Demo & Step by Step Guide

Analyzing SQL Server Data using PowerPivot in MS Excel

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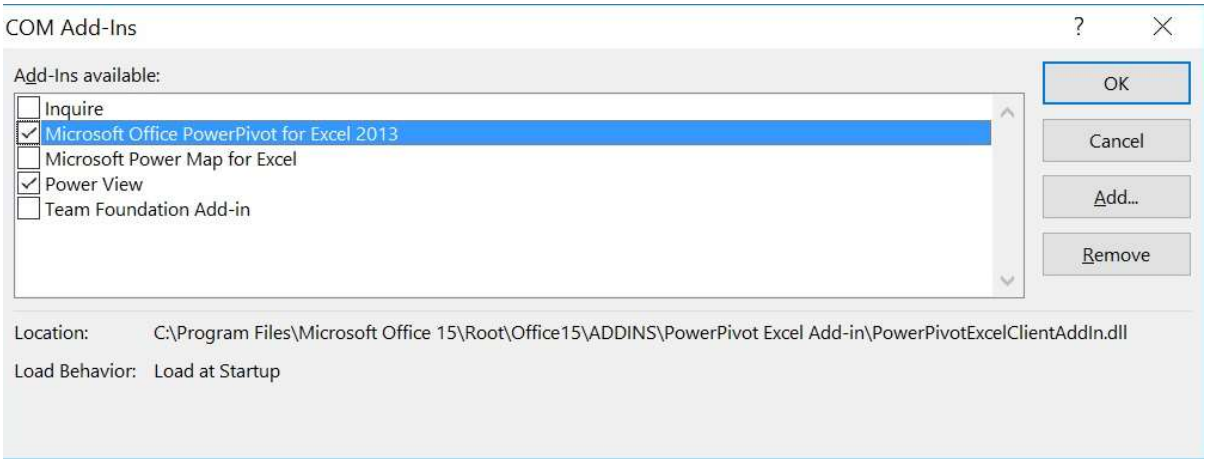
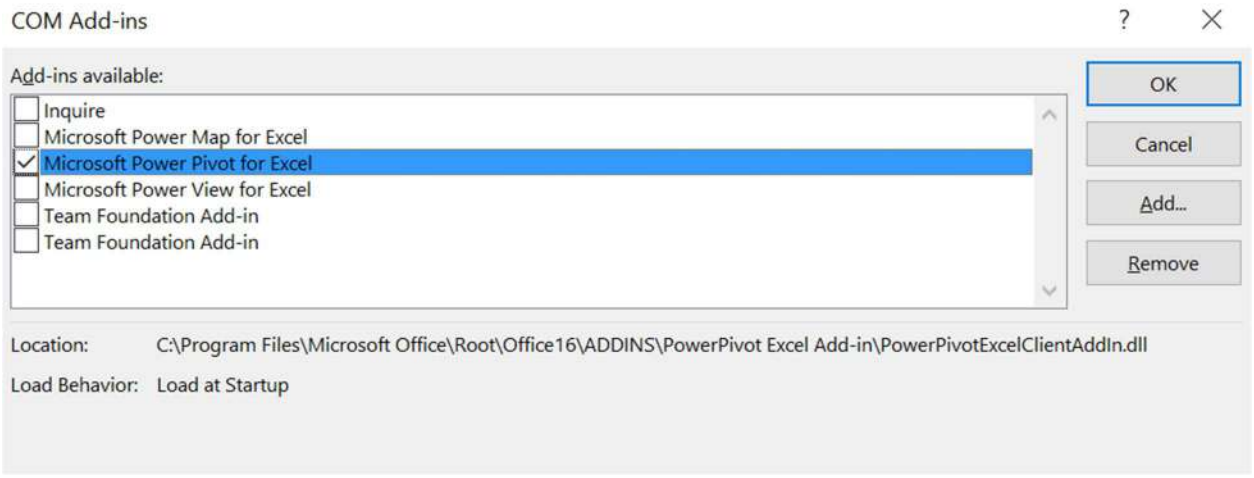
Activate Power Pivot MS Excel add-in

1. Open MS Excel 2013\2016
2. Go to **File** > **Options** > **Add-Ins**
3. In the Manage box, click **COM Add-ins**> Go
4. Check the **Microsoft Office Power Pivot** & **Power View** boxes



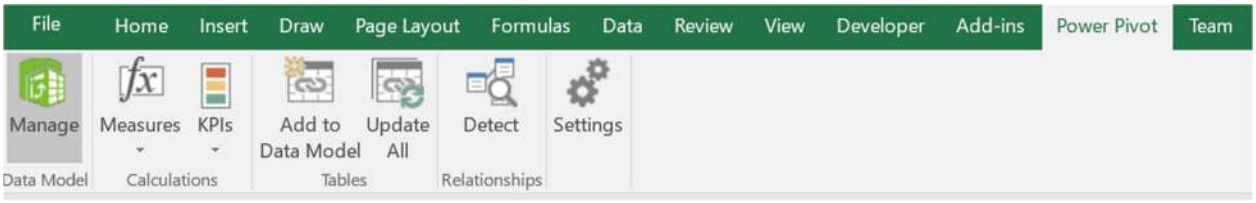
Excel 2013



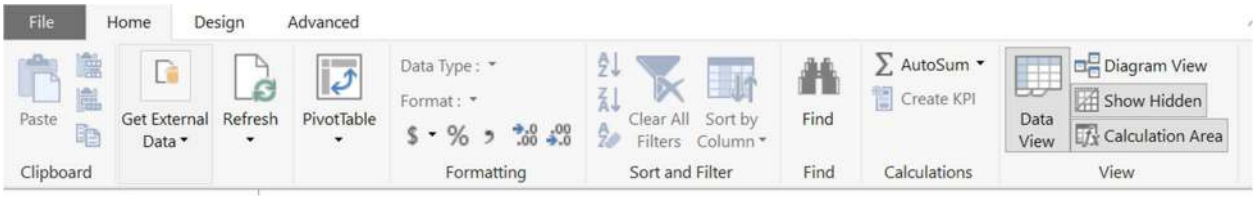
Excel 2016

Power Pivot tab

1. Click the **Power Pivot** tab
    a. This is the tab where you work with Power Pivot PivotTables, calculated fields, and key performance indicators (KPIs), and creating linked tables



