Using Power Pivot and PivotTables to Report BFZ Metrics from Excel

Introduction

This method of creating deduplicated counts from the Built for Zero Reporting Suite available in Business Objects through Wellsky works with Microsoft Excel in most versions since 2013. It does not work in the Desktop Office Standard 2013 and 2016 version, though. To check the version of Desktop Excel you use, Click File, then click Account and you will see something like this in the top right of your display. More information on data modeling capabilities are available through Microsoft and there are many videos available on Youtube.
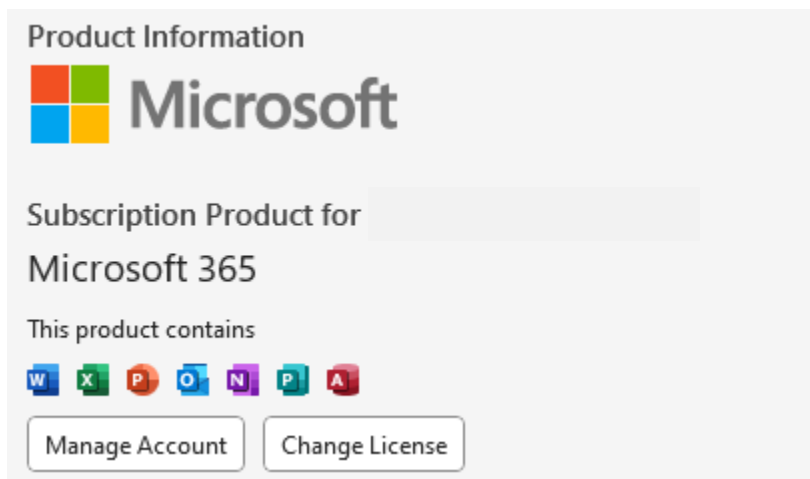

Figure 1 - Product information from Excel

Installing add-ins necessary to Use Power Pivot

You may need to install a couple of Add-ins to Excel to work with Power Pivot to automatically get deduplicated counts. Here are resources from Microsoft to help figure out which you will need. Use Power Pivot in Excel

For this instruction set, we will use the Built for Zero Case Conferencing Report v04.11, Built for Zero Inflow Report v04.11, and Built for Zero Outflow Report v04.11 for the fictitious community of Danville to report on all BfZ reporting metrics for Single Adults for April 2023, using the prompts in Figure 2and running the reports on the same day.

Report Prompt	Value Selected
Reporting Group	CS report(43);FY 22 PSH DQ(67);FY 22 RRH DQ(66)
Show Names	No
Client Location	All Locations
Enter effective date	05/01/2023
Beginning of Lookback Period	05/01/2021
Two Months Before Effective Date	03/01/2023
Four Months Before Effective Date	01/01/2023
Date and Time Report Run	05/17/2023 9:45 AM
User Running Report	danville_live:elockley
Refresh Status	Fully Refreshed

Figure 2 - Prompts for all reports run on the same day.

Preparing any Business Objects Table for Use in Excel

Business Objects file exports in Excel file format introduce some nonprinting characters that interfere with Excel's full functionality and will affect usability of this data for BFZ reporting. Strip these characters out and maintain full functionality in Excel by clearing the formats on the data set you're working with when you start to work with it. The reports in the BFZ reporting suite are optimized to facilitate working with them outside of Business Objects. This is put to best effect in the for viz versions of the tables because the simple aggregates and the titles are removed from the for Viz data sets. The instructions in this section are based on the Active Client Details for Viz tab in the Case Conferencing report which has the most complete set of information about each person on the Active List. The skills learned, here will transfer perfectly to Inflow and Outflow data sets, also. Repeating the skills on the New Client Details for Viz, Housed Returns Details for Viz, and Inactive Return Details for Viz from the Inflow report and Housed Clients Exiting, LOT to Housing for Viz, and Newly Inactive for Viz will complete all reporting metrics for Built for Zero with the exception of no longer meets population definition.

