Massachusetts Department of Public Health

MDPH Tuesday Infectious Disease Webinar Series

PivotTable Training for LBOH

February 11, 2025

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MAVEN Reminders for 2024 Case Closeout

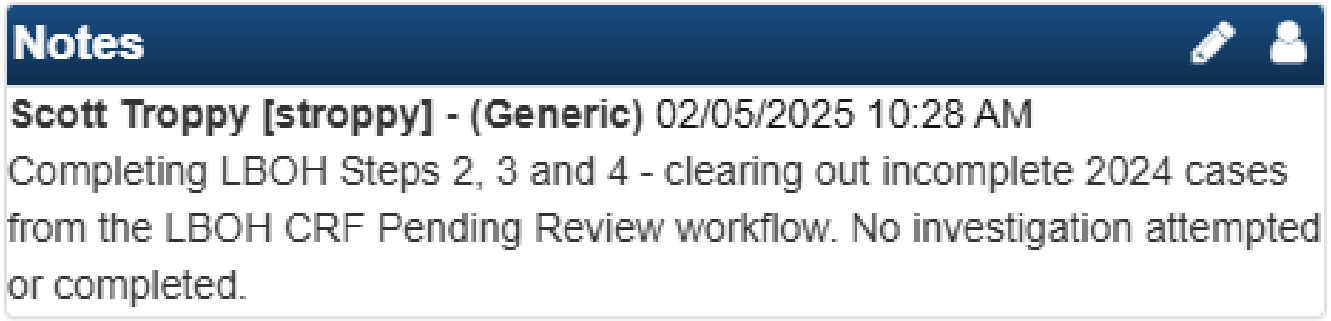
2024 Case Closing

- Starting late March, DSAI staff will complete any 2024 cases that remain in the workflows by completing steps 2, 3 & 4 in the Administrative Question Package. Staff will leave a note in any cases where question packages are updated.

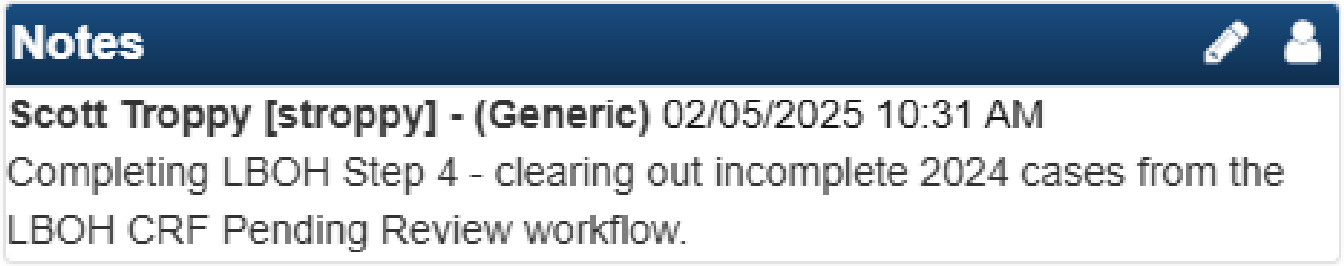
- Friendly Reminder to check your Immediate, Routine, Pending Case Report Form Workflows for 2024 events **today**.

Quick MAVEN Reminders – what you will see in Notes

- If no steps are filled out in the event:



- If any steps are filled out in the event:



MAVEN Release – estimated for late February

A few items in the next release of MAVEN for LBOH:

1. Reviewed/Cleaned up list of organizations in the Step 3-LBOH/Agency.
2. Added a SSA (Shared Services Agency) option in Step 3 with a free text for filling out information for your SSA
3. Added Official City to LBOH workflows (includes TB workflows and Shared Cases workflows).
4. Create an Infection Prevention module (similar to the LBOH Communication Event)
5. Add Environmental Health Contacts to the Communication event.

Overview of MAVEN Reports

- Which **reports** are accessible to you?
  - Reminder we covered this recently: January 14th webinar on MAVEN Reports
- Why are reports useful?
  - MAVEN Tip Sheet Series: MAVEN Reports
- What's in a report?
  - Case information
  - Tracking information
  - Timeliness
- Best reports to use for PivotTables
- How to run a report

Which Reports can you access?