2. Click **Manage** to open the Power Pivot window

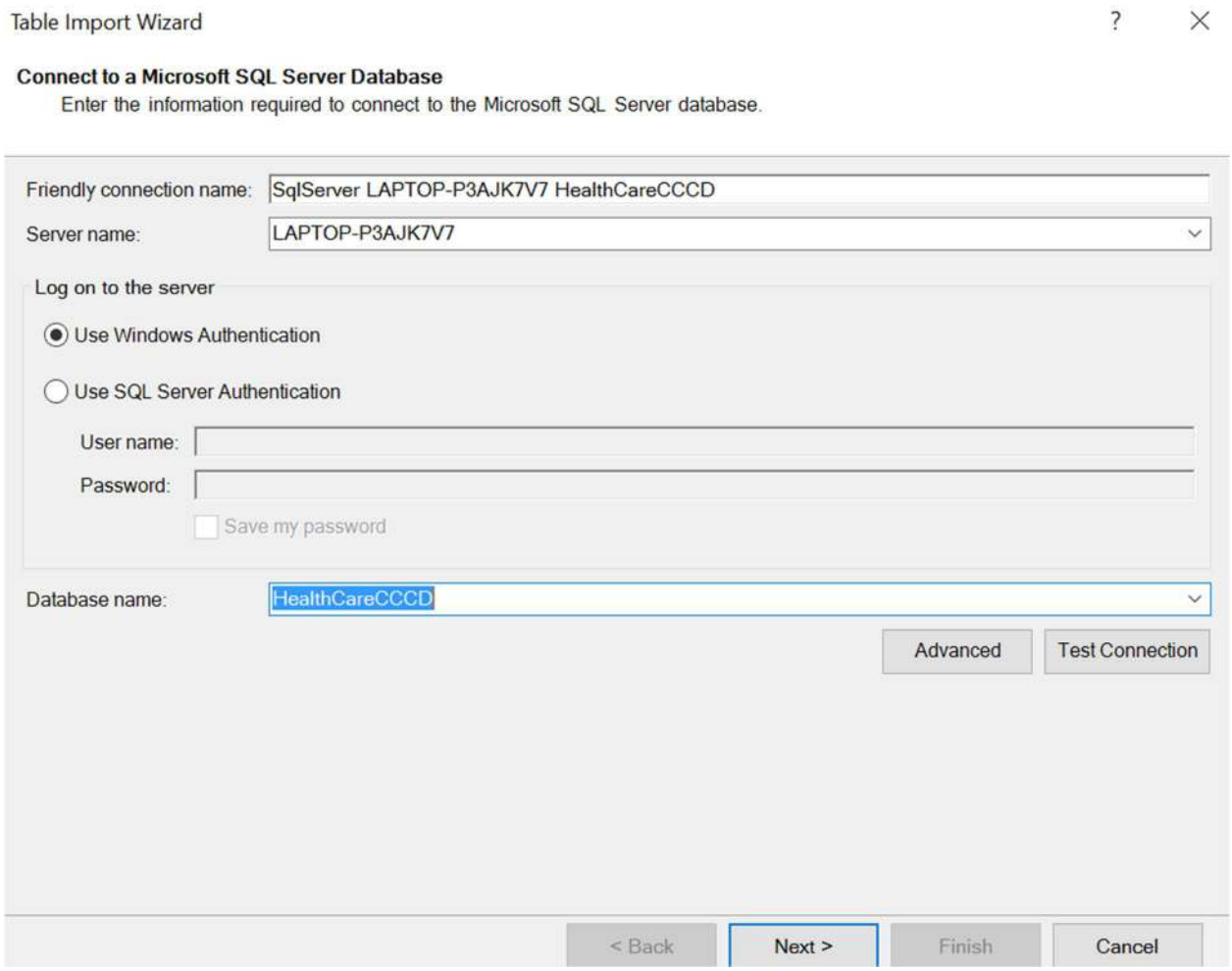


Import Data from SQL Server

1. In the Power Pivot window, click **Get External Data** > **From Database** > **From SQL Server**
2. In **Connect to Microsoft SQL Server Database**, in **Server or File Name**, enter the

name of SQL Server instance where your Data Warehouse is located.

3. Click the down arrow to the right of the **Database name** list, and select an Analysis Services database from the list
4. Click **Test Connection** to verify that the server is available.
5. Click **Next**



6. On the **Choose How to Import the Data** screen click the radial button for **Select from a list of tables and views to choose the data to import**
7. Click **Next**
8. Select the tables and views that you want included.
    a. You can change any **Source Table** name to **Friendly Name**
    b. You can click **Preview and FIlter** to exclude columns and data
9. Click **Finish** to complete import process