1. Select the entire range of the data table by clicking anywhere in the data range and pressing **Ctrl+A.** Find the Editing group (Figure 3) on the right side of the Home Tab of the ribbon.
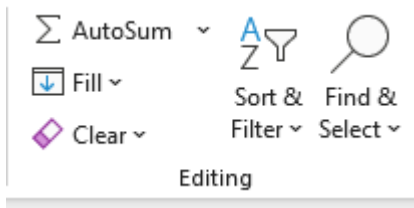

Figure 3 – Editing Group, Home Tab

2. Click the Down arrow on the **Clear button** and then select **Formats**. The change will be most obvious in Case Conferencing, because the color codes will all disappear, but all date formats will also revert to serialized date format (just a number) The table will looking like Figure 4 before the clearing of the formats:

LOT Approx to Exit/Current	Has CE Enrollment	Enrollment Outside CE	SO/TH/ES/SH Enrollment	PH Enrollment	Provider
454	Yes	No	No	No	Danville Coordinated Assessment(103)
431	Yes	No	No	No	Danville Coordinated Assessment(103)
1708	Yes	No	No	No	Danville Coordinated Assessment(103)

Figure 4 - Table section from Case Conferencing Active Client Details for Viz

After you clear the formats, it will be very plain, like Figure 5.

LOT Approx to Exit/Current	Has CE Enrollment	Enrollment Outside CE	SO/TH/ES/SH Enrollment	PH Enrollment	Provider
454	Yes	No	No	No	Danville Coordinated Assessment(103)
431	Yes	No	No	No	Danville Coordinated Assessment(103)
1708	Yes	No	No	No	Danville Coordinated Assessment(103)

Figure 5 - Same table with formats cleared.
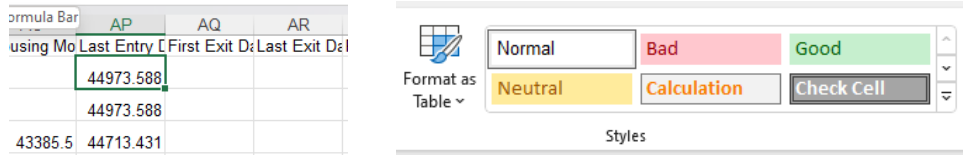
Creating an Excel Table

Figure 6 - Unformatted data and Styles group of Home Tab

3. Select any one cell (AP2 selected in Figure 6 for demonstration) with data in the table and then click **Format as Table** in the Styles group of the Home Tab (Figure 7) and choose any table style you like from the gallery. Using Excel Tables super charges your ability to work with data.
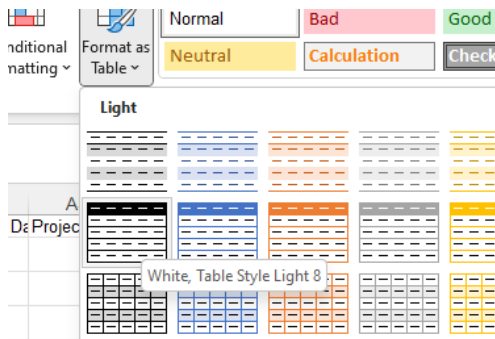

Figure 7 - Format as Table Gallery

4. Verify that Excel selected the correct range for the table in the Create Table dialogue box (Figure 8) and make sure that you select My table has headers.
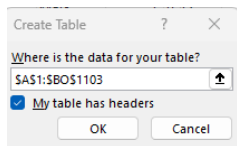
Figure 8 - Create Table Dialogue Box

5. The Table will reformat like Figure 9. Notice that there are filters on each column among many other features.

Figure 9 - Table format White, Table Style Light 8 applied to unformatted date columns

6. Select each of the date columns in the table by CTRL + clicking on the column header to select the entire column. Reformat them as dates. It should look like Figure 10. Notice that AP2 that we looked at in step 3 is still the selected cell.

Figure 10 - Date Columns reformatted as short date formats

Scroll down a bit and notice that the column header names from the report replace the Column letters in the headers once the selected cell is below what would allow the headers row to display on your display (Figure 11). Cells in an Excel Table still largely function as you would expect an Excel cell to behave, but there are a lot more features and it is much easier to keep up with Last Entry Date than column AP. The selected cell below is cell AP7 after we scrolled down far enough that the headers rolled off the display.

