | STEP DOWN | |
| 2021M11 | CEFEP - Cefepime | 118 | 1335 | 0 | 118 | STEP DOWN | |
| 2021M12 | CEFEP - Cefepime | 117 | 1366 | 0 | 117 | STEP DOWN | |

A red arrow points to cell H24 (the 'DOT per 1000 days present' column for 2021M12). A red-bordered box with the text 'Click & Drag' is positioned to the right of the arrow, indicating the action to be performed.

- In order to round up the DOT to a whole number, click the cell next to the first DOT calculation and then find the "ROUNDUP" equation under the Formulas tab (Formulas > Math & Trig > ROUNDUP). You may rename this column to Rounded DOT.

The screenshot shows the Microsoft Excel interface with the 'Formulas' tab selected. A dialog box for the 'ROUNDUP' function is open, displaying the formula result. The spreadsheet data is as follows:

| summaryYM | drugIngredientDesc | antimicrobialDays | numDaysPresent | IM_Count | IV_Count | location | DOT per 1000 days present |
|-----------|--------------------|-------------------|----------------|----------|----------|-----------|---------------------------|
| 2021M01 | CEFEP - Cefepime | 140 | 1371 | 0 | 140 | STEP DOWN | 102.115 UP() |
| 2021M02 | | 179 | 1354 | 0 | 179 | STEP DOWN | 132.201 |
| 2021M03 | | 140 | 1572 | 0 | 140 | STEP DOWN | 89.059 |
| 2021M04 | | 115 | 1331 | 0 | 115 | STEP DOWN | 86.401 |
| 2021M05 | | 147 | 1431 | 0 | 147 | STEP DOWN | 102.725 |
| 2021M06 | | 121 | 1228 | 0 | 121 | STEP DOWN | 98.534 |
| 2021M07 | | 131 | 1363 | 0 | 131 | STEP DOWN | 96.112 |
| 2021M08 | | 109 | 1509 | 0 | 109 | STEP DOWN | 72.233 |
| 2021M09 | | 127 | 1292 | 0 | 127 | STEP DOWN | 98.297 |
| 2021M10 | | 53 | 1283 | 0 | 53 | STEP DOWN | 41.309 |
| 2021M11 | | 118 | 1335 | 0 | 118 | STEP DOWN | 88.390 |
| 2021M12 | | 117 | 1366 | 0 | 117 | STEP DOWN | 85.652 |

16. In the new ROUNDUP function window that appears, type or click the cell of interest as the “Number”. In this case, it is cell H13. For the number of digits, enter the number “0” to indicate you want to round up to the nearest whole number. Once this is done hit “OK”. To apply this to the remainder of the rows, click, hold, and drag the bottom right corner of the cell to the last row of data; in this example, that is cell H24. Alternatively, you can double click the bottom right corner of the cell and it will repeat the calculation for the remaining rows.

- a. TIP: Steps 14-16 can be combined into one equation by stacking the formulas. The final equation in this example would be “=ROUNDUP(C13/D13*1000,0)”
- b. TIP: If there are excess zeros in your values, this can be adjusted by highlighting the values and clicking the “Decrease Decimal” button in Excel.

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

| location | STEP DOWN | drugingredientDesc | antimicrobialDays | numDaysPresent | IM_Count | IV_Count | location | DOT per 1000 days present | days present |
|----------|-----------|--------------------|-------------------|----------------|----------|----------|-----------|---------------------------|--------------|
| 2021M01 | | CEFEP - Cefepime | 140 | 1371 | 0 | 140 | STEP DOWN | 102.115 | 103 |
| 2021M02 | | CEFEP - Cefepime | 179 | 1354 | 0 | 179 | STEP DOWN | 132.201 | 133 |
| 2021M03 | | CEFEP - Cefepime | 140 | 1572 | 0 | 140 | STEP DOWN | 89.059 | 90 |
| 2021M04 | | CEFEP - Cefepime | 115 | 1331 | 0 | 115 | STEP DOWN | 86.401 | 87 |
| 2021M05 | | CEFEP - Cefepime | 147 | 1431 | 0 | 147 | STEP DOWN | 102.725 | 103 |
| 2021M06 | | CEFEP - Cefepime | 121 | 1228 | 0 | 121 | STEP DOWN | 98.534 | 99 |
| 2021M07 | | CEFEP - Cefepime | 131 | 1363 | 0 | 131 | STEP DOWN | 96.112 | 97 |
| 2021M08 | | CEFEP - Cefepime | 109 | 1509 | 0 | 109 | STEP DOWN | 72.233 | 73 |
| 2021M09 | | CEFEP - Cefepime | 127 | 1292 | 0 | 127 | STEP DOWN | 98.297 | 99 |
| 2021M10 | | CEFEP - Cefepime | 53 | 1283 | 0 | 53 | STEP DOWN | 41.309 | 42 |
| 2021M11 | | CEFEP - Cefepime | 118 | 1335 | 0 | 118 | STEP DOWN | 88.390 | 89 |
| 2021M12 | | CEFEP - Cefepime | 117 | 1366 | 0 | 117 | STEP DOWN | 85.652 | 86 |

The formula bar shows the formula: `=ROUNDUP(H13/H14,0)`. A red circle highlights the function name. A red arrow points to cell H13. A red box at the bottom right contains the text "Click & Drag".