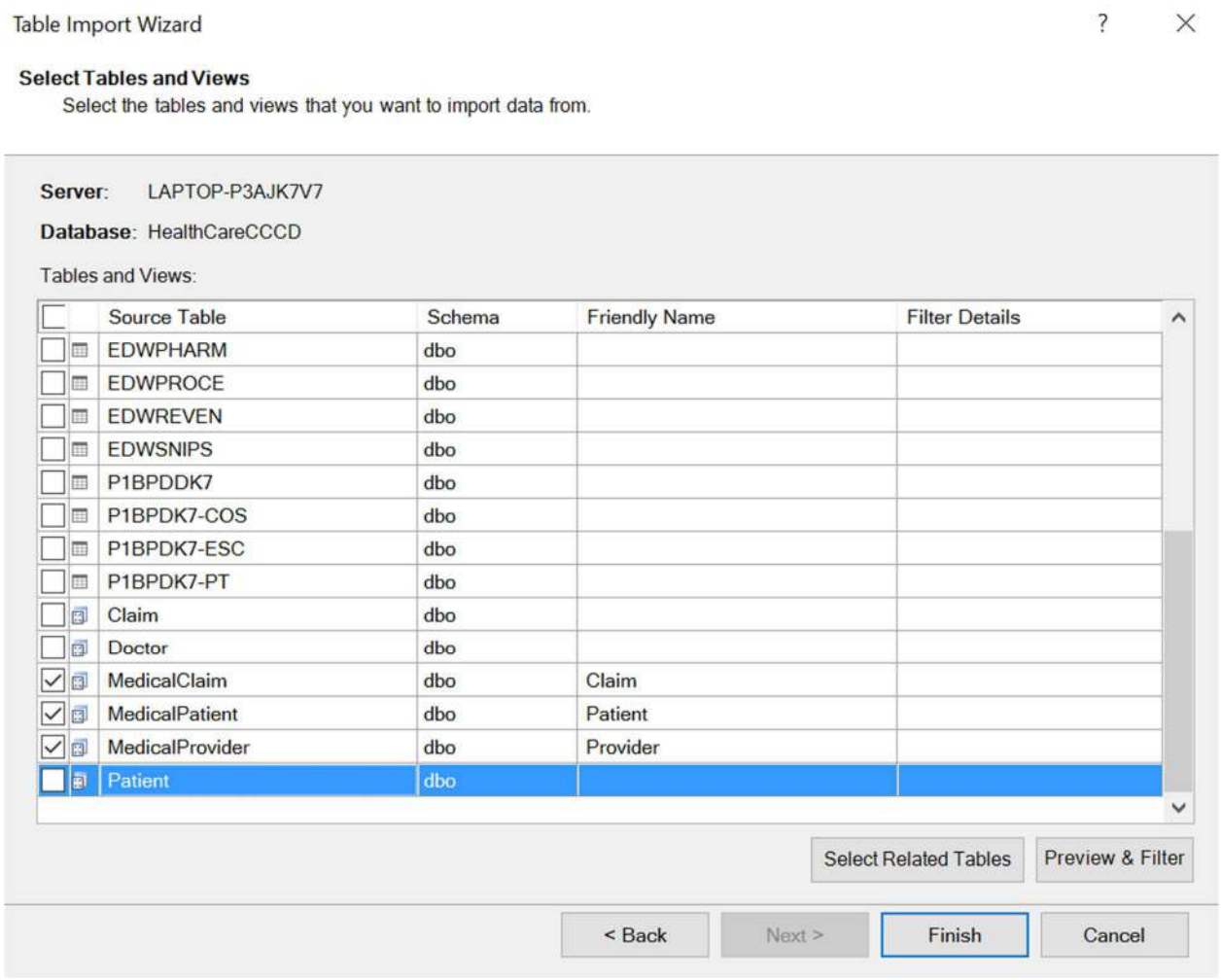
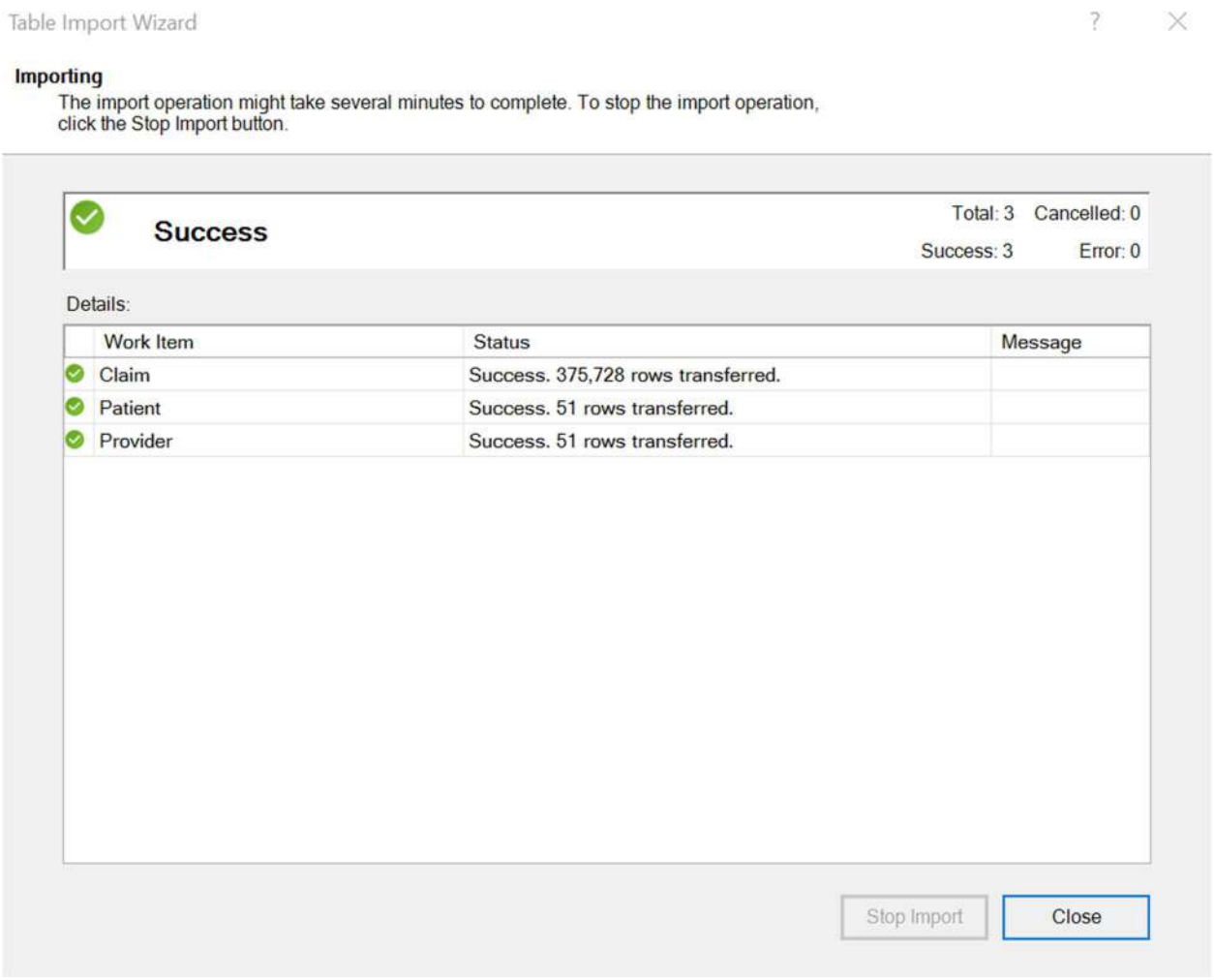
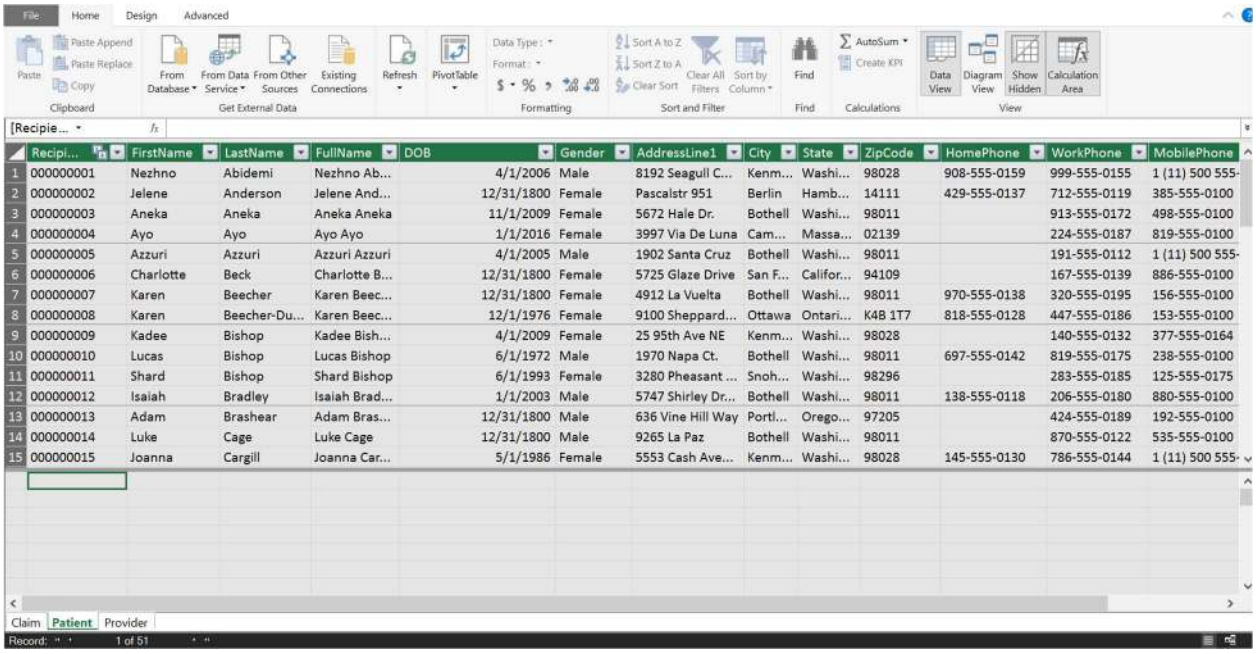


Table Import Wizard
Select Tables and Views
Select the tables and views that you want to import data from.
Server: LAPTOP-P3AJK7V7
Database: HealthCareCCCD
Tables and Views:
Source Table
Schema
Friendly Name
Filter Details
EDWPHARM dbo
EDWPROCE dbo
EDWREVEN dbo
EDWSNIPS dbo
P1BPDDK7 dbo
P1BPDK7-COS dbo
P1BPDK7-ESC dbo
P1BPDK7-PT dbo
Claim dbo
Doctor dbo
MedicalClaim dbo Claim
MedicalPatient dbo Patient
MedicalProvider dbo Provider
Patient dbo
Select Related Tables
Preview & Filter
< Back
Next >
Finish
Cancel