Figure 11 - Table Headers automatically replace column reference letters

Naming Tables, Adding them to Data Models and Creating a PivotTable

7. When working with many tables, it is helpful to name the tables something meaningful. Make sure a cell in the table is selected and click the Table Design tab on the ribbon. Find Table Name in the Properties Group (Figure 12). It will be on the far left. Select Table1 (or a different number if you have made other tables) and change it to Active. The naming rules permit no spaces and it must begin with a letter.
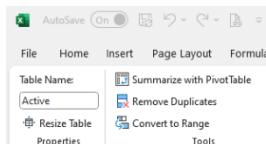

Figure 12 - Properties and Tools Groups of the Table Design Tab

8. Click Summarize with PivotTable in the Tools group.
9. Select Add this data to the Data Model in the PivotTable from table or range dialogue box and make sure the correct table name is in the Table/Range field. (Figure 13)Click OK.
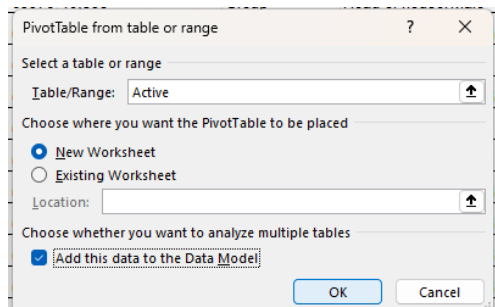

Figure 13 - Pivot Table from table or range dialogue box

Adding the data to the data model is critical to finding deduplicated counts in Excel, using data models also creates a lot more functionality beyond the needs in reporting BFZ data. If you do not have the option to Add this data to the Data Model, return to the Installing add-ins necessary to Use Power Pivot section and make sure you have the right add-ins enabled for your version of Excel and a version of Excel which supports Power Pivot.

10. A new worksheet named Sheet1 with a pivot table will be created to the left of the worksheet with your data table (Figure 14).
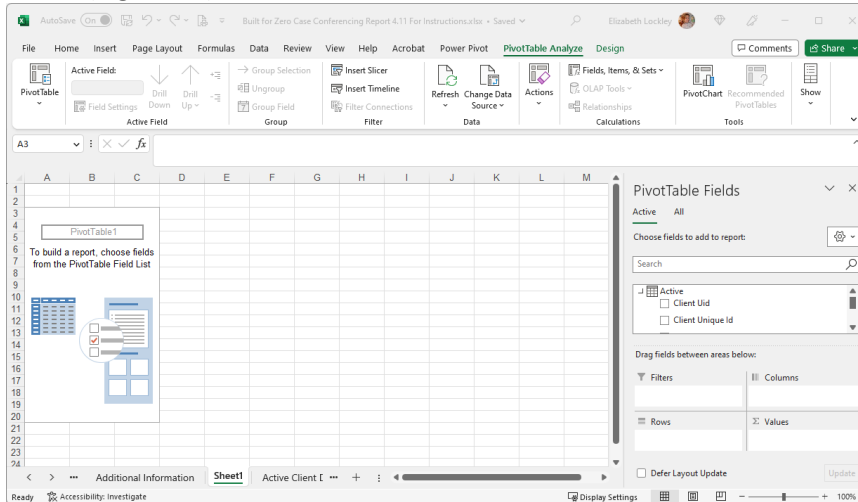

Figure 14 - New Pivot Table Created on Sheet1

Creating Measures to Count Households and Individuals

11. Go to the Power Pivot tab on the ribbon. Click the Measures Arrow in the Calculations Group and select New Measure (Figure 15).
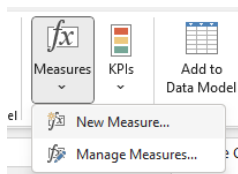

Figure 15 - Measures Button on the Calculations Group of the Power Pivot Tab

12. Complete the Measure dialogue box as in Figure 16. The function to get a deduplicated count is DistinctCount(). Start typing in the formula window =distinctcount. Excel will supply suggestions based on what you type. Select or type it out. Once the function is selected, Excel will suggest Columns to use in the count. You want Client Unique ID to get a correct deduplicated count of clients. Client Uid is searchable, but could potentially have multiple ID numbers for the same person.
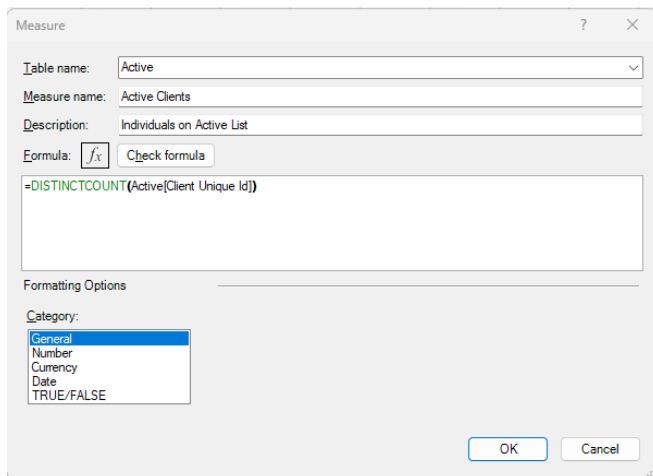