Report access will vary depending on the role and responsibilities of the user in MAVEN.

For example: Local Board of Health staff who is responsible for disease case investigation and following up will only have access to LBOH related reports.

Examples of Commonly ran LBOH reports:

- LBOH Basic Line List
- LBOH Events by Time Period
- LBOH Count – Events Per Disease and Classification in Jurisdiction
- LBOH Event Information Extract by Disease Category and Region (Demo from Pooja)

Why are reports useful?

Usefulness of Reports

- Reports provide a view of all events within a jurisdiction or facility that exist in MAVEN regardless if they're recent, old, or the investigation status is pending or completed.
- Reports can be used for tracking information.
- Depending on the report type the output can be aggregate or list format.
- Timeliness of the data in reports allows for quicker response and follow-up.

Information in a Report

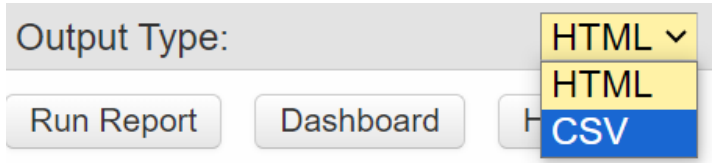
- Reports include case information, demographic information, case counts, and notes.

Best Reports for PivotTables

- The best type of report to use in a PivotTable is a **case-level** report formatted as a list.
- Microsoft Excel tables are already in list format and are good candidates for PivotTable source data.

CaseID	Disease	Disease Classificat	Event Date	Create Date	First Name	Middle Name	Last Name	County	CRF_COMPLETE	CRF_COMPLETED_BY
100002504	MENUT	CONFIRMED	3/7/2023	3/7/2023	Tammy	T	Menutest	Middlesex County	YES	LBOH
100003870	BAB	PROBABLE	9/1/2023	12/8/2023	Frank	A	Babtest	Middlesex County	YES	LBOH
100003878	LEG	CONFIRMED	9/1/2023	12/8/2023	Joey	I	Legtest	Middlesex County	YES	LBOH

- Most MAVEN reports contain case-level information in list format. Reports can be download as CSV or HTML files. The CSV file can be opened using Microsoft Excel.



How to run a report

- **Step 1: Navigate to reports page**

  Select the report that you would like to run.

- **Step 2: Select parameters**

  Parameters allow you to customize your report output. Different reports may have different options for parameters.

  Most reports will include at minimum: Event Date, Report Format, Classification, and Official City.

How to run a report (cont.)

- **Step 3: Run Report**

  When you have your parameters set, hit 'Run Report'.

  If you ran the report in CSV format, a file will appear in your downloads folder or the folder where your file downloads usually default.

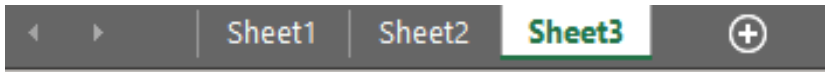
  ***Note**: Depending on the size of your report, the export may take a few minutes to complete. Please, be patient and do not navigate away from the screen while the report is running.

  If you ran the report in HTML format, a new screen should appear in your web browser with your report.

  Please make sure to delete the file from your downloads or default folder once you have moved or stored it appropriately.

Terms

- Excel
  - Refers to Microsoft Excel, a software program sold by Microsoft that creates spreadsheets
- Workbook
  - An Excel file. The file can contain multiple spreadsheets within it.
- Sheet
  - An individual spreadsheet within the workbook
  - Some people call them "tabs" because they look like this at the bottom:



- Ribbon
  - Menu at the top of all Microsoft programs
- Tab
  - Sections within the Ribbon

What the heck is a CSV or XLSX?

- **CSV**
  - Stands for "comma separated values"
  - Is a file type that works with Excel and other programs
  - Is a simpler format and does not have all the functions
    - For example, you cannot save multiple sheets in one CSV file
- **XLSX**
  - The newer format type for Excel
  - Has all the functionality that Excel has to offer
  - Upgrade of the XLS format

Overview of PivotTables

- What are **PivotTables** and why are they useful?
- How to set up a **PivotTable**
  - Navigating Excel
  - Set up your data
  - Inserting a Pivot Table
- Summarizing data with a **PivotTable**
- Tips and tricks
  - Updating a PivotTable
  - Saving your results
  - Adding charts
  - More resources

What are PivotTables?