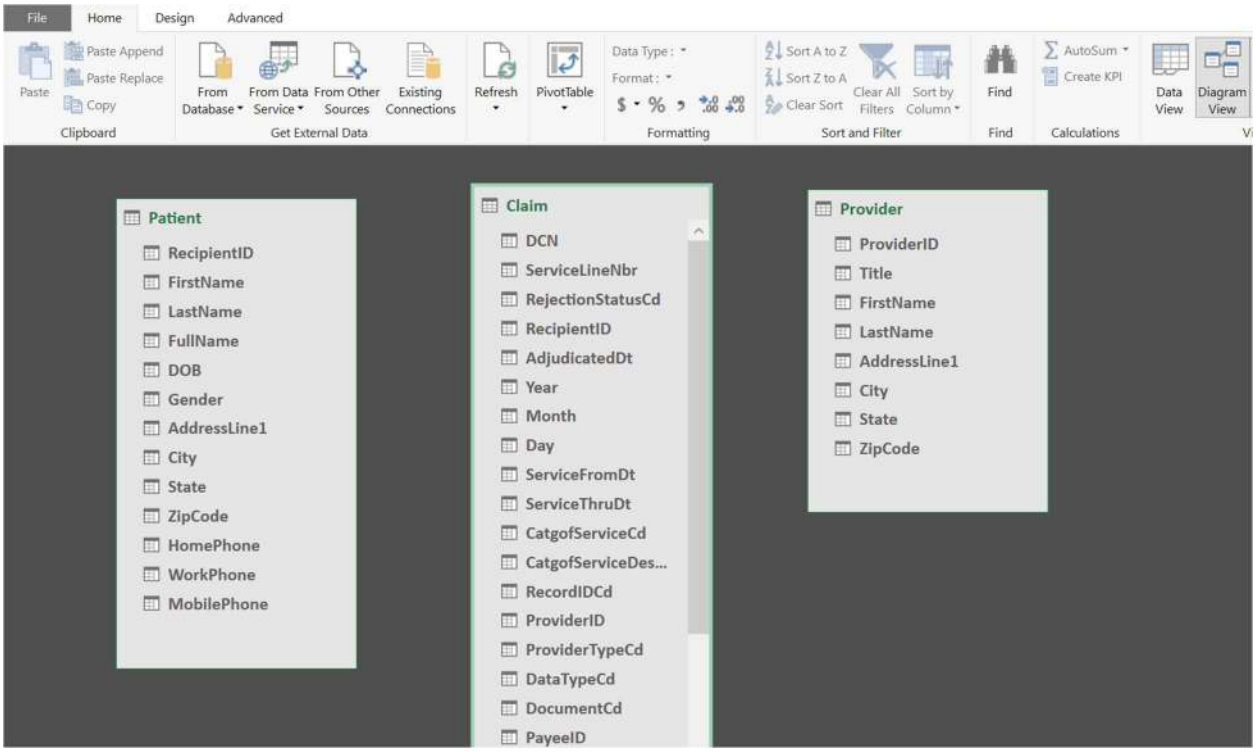


Completed Data Import (below)



	Recipi...	FirstName	LastName	FullName	DOB	Gender	AddressLine1	City	State	ZipCode	HomePhone	WorkPhone	MobilePhone
1	000000001	Nezhno	Abidemi	Nezhno Ab...	4/1/2006	Male	8192 Seagull C...	Kenm...	Washi...	98028	908-555-0159	999-555-0155	1 (11) 500 555-
2	000000002	Jelene	Anderson	Jelene And...	12/31/1800	Female	Pascalstr 951	Berlin	Hamb...	14111	429-555-0137	712-555-0119	385-555-0100
3	000000003	Aneka	Aneka	Aneka Aneka	11/1/2009	Female	5672 Hale Dr.	Bothell	Washi...	98011		913-555-0172	498-555-0100
4	000000004	Ayo	Ayo	Ayo Ayo	1/1/2016	Female	3997 Via De Luna	Cam...	Massa...	02139		224-555-0187	819-555-0100
5	000000005	Azzuri	Azzuri	Azzuri Azzuri	4/1/2005	Male	1902 Santa Cruz	Bothell	Washi...	98011		191-555-0112	1 (11) 500 555-
6	000000006	Charlotte	Beck	Charlotte B...	12/31/1800	Female	5725 Glaze Drive	San F...	Califor...	94109		167-555-0139	886-555-0100
7	000000007	Karen	Beecher	Karen Beec...	12/31/1800	Female	4912 La Vuelta	Bothell	Washi...	98011	970-555-0138	320-555-0195	156-555-0100
8	000000008	Karen	Beecher-Du...	Karen Beec...	12/1/1976	Female	9100 Sheppard...	Ottawa	Ontari...	K4B 1T7	818-555-0128	447-555-0186	153-555-0100
9	000000009	Kadee	Bishop	Kadee Bish...	4/1/2009	Female	25 95th Ave NE	Kenm...	Washi...	98028		140-555-0132	377-555-0164
10	000000010	Lucas	Bishop	Lucas Bishop	6/1/1972	Male	1970 Napa Ct.	Bothell	Washi...	98011	697-555-0142	819-555-0175	238-555-0100
11	000000011	Shard	Bishop	Shard Bishop	6/1/1993	Female	3280 Pheasant ...	Snoh...	Washi...	98296		283-555-0185	125-555-0175
12	000000012	Isaiah	Bradley	Isaiah Brad...	1/1/2003	Male	5747 Shirley Dr...	Bothell	Washi...	98011	138-555-0118	206-555-0180	880-555-0100
13	000000013	Adam	Brashear	Adam Bras...	12/31/1800	Male	636 Vine Hill Way	Portl...	Orego...	97205		424-555-0189	192-555-0100
14	000000014	Luke	Cage	Luke Cage	12/31/1800	Male	9265 La Paz	Bothell	Washi...	98011		870-555-0122	535-555-0100
15	000000015	Joanna	Cargill	Joanna Car...	5/1/1986	Female	5553 Cash Ave...	Kenm...	Washi...	98028	145-555-0130	786-555-0144	1 (11) 500 555-

Diagram View - Table Relationships



Save the Model Project

It is important to frequently save your model project.

To save the model project

- In SQL Server Data Tools, click on the **File** menu, and then click **Save All**.

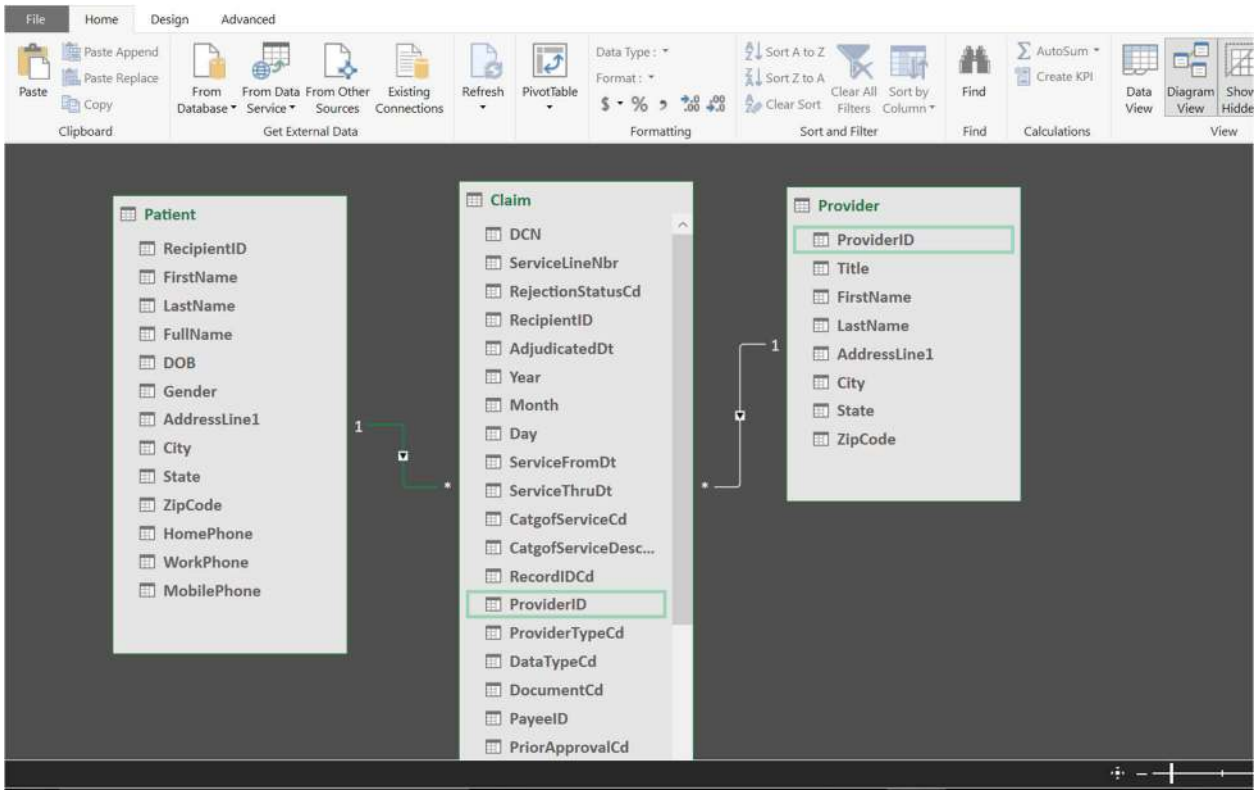
Review Existing Relationships and Add New Relationships

A relationship is a connection between two tables that establishes how the data in those tables should be correlated. For example, the Product table and the Product Subcategory table have a relationship based on the fact that each product belongs to a subcategory.