Figure 16 - Measure Dialogue Box

The correct formula is:

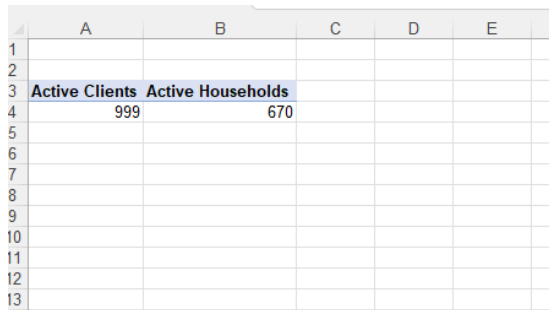=DISTINCTCOUNT(Active[Client Unique Id])

to count individuals on any list. *Distinctcount()* counts each unique value in a list. So no matter the number of occurrences in the list, it will count the same value only one time. In the formula, note that Active refers to the table name and [Client Unique Id] in square brackets is the name of the column. Make sure the Table name is the one you intend to evaluate. It can get a little confusing when you have multiple tables, which is why it's helpful to name the tables as you create them. Type Active Clients in the Measure name field and optionally fill in the Description box. Click OK.

13. The count automatically displays in the pivot table with a column Header of Active Clients – the name you gave the measure.
14. Repeat the process of creating a measure in Step 12 to make a measure called Active Households to count the number of households using the Household Identifier Column. Use Household Identifier, not Household Id.

The Household Id number is only available for clients who are part of a household. It is the number of the household in the Household management screen in Community Services. Household Identifier uses the Household Id number for households enrolled as part of a group but replaces the Client Unique Id for people with single enrollments, so people who may have been part of a household at one point, but are enrolled as a single, currently are counted correctly whether a household of one or part of household of several people. The formula will be:

=DISTINCTCOUNT(Active[Household Identifier])

You can check and modify the measures you have created at any point by clicking manage measures. Your PivotTable should look like Figure 17, now.

	A	B	C	D	E
1					
2					
3	**Active Clients**	**Active Households**			
4	999	670			
5					
6					
7					
8					
9					
10					
11					
12					
13					

Figure 17 - Pivot Table with Active Clients and Active Household Distinct (Deduplicated) Counts

15. Click the Field List Button in the Show group in the PivotTable Analyze tab If the PivotTable Fields Pane does not display similarly to Figure 18 on your display. The PivotTable Fields Pane layout may vary based on how you have Excel set up. Each column in the Active table displays as a possible option to subdivide your datasets for analysis.

16. Click in the search bar and start typing Chronic. That will limit the fields available to those with Chronic in the name. Drag the Chronic Field to Columns and place above ∑ Values.

17. Delete Chronic from the search bar and type Vet. Drag the Veteran Field to Rows and then drag ∑ Values above Veteran in rows, so the Drag fields between areas section of the PivotTable Fields pane and the PivotTable
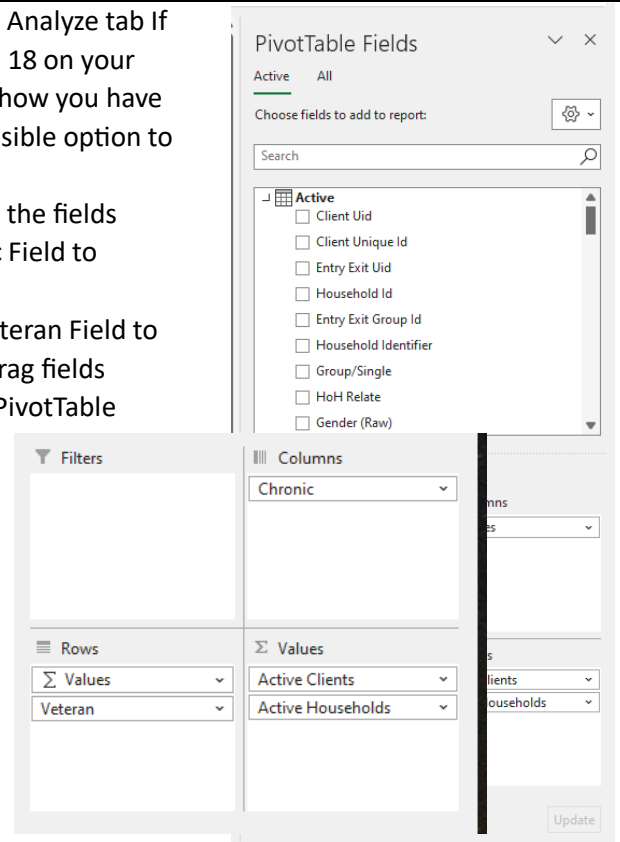