- A **PivotTable** is a table of aggregated, grouped values

- A **PivotTable** is Microsoft's function to create pivot tables
  - Made as a part of Microsoft Excel
    - Other spreadsheet software may have similar functions under a different name
  - Easily aggregates (adds, finds the average of etc.) another table or a set of data by one or more categories
  - For example, a PivotTable could count a list of cases by year and town
- Aggregation can include sums, averages, or other statistics
- Groups can be nearly anything included in the data set
- Can make graphs/charts too
- Useful because it's a fast way to look at data

Why use a PivotTable?

F	G	H	I
Age (in years)	Gender	Is case Hispanic?	Race
60.0219	Female	No	White
85.1116	Male	No	White
70.3655	Female	No	White
53.3142	Male	No	White
79.4552	Male	Unknown	White
67.9398	Male	No	White
55.1321	Female	No	White
83.3922	Female	Unknown	White
55.4771	Male	Yes	White
58.6502	Female	Unknown	White,Other
28.898	Male	No	White,Other
32.9062	Female	No	White,American Indian
30.8583	Female	No	White
31.8905	Female	Unknown	White
21.2375	Female	No	White
49.41	Male	No	White
32.7912	Male	No	White

Looking at a data set like this one, how would you answer the following questions:

- How many cases have their gender listed as "female"?
- What percent of cases identify as Hispanic?
- What's the age distribution of cases?

Example PivotTable

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1														
2														
3	Count of Event Date	Column Labels												
4	Row Labels	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Grand Total
5	⊞2020		1	99	652	99	18	6	10	8	27	46	129	1095
6	⊞2021	116	44	22	17	10	4	6	18	26	17	28	99	407
7	⊞2022	154	21											175
8	Grand Total	270	66	121	669	109	22	12	28	34	44	74	228	1677
9														