When you imported data by using the Table Import Wizard, you imported seven tables from the AdventureWorksDW database. Generally, if you import data from a relational source, existing relationships are automatically imported together with the data. However, before you proceed with authoring your model you should verify those relationships between tables were created properly. For this tutorial, you will also add three new relationships.

To add new relationships between tables

1. In the model designer, in the **Provider** table, click and hold on the **ProviderID** column, then drag the cursor to the **Claim** column in the **Provider** table, and then release.
    a. A solid line appears showing you have created an active relationship between the **ProviderID** column in the **Provider** table and the **ProviderID** column in the **Claim** table.
2. In the **Patient** table, click and hold on the **RecipientID** column, then drag the cursor to the **RecipientID** column in the **Claim** table, and then release.
    a. A dotted line appears showing you have created an inactive relationship between the **RecipientID** column in the **Patient** table and the **RecipientID** column in the **Claim** table. You can have multiple relationships between tables, but only one relationship can be active at a time.



To review existing relationships

1. Using the top Ribbon, click **Home**, under the **View** section click **Diagram View**.
    a. The model designer now appears in Diagram View, a graphical format displaying all of the tables you imported with lines between them. The lines between tables indicate the relationships that were automatically created when you imported the data.
    b. Use the minimap controls in the lower-right corner of the model designer to adjust the view to include as many of the tables as possible. You can also click and drag tables to different locations, bringing tables closer together, or putting them in a particular order. Moving tables does not affect the relationships already between the tables. To view all of the columns in a particular table, click and drag on a table edge to expand or make it smaller.

Create a Calculated Column

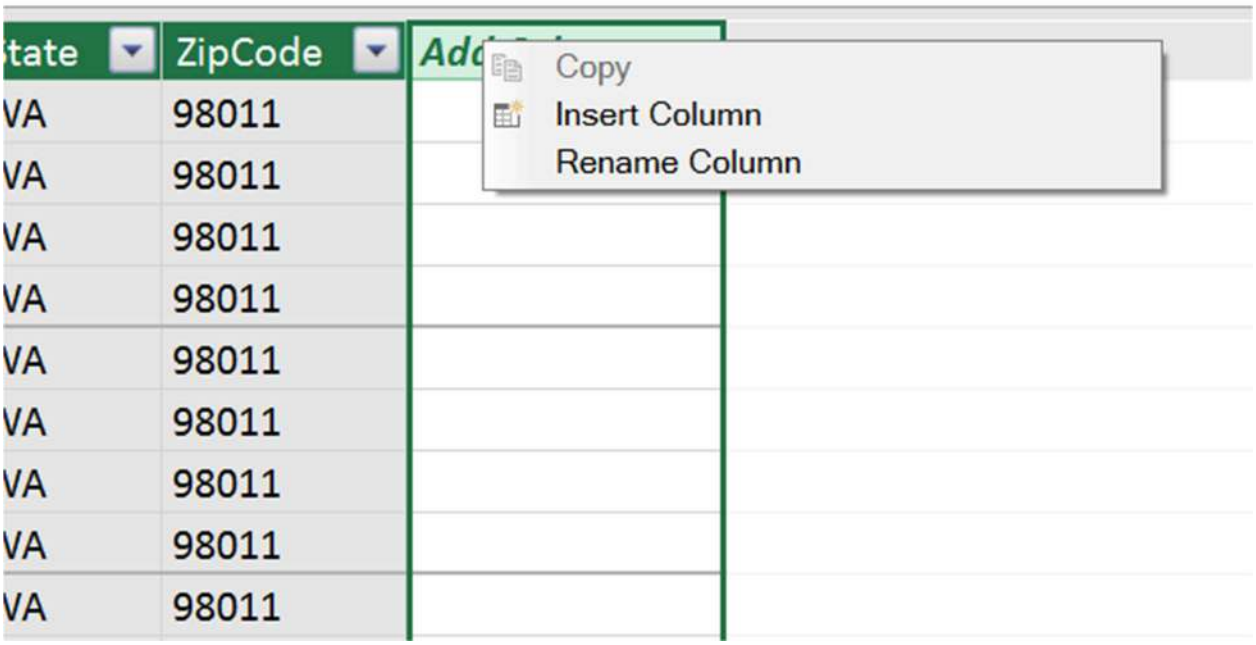
A calculated column is a column created by a dax formula that creates a value by calculating data that already exists in the model.

Create a calculated column in the Provider table

1. sing the top Ribbon, click **Home**, under the **View** section click **Data View**.

a. Calculated columns can only be created by using the model designer in Data View.

2. In the model designer, click the **Provider** table (tab).
3. Right-click the ***Add Column*** column header, and then click **Insert Column**.



4. A new column named **Calculated Column 1** is inserted to the right of the **ZipCode** column.
5. In the formula bar above the table, type the following formula. AutoComplete helps you type the fully qualified names of columns and tables, and lists the functions that are available.
    a. **=[Title]&" "&[FirstName]&" "&[LastName]**
    b. When you have finished building the formula, press ENTER.
    c. Values are then populated for all the rows in the calculated column. If you scroll down through the table, you will see that rows can have different values for this column, based on the data that is in each row.
6. Rename this column to **FullName**.

[FullNa... ▾ | fx | =[Title]&" "&[FirstName]&" "&[LastName]

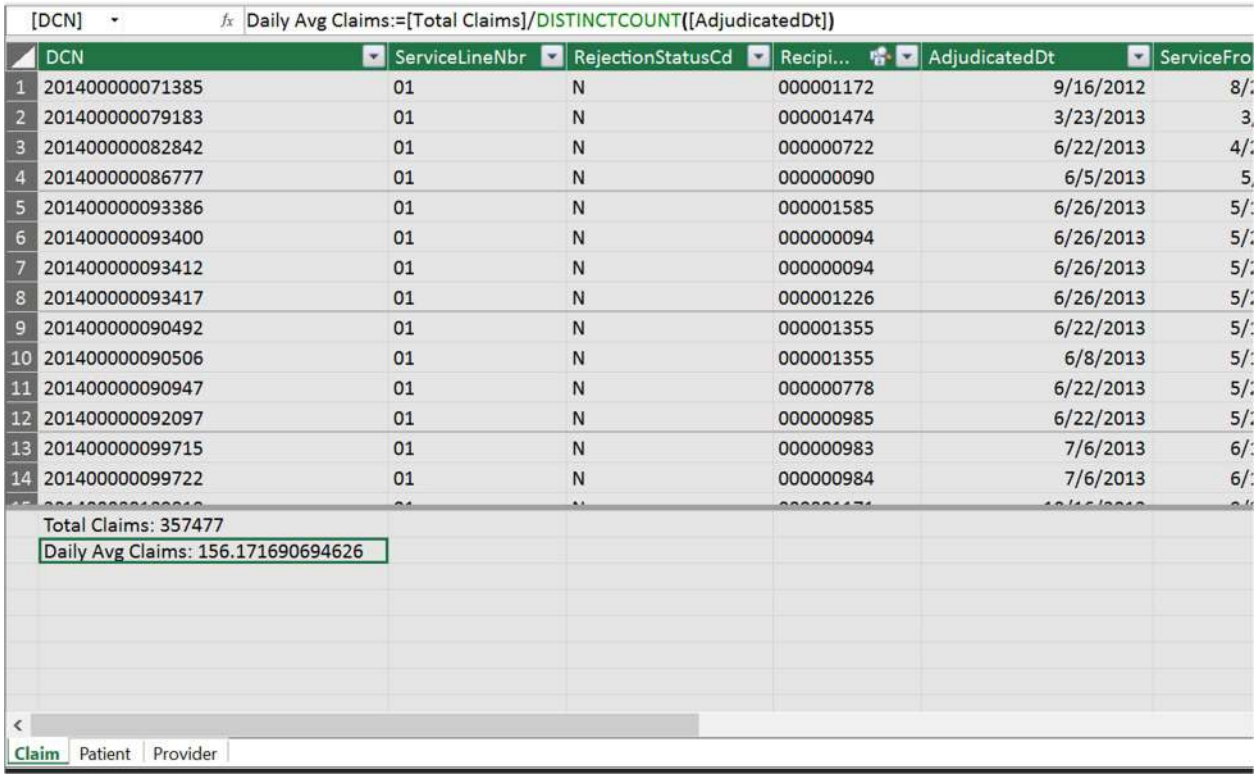
	Provi...	Title	FirstName	LastName	AddressLine1	City	State	ZipCode	FullName	Add
1	036044607	Dr	Zenzi	Zenzi	1970 Napa Ct.	Bothell	WA	98011	Dr Zenzi Zenzi	
2	036123417	Dr	John	Stewart	9265 La Paz	Bothell	WA	98011	Dr John Stewart	
3	036110272	Dr	Celia	Windward	9833 Mt. Dias ...	Bothell	WA	98011	Dr Celia Windward	
4	399447366	Dr	Samuel	Wilson	7484 Roundtre...	Bothell	WA	98011	Dr Samuel Wilson	
5	036106249	Dr	Shuri	Shuri	8157 W. Book	Bothell	WA	98011	Dr Shuri Shuri	
6	036112278	Dr	Martha	Washington	9539 Glenside Dr	Bothell	WA	98011	Dr Martha Washington	
7	036058775	Dr	S'Yan	S'Yan	4912 La Vuelta	Bothell	WA	98011	Dr S'Yan S'Yan	
8	036079981	Dr	Tetu	Tetu	8713 Yosemite ...	Bothell	WA	98011	Dr Tetu Tetu	
9	036066171	Dr	Amanda	Waller	1226 Shoe St.	Bothell	WA	98011	Dr Amanda Waller	
10	036041603	Dr	Willie	Walker	1399 Firestone ...	Bothell	WA	98011	Dr Willie Walker	
11	036066410	Dr	T'Challa	T'Challa	250 Race Court	Bothell	WA	98011	Dr T'Challa T'Challa	
12	036049731	Dr	Heather	Tucker	5672 Hale Dr.	Bothell	WA	98011	Dr Heather Tucker	
13	036087664	CDR	James	Rhodes	40 Ellis St.	Bothell	WA	98011	CDR James Rhodes	
14	036066429	Dr	Everett	Thomas	6387 Scenic Av...	Bothell	WA	98011	Dr Everett Thomas	
15	264319386	Dr	Jennifer	Pierce	5747 Shirley Dr...	Bothell	WA	98011	Dr Jennifer Pierce	