Figure 18 - PivotTable Fields Pane

Figure 19 - PivotTable with Chronic on Columns and Veterans on Rows and the Fields Area to set this up.

should look like Figure 19.

Customizing the Display by Adding Custom Columns in the Data Table

18. To combine all non-veteran responses into "Non-Veteran" and make Yes (HUD) responses "Veteran" go to the Active table on the Active Client Details for Viz tab and select a cell in the Veteran column. Right click and select Insert and then Table Columns to the left. The new column automatically gets a header of Column1. Go to the new column header cell and change it to Vet Simple. Select the row 2 cell in the Vet Simple column (BB2).

19. The Function Wizard helps compartmentalize complex function elements and supplies correct syntax. Using it is optional, but makes writing complex formulas much easier to get the syntax correct and to learn new functions. Click the Function Wizard button to the left of the formula bar. Type if in the Search for a function box, select IF and click OK.
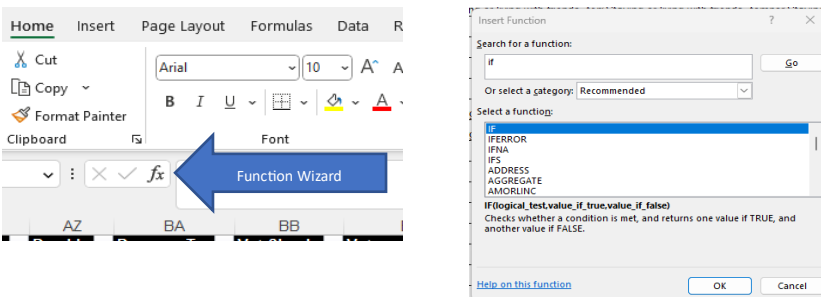

Figure 20 - Function Wizard Button and Insert Function dialogue box

20. Make sure that Logical_test is selected in the Function Arguments Wizard dialogue box and click in the Veteran column in the same row as your active cell in Vet Simple (BC2). The Logical_test box will populate with [@Veteran] which references the entire Veteran column rather than BC2. **Type ="Yes (HUD)"** with the quotation marks. This completes the beginning of the sentence If the selected cell equals "Yes (HUD) then make this cell "Veteran" if not, then make it "Non-Veteran". Type **Veteran** in the value_if_true field. Go to the Value_if_false field and notice that Excel adds the quotation marks around Veteran in the Value_if_true field. Type **Non-veteran** and click OK. Compare to Figure 21 The final formula in the column should be:
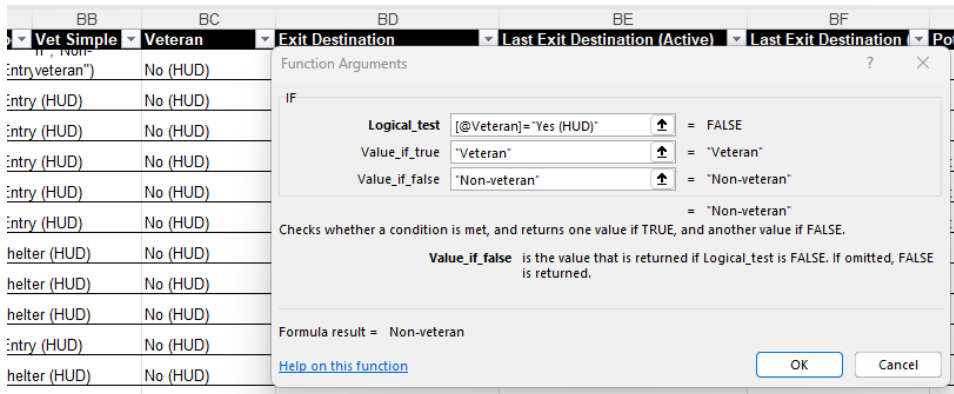

Figure 21 - Function Arguments Dialogue box for IF function

=IF([@Veteran]="Yes (HUD)","Veteran","Non-veteran")

The function wizard (Figure 21) displays each part of the formula as it goes together. Notice FALSE to the right of the Logical test, Then values to the rights of Value_if_true and Value_if_false and finally below those, ="Non-veteran" Displaying every part of the process of the If function.