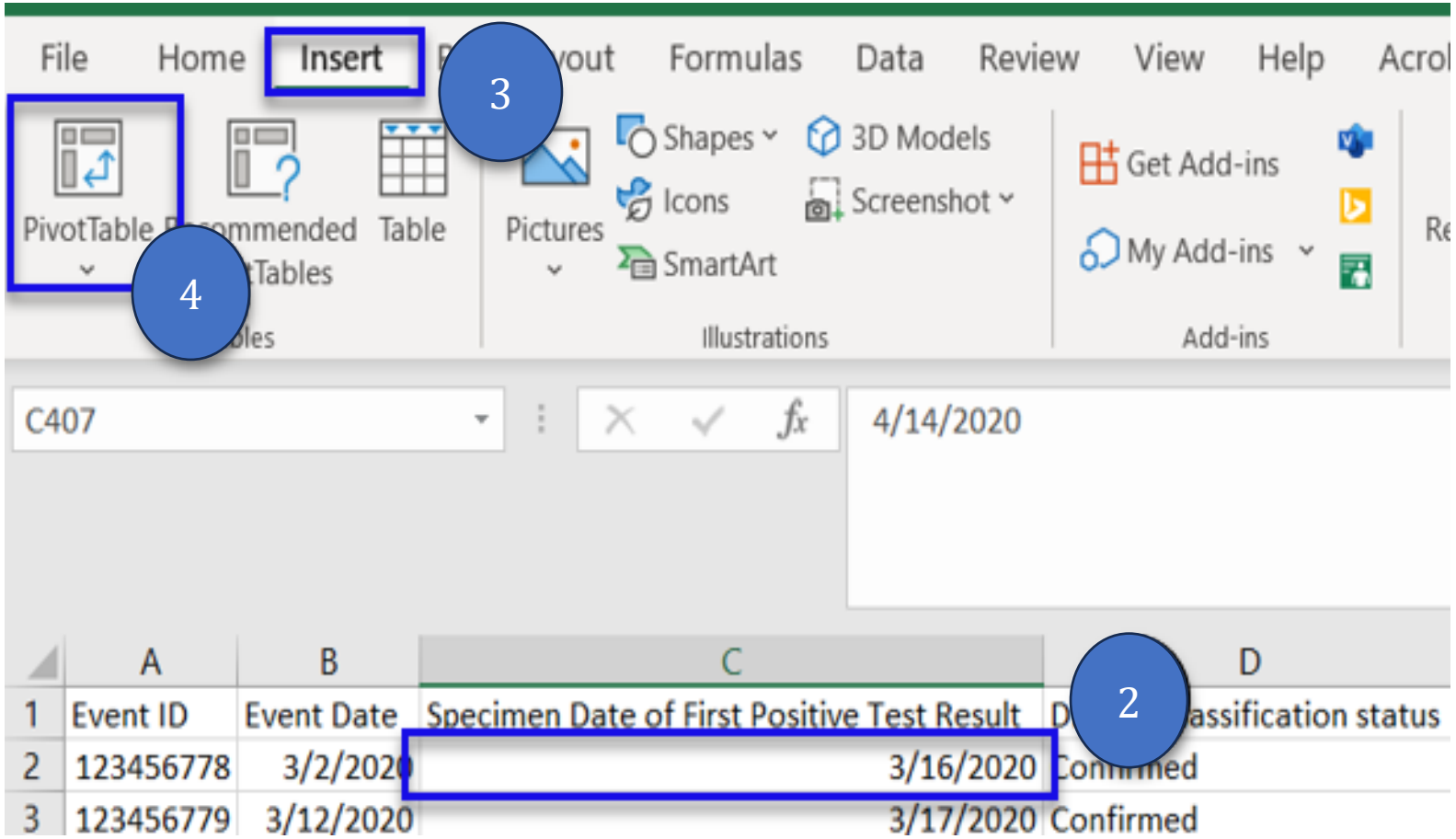
Navigating Excel

- Excel is a part of the Microsoft Office software
- For this webinar we are using Microsoft Excel for Microsoft 365 on Windows
  - If you have an older version, you should still have PivotTables (PivotTables were added to Excel in 1994!)
  - Web version of Excel also has PivotTables
- Basic steps for PivotTables will be the same
  - Some parts might have slightly different names, colors, buttons, depending on your version of Excel

Set up your data

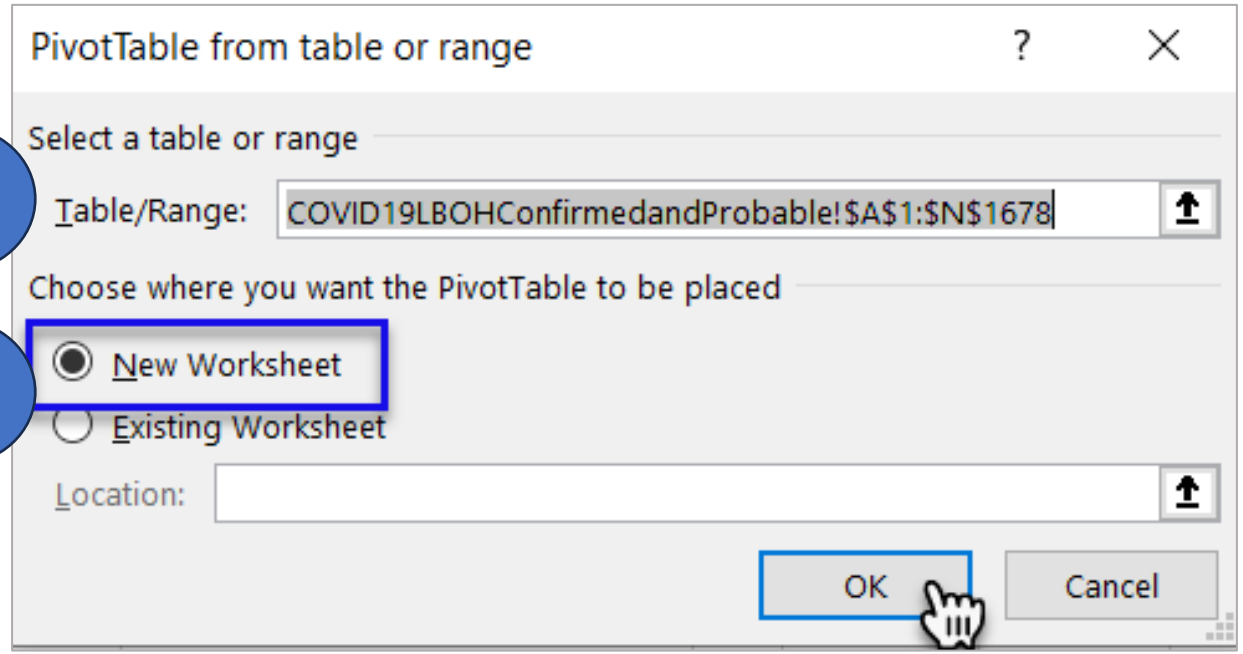
- **PivotTables** are only as good as the data within them
- Considering deleting or not selecting columns you won't use
  - Do the same for titles, footnotes, or other "extras"
- Seeing a lot of missing or incorrect values? Make sure your cases in MAVEN are filled out completely