Create a Measure

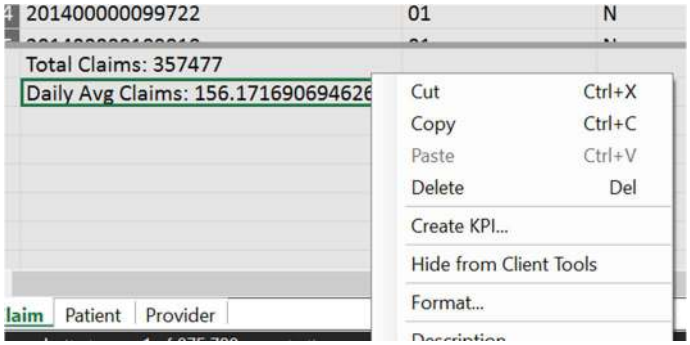
Similar to the calculated columns you created in the previous lesson, a measure is essentially a calculation created using a DAX formula. However, unlike calculated columns, measures are evaluated based on a user selected *filter*; for example, a particular column or slicer added to the Row Labels field in a PivotTable. A value for each cell in the filter is then calculated by the applied measure. Measures are powerful, flexible calculations that you will want to include in almost all tabular models, to perform dynamic calculations on numerical data.

To create a Daily Average Number of Claims measure in the Claim table

1. Click the **Claim** table(tab).
2. In the measure grid (lower pane under the dark grey line), click the top-left empty cell.
3. In the formula bar, above the table, type the following formula:
    a. **Total Claims:=DISTINCTCOUNT([DCN])**
    b. When you have finished building the formula, press ENTER.
4. Create a second measure in the below cell, type the following formula:
    a. Daily Avg Claims:=[Total Claims]/DISTINCTCOUNT([AdjudicatedDt])
    b. When you have finished building the formula, press ENTER.

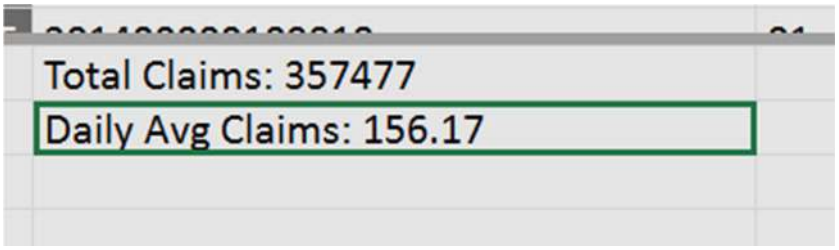


5. You can format the numeric measure value by the right clicking the cell and selecting Format.



6. Once the Formatting Window opens you can then specify how you want to display the numeric value. For our example we utilize the Decimal Number format and then specify the number of decimal places.