If your formula uses RowColumn (BB3) references instead of column name [@Veteran] references, you probably shifted to a different row when you selected the cell in the veteran column. Tables automate creating the same formula in every row of the column and use, eliminating formula copy errors. The Vet Simple Column should populate completely through the entire table (Figure 22).

Figure 22 - Result of If function to group all Veteran responses into "Non Veteran" and "Veteran"

Refresh Pivot Table

21. If you add or change data to a Table and Data Model, as we did in the Vet Simple Column, you must refresh any pivot tables relying on the data, to use the new data in the PivotTable. Return to the PivotTable tab. Select a cell within the pivot table. Right Click and select Refresh (Figure 23). If you make changes to the data table, the PivotTable must be refreshed to include them.
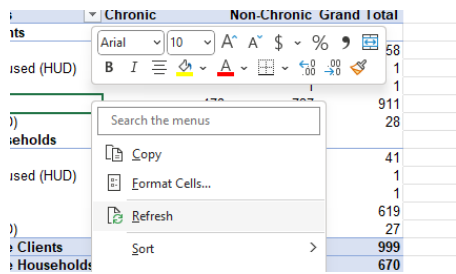

Figure 23 - Refresh Pivot Table

22. Drag Veteran off the Rows and Find Vet Simple in the list of Available fields and drag it to rows. The pivot table and field areas should look like Figure 24.
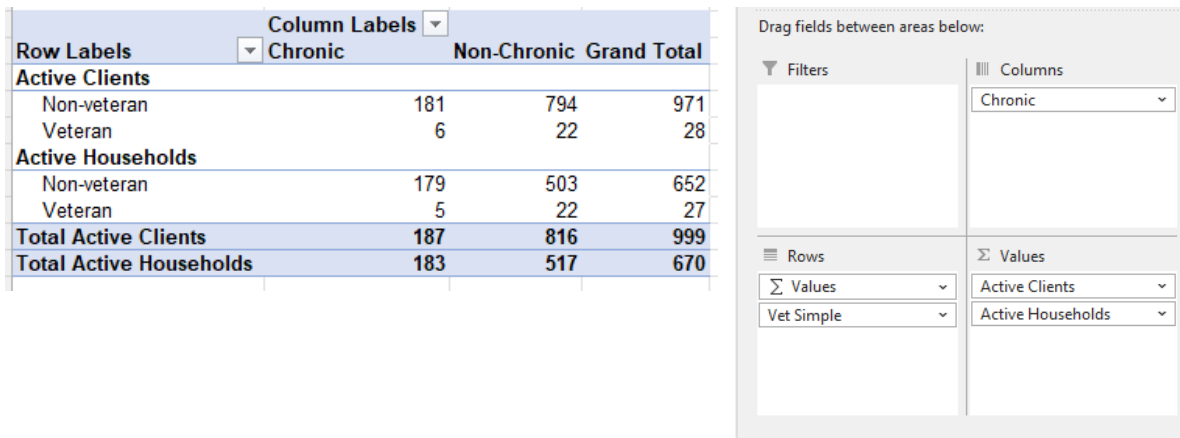