Data Visualization

17. 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.

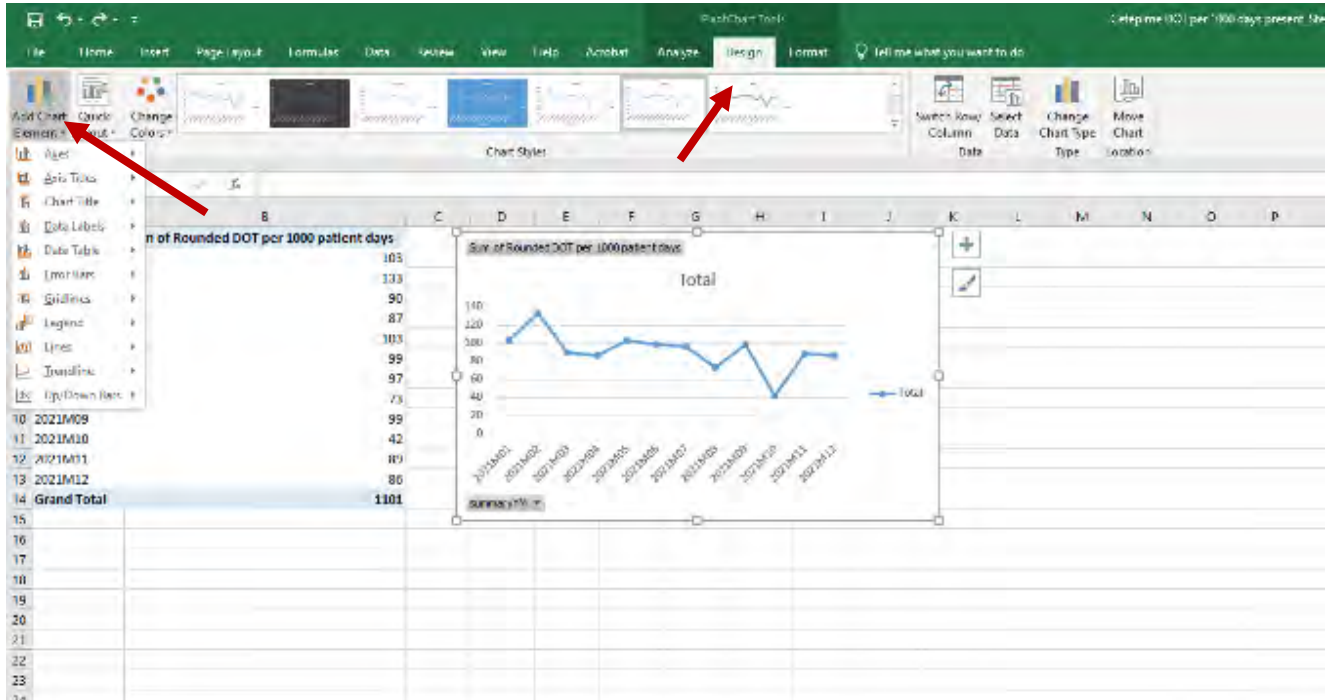
Example: Show monthly cefepime DOTs over span of one year

Using the PivotChart parameters highlighted below, a chart will be created in your new spreadsheet. To produce a line graph from this chart, click any cell in the chart and then click Insert > Insert Line or Area Chart > Line Chart with Markers

The screenshot displays the Microsoft Excel interface. The PivotTable is located in the range A1:B14. The PivotChart task pane is open, showing the '2-D Line' chart type selected. A red arrow points to the '2-D Line' section, and another red arrow points to the 'Line Chart with Markers' option.

| Row Labels | Sum of Rounded DOT per 1000 patient days |
|-------------|--|
| 2021M01 | 103 |
| 2021M02 | 133 |
| 2021M03 | 90 |
| 2021M04 | 87 |
| 2021M05 | 103 |
| 2021M06 | 99 |
| 2021M07 | 97 |
| 2021M08 | 73 |
| 2021M09 | 99 |
| 2021M10 | 42 |
| 2021M11 | 89 |
| 2021M12 | 86 |
| Grand Total | 1101 |

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. This type of graph could also be used to add a time point in the year when a particular intervention was implemented in order to demonstrate a potential impact on cefepime DOTs. Using the Insert > Shapes tool, this could be done with the addition of an arrow or solid line.

TIP: If you would rather see these data in a bar graph 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.