6. Click Ok.

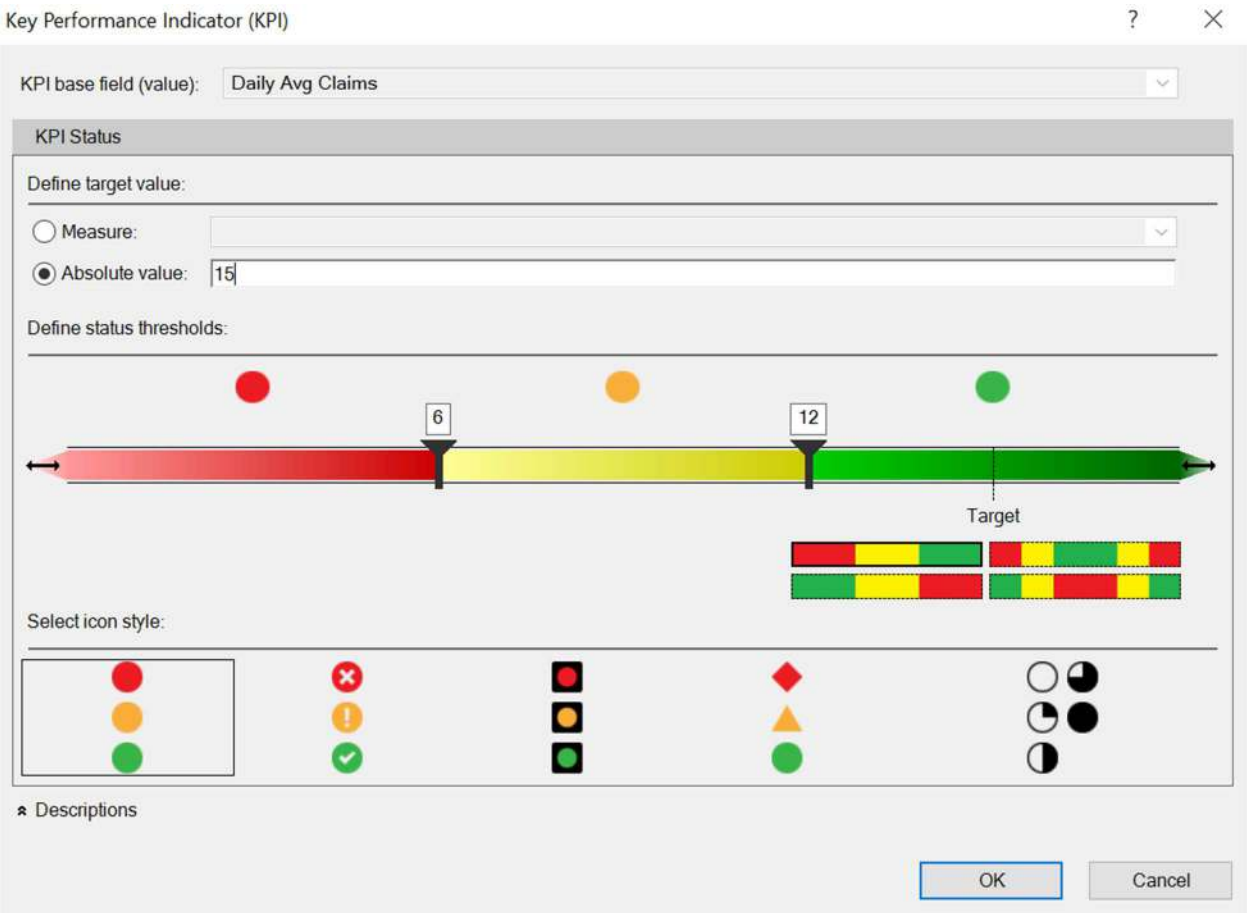


Create Key Performance Indicators

Key Performance Indicators (KPIs) are used to gauge performance of a value, defined by a *Base* measure, against a *Target* value, also defined by a measure or by an absolute value. In reporting client applications, KPIs can provide business professionals a quick and easy way to understand a summary of business success or to identify trends.

To create a Daily Average Claim Performance KPI

1. In the model designer, click the **Claim** table (tab).
2. In the measure grid, right-click the **Daily Avg Claims** measure, and then click **Create KPI**.
    a. The **Key Performance Indicator** dialog box opens.
3. In the **Key Performance Indicator (KPI)** dialog box, in **Target**, select the **Absolute Value** option.
4. In the **Absolute Value** field, type **15**, and then press ENTER.
5. In the left (low) slider field, type **6**, and then in the right (high) slider field, type **12**.
6. In **Select Icon Style**, select the first (red), (yellow), (green) icon type.
7. Click **OK** to complete the KPI.
    a. In the measure grid, notice the icon next to the **Internet Current Quarter Sales Performance** measure. This icon indicates that this measure serves as a Base value for a KPI.



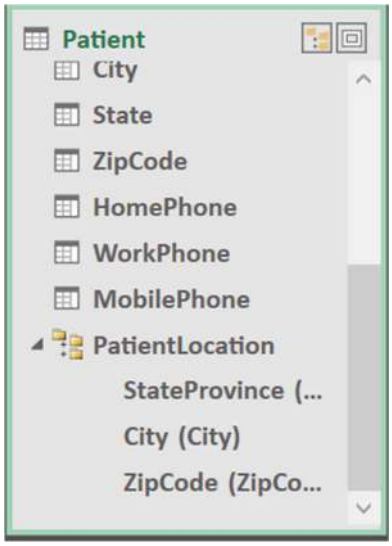
Create a Hierarchy

Hierarchies are metadata that define relationships between two or more columns in a table, thus defining the relative position of column to another column.

To create a Category hierarchy in the Patient table

1. Using the top Ribbon, click **Home**, under the **View** section click **Diagram View**.
2. Right-click the **Patient** table, and then click **Create Hierarchy**. A new hierarchy appears at the bottom of the table window.
3. In the hierarchy name, rename the hierarchy by typing **PatientLocation**, and then press ENTER.
4. In the **Patient** table, right click the **State** column, in the pop up box go to **Add to Hierarchy** and then click **Locations**.
5. In the **Patient** table, click the **City** column, then drag it to the **Locations** hierarchy, releasing it below **State**.
6. In the **Patient** table, click the **ZipCode** column, then drag it to the **Locations** hierarchy, releasing it below **City**.

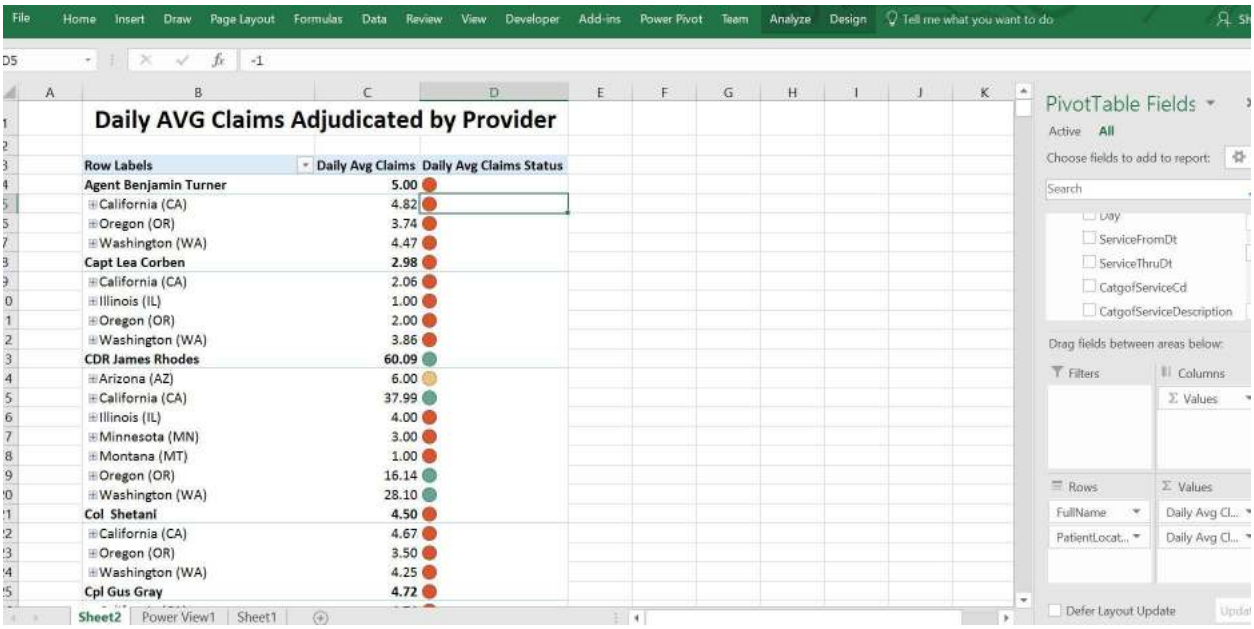
7. In the **Patient** table, click the **Address** column, then drag it to the **Locations** hierarchy, releasing it below **ZipCode**.
8. In the **Locations** hierarchy, right-click the **State** column, then click **Rename**, and then type **StateProvince**.
9. Note: Ensure that the columns in the hierarchy are in logical order. Typically the column with the least uniqueness (based on business) should be near the top of the list and the column with the highest uniqueness (based on the business) should be near the bottom of the list.