Figure 24 - Pivot Table and Field Area with Vet Simple instead of Veteran

Formatting a PivotTable

23. Click the Down arrow at the bottom right of the PivotTables Design Gallery on the Design Tab to expand it. Select a format that separates the data well (Figure 25).
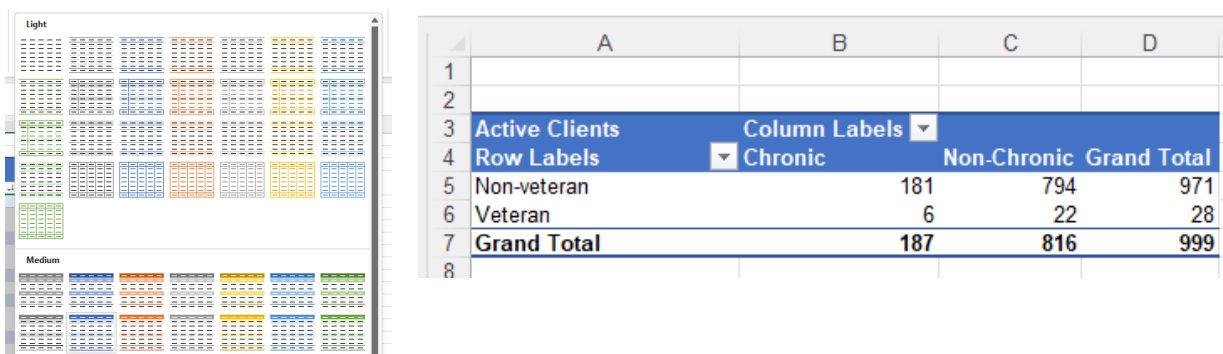

Figure 25 - PivotTable Style Gallery and PivotTable

Adding Household Type as an Additional Row

24. One method to sort individuals into their Built for Zero household types keeps all data visible and adds another layer of categories to rows. The trick with working with pivot tables is keeping them simple and using only a few categories to subdivide your calculations.

    Type BFZ in the Choose Fields to add to the report box on the PivotTable Fields Pane and drag BFZ Household Type to the top position of Rows. The Pivot Table and fields area will look like Figure 26.
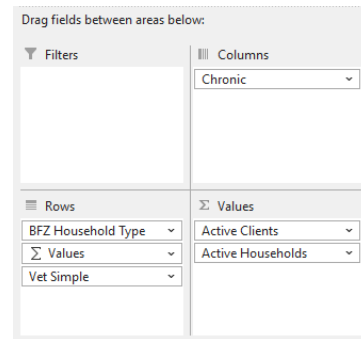

Figure 26 - PivotTable and Field Area with Household Type added to Rows

25. Working with PivotTables is about 10% art and 90% pure data science. Sometimes it will make more sense to move data elements around so everything makes sense and is easily interpreted. Move ∑ Values to Columns below Chronic and click Subtotals in the Layout group of the Design Tab. Select Show all Subtotals at top of group. The PivotTable and fields area will look like Figure 27.

| Row Labels	Chronic Active Clients	Active Households	Non-Chronic Active Clients	Active Households	Total Active Clients	Total Active Households
⊟ Families	20	19	352	117	371	117
Non-veteran	20	19	349	117	368	117
Veteran			3	3	3	3
⊟ No HoH or DOB Missing	3	2	31	19	34	21
Non-veteran	3	2	31	19	34	21
⊟ Other Household Type	1	1	33	14	34	14
Non-veteran	1	1	32	14	33	14
Veteran			1	1	1	1
⊟ Single Adults	158	156	384	345	539	491
Non-veteran	152	152	365	331	514	473
Veteran	6	5	19	18	25	23
⊟ Unaccompanied Minor			1	1	1	1
Non-veteran			1	1	1	1
⊟ Unaccompanied Youth	5	5	28	26	33	31
Non-veteran	5	5	28	26	33	31
Grand Total	187	183	816	517	999	670
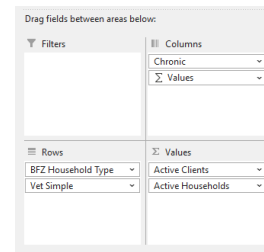
Figure 27 - PivotTable With Subtotals at Top and ∑Values on Columns

26. Drag the Active Households measure off of Values in the Fields Area. You can make a copy of the worksheet with the PivotTable and report on both Individuals and households if your community would like the data, but reporting only one measure on a complex table makes it simpler to understand.

    Click in cell A4 and replace Row Labels with **by Household Type, Chronic, and Veteran Status**. Resize the column and Wrap text in A4 so the text is visible. Select B3 and change the font color of Column Labels to the same as the background. You need to have something in the Column Labels and Row labels Cells, but in this case, Column Labels isn't necessary and would make more sense to fade into the background. The easiest way to do that is to change the font color - Figure 28.
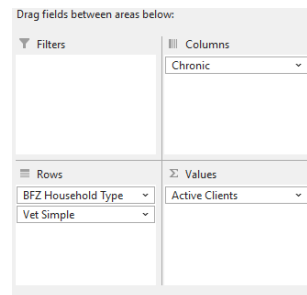

Figure 28 - Final Table with Household Count removed.