How to create a PivotTable



1. Open your Workbook and go to the Sheet with your data
2. Place cursor in one of the fields in the spreadsheet
3. Go to the Ribbon and click on Insert tab
4. Click on PivotTable button

How to create a PivotTable



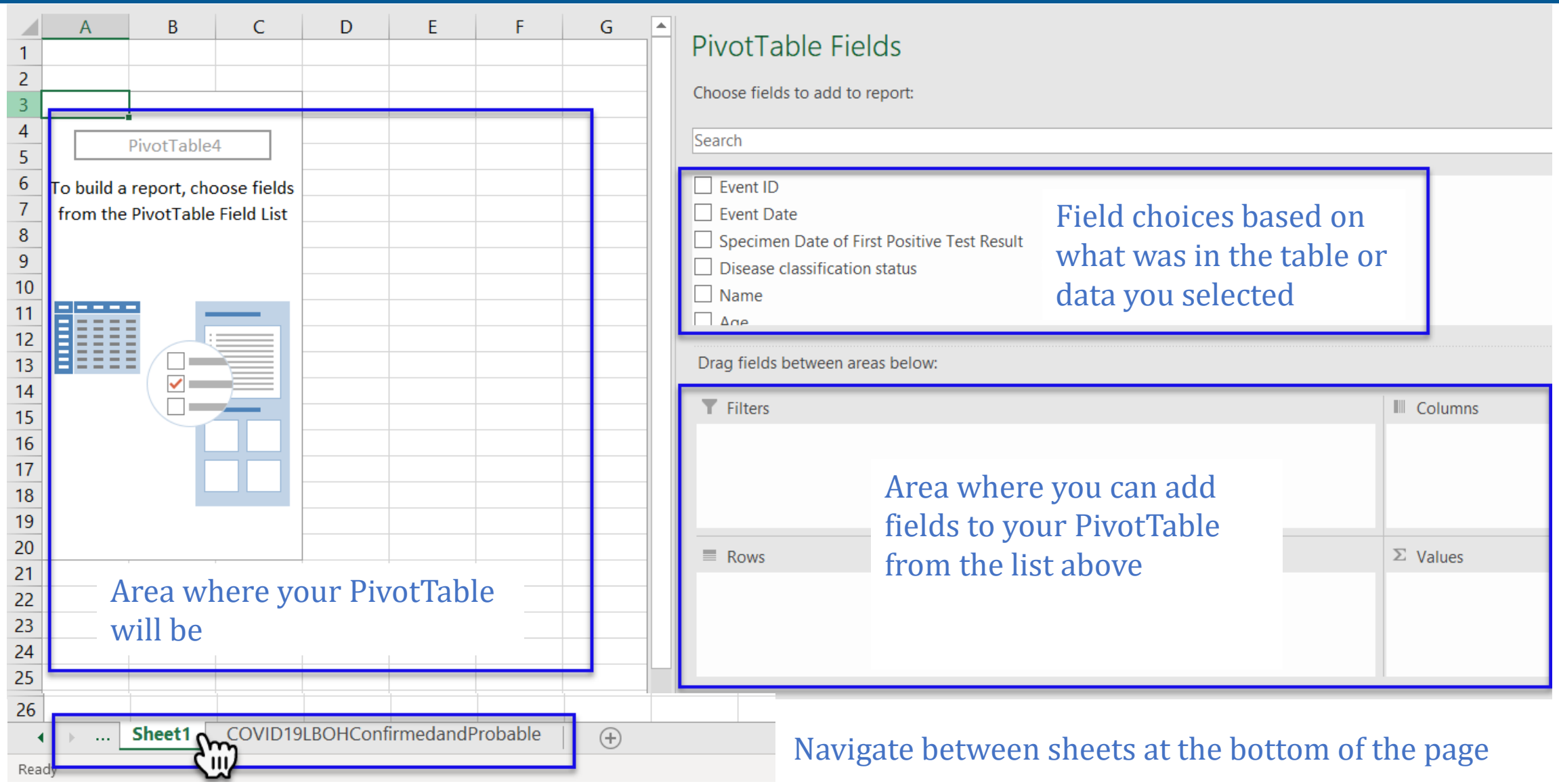
5.1

5.2

A new window will open

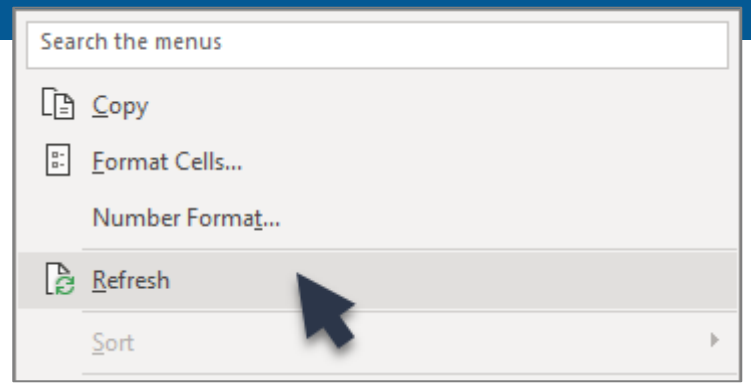
5. Confirm PivotTable settings
    1. Table/ Range includes all your data
    2. Select where you want the new PivotTable to be placed (we recommend a new sheet)

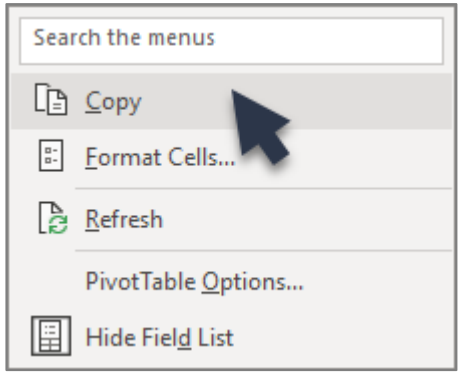
New PivotTable



Tips and Tricks

- Refresh the data in your PivotTable
  - If you correct or update data in your data table, you want it to show on the PivotTable
  - Right-click on the PivotTable and choose Refresh
  - Remember! Making corrections and updates in MAVEN is the only way to make sure that the data are correct every time you run your reports
- Save your results
  - If you don't want your table to be changed or want to change the formatting, consider saving your PivotTable as a separate table
  - Select the whole table, copy it, go to a new place in your workbook, and paste it, choosing "Values" in the Paste Options





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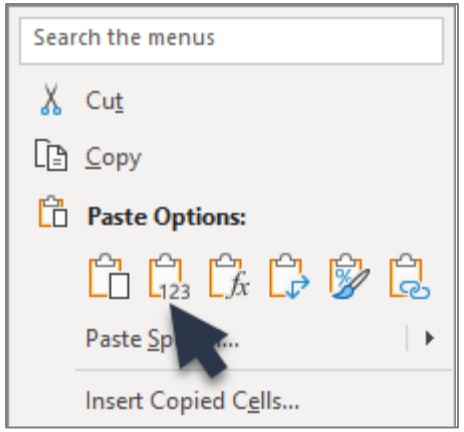

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Pivot Table Demonstration/Use Cases

- Practice scenario – start to finish (Scott & Lionel)
  - Run a report
  - Opening Excel
  - Adding a PivotTable
  - Finding answers with the PivotTable
  - Saving results
- Local Regional Epidemiologist's (Maureen O'Reilly and Pooja Shelke)
  - Pooja MAVEN Data use case
  - Maureen Color Data use case

Pooja Shelke – Regional Epidemiologist

Demo: Tickborne Disease Trends

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Example 1

Public Health Scenario- Tick Borne Disease Trends

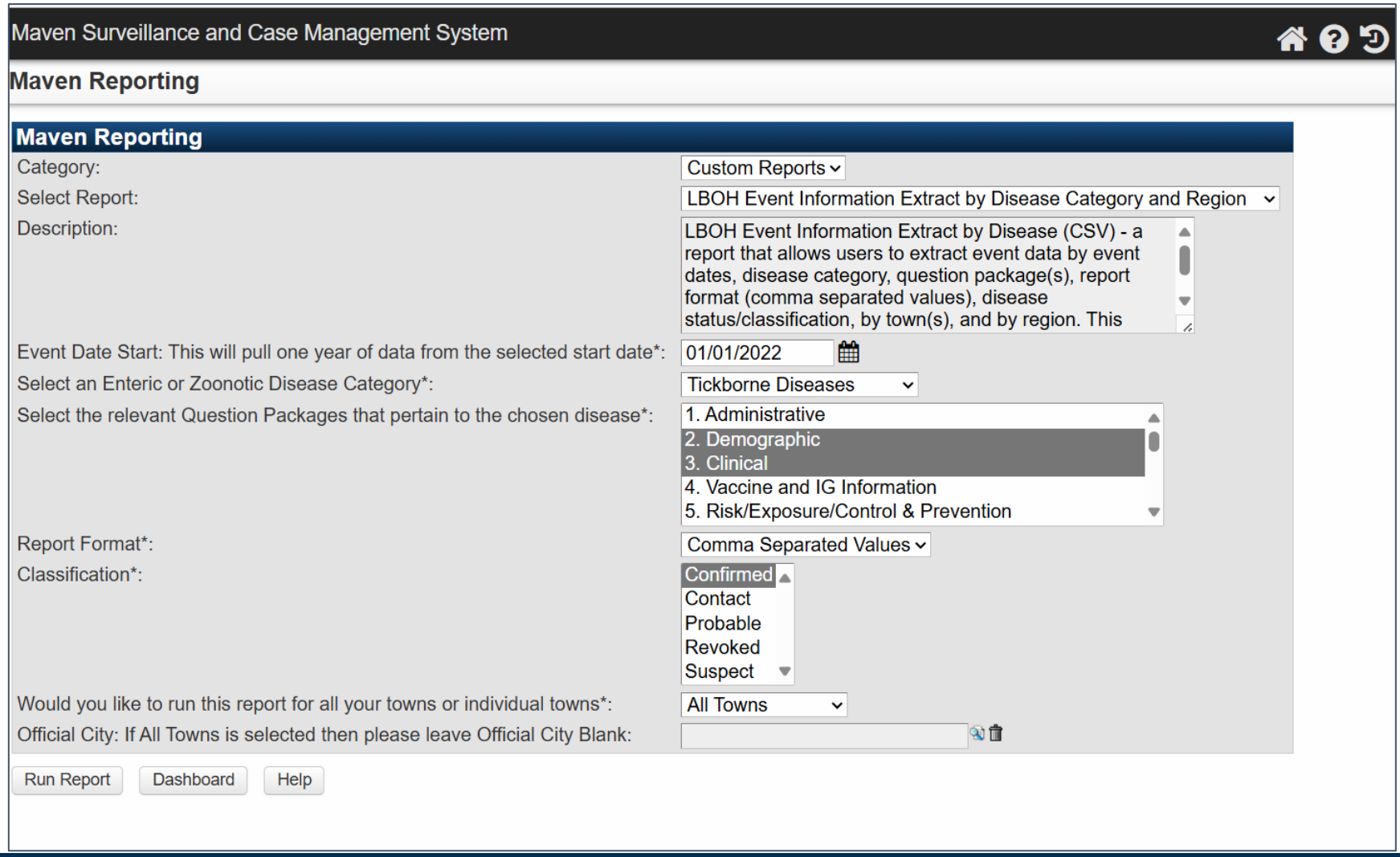
One of the Boards of Health Member concerned about increased tick-borne diseases in the last few years in the Metro-West region because of warmer seasons and changing eco-systems.

#Questions Raised

- How has the case count changed over time?
- What towns have the highest reported cases of tick-borne diseases?
- What percentage of cases required hospitalization?
- Which age groups and gender are most affected?
- What are the most common symptoms reported by affected individuals?

Data Accessibility: MAVEN