Create a PivotTable

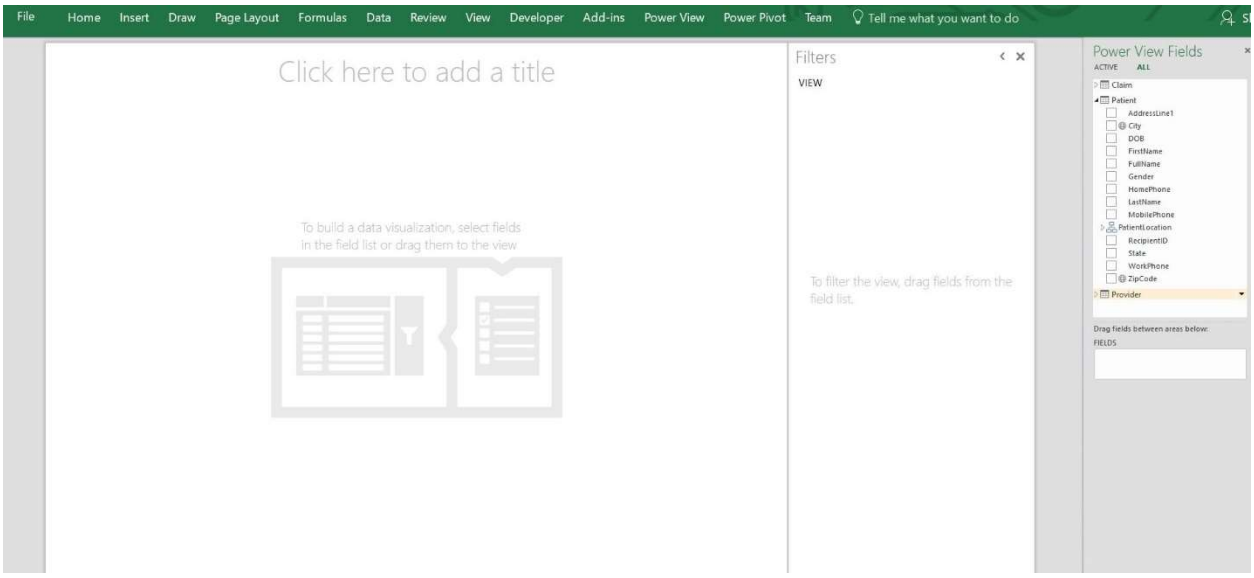
1. While in **PowerPivot** click the **PivotTable** button
2. On the **Create PivotTable** screen select **New Worksheet**
   a. A new PivotTable Worksheet is created
3. Under **PivotTable Fields** do the following
   a. Go to **Provider**. Select **FullName**.
   b. Go to **Patient.** Select **PatientLocation**.
   c. Go to **Claim** > **Daily Avg Claims**, Select **Value** and **Status**.
4. Give it a title
5. Complete. You've created a **PivotTable**

Note**:** Use the **Filters** pane (in PivotTable Fields pane) to only display specific data that you want shown in yourPivotTable.



Create a Power View Workbook

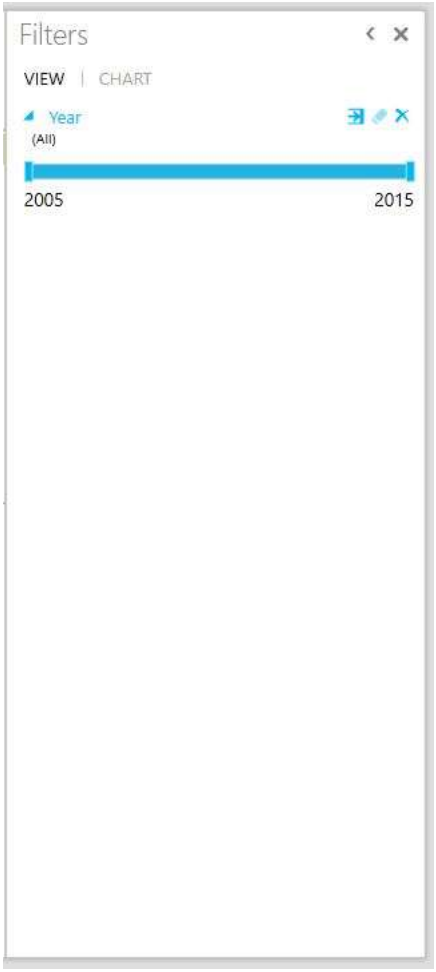
1. Navigate back to your excel workbook to display your previously created PivotTable
2. Using the top Ribbon, go to Insert and then click the Power View button
3. Excel creates a Power View Sheet with your data model in the Field List



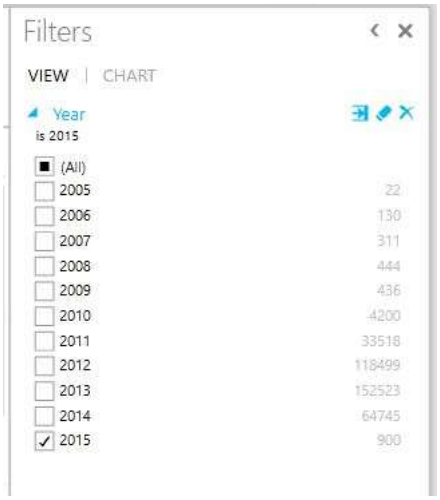
4. In the **Power View Fields** list do the following
    a. Go to **Patient**. Select **FullName**.
    b. Go to **Claim** > **Daily Avg Claims**, Select **Value** and **Status**.
5. Go to **Design**, (In the **Switch Visualizations** section) go to **Other Chart** and Select **Pie**.
6. Go to **Layout**, (In the **Labels** section) go to **Title** and Select **None**.
7. Drag the edges of the Chart so that it spaced across the top half of the pane.
8. Right Click the white space within the chart and click **Copy**. Then Right Click the white space below the chart and select **Paste.**
9. Go to **Design**, (In the **Switch Visualizations** section) go to **Column Chart** and Select **Clustured Column.**

Filter the data

1. In the Power View Fields Pane, Go to **Claim** and find **Year**
2. Drag **Year** to the **Filters** pane
    a. Year will now display in the Filters pane



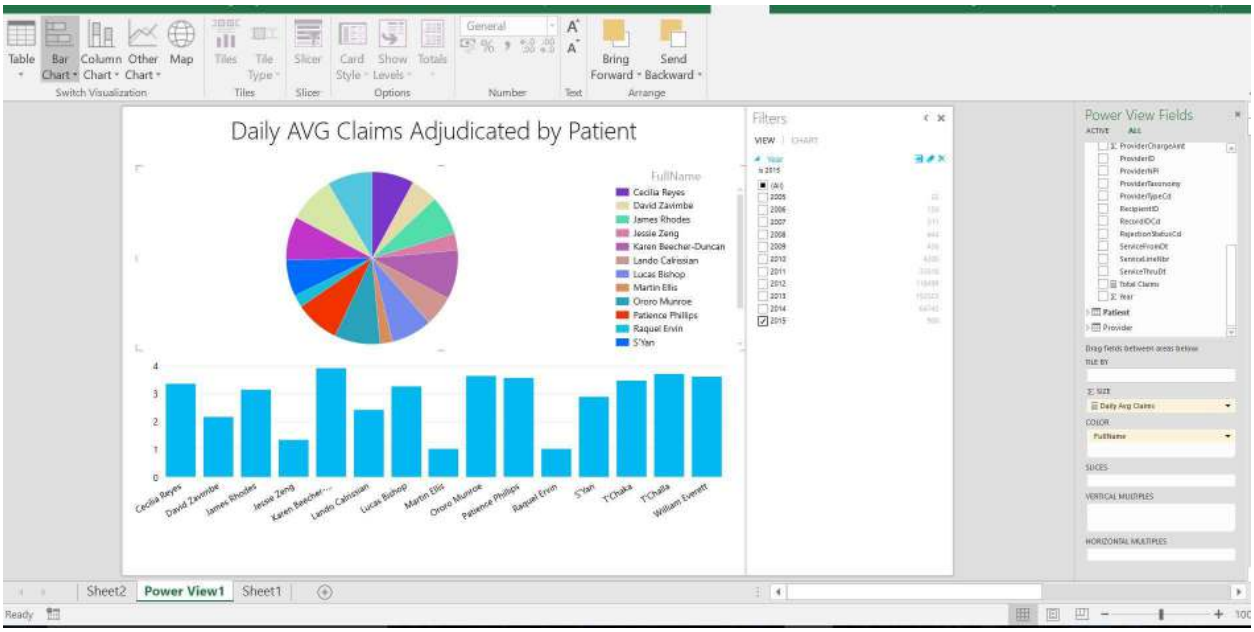
3. Click on the **Advanced Filter Mode** button next to Year in the Filter pane
4. Select radial box with the most current year
5. The Power View displays the charts for the most current year
6. Click where it says, "**Click here to add a title**" and **give it a title**.
7. Complete, you've created a **Power View** report**.**



Note**: Interactivity:** By clicking on any part of either chart, the visualization will interact and react to your selection by highlighting/emphasizing your specific

Note: **Interactivity**: Direct your mouse/pointer to any portion of your chart - PowerView will display additional data about that specific section

Note: You can change or add to the view by making additional selection from the **Power View Fields** pane



END