27. To sort household types by order of magnitude, Click the Down Arrow in A4 and select More Sort Options. Click the down arrow below Descending (Z to A) by: and select Active Clients - Figure 29.

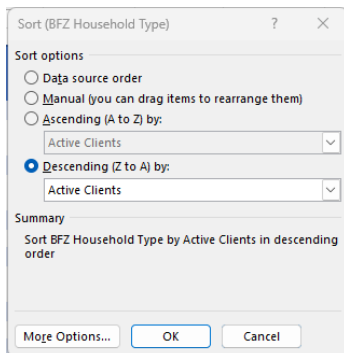*Figure 29 - Sort PivotTable by most common household type to least*

Researching Individuals from PivotTables

28. In most communities, Unaccompanied Minors and No HoH or DOB Missing is a data quality error. Double Click on any number value in a pivot table to create a new worksheet tab of the rows from the data table that makeup

Figure 30 - Underlying data for Unaccompanied Minor household types

that calculation. Double click the number 1 identifying an unaccompanied minor, and Sheet 2 will be created. Go to Sheet 2 and rename it Unaccompanied Minors. In the sample dataset pictured in Figure 30, Client 31365 is 2 years old and has multiple data quality issues and should be researched and corrected in the HMIS, backdating changes so they match the rest of their family.

29. Return to the PivotTable on Sheet 1 and rename the worksheet Active Clients Summary. You can double click any number values you immediately suspect of being data entry errors to get a list filtered to just that subset to send a simple list to the appropriate people to do data cleanup.

Changing Measures in the PivotTable

30. Scroll to the very bottom of the Available fields in the PivotTable Fields List. There will be a check mark in ∫x Active Clients, but no Checkmark in ∫x Active Households. Drag ∫x Active Households to the ∑ Values area and take the check mark out of ∫x Active from the field list. The pivot table is now calculated on the number of Households instead of the number of People. You can switch the measures back and forth as you like.

Adding Fields to use as Filters

31. You can add filters to a PivotTable to hide some data as an alternative to adding it to a row or column. In many cases, this is repetitive work when reporting on all data, but a useful case might be to find out more about populations in specific projects. Make a Copy of the Active Client Summary Tab and name it Active Client Summary Filter. Find Provider in the fields list and drag it to the Filter area. Click the Down arrow in B1 and select a provider/ Danville Coordinated Assessment (103). From the sample set, Figure 31 shows there are 878 people on the BNL enrolled in the Coordinated Entry while the original PivotTable shows there are 999 people active on the BNL, which could be a data entry problem or clients entering from a side door into housing programs or shelters.

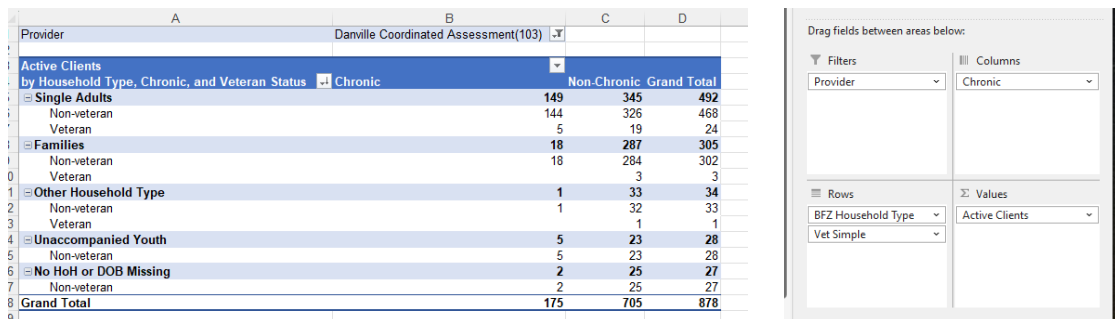| Active Clients by Household Type, Chronic, and Veteran Status	Chronic	Non-Chronic	Grand Total
Single Adults	149	345	492
Non-veteran	144	326	468
Veteran	5	19	24
Families	18	287	305
Non-veteran	18	284	302
Veteran		3	3
Other Household Type	1	33	34
Non-veteran	1	32	33
Veteran		1	1
Unaccompanied Youth	5	23	28
Non-veteran	5	23	28
No HoH or DOB Missing	2	25	27
Non-veteran	2	25	27
Grand Total	175	705	878

Figure 31 - Copy of PivotTable sheet With Provider added as filter and filtered to coordinated entry project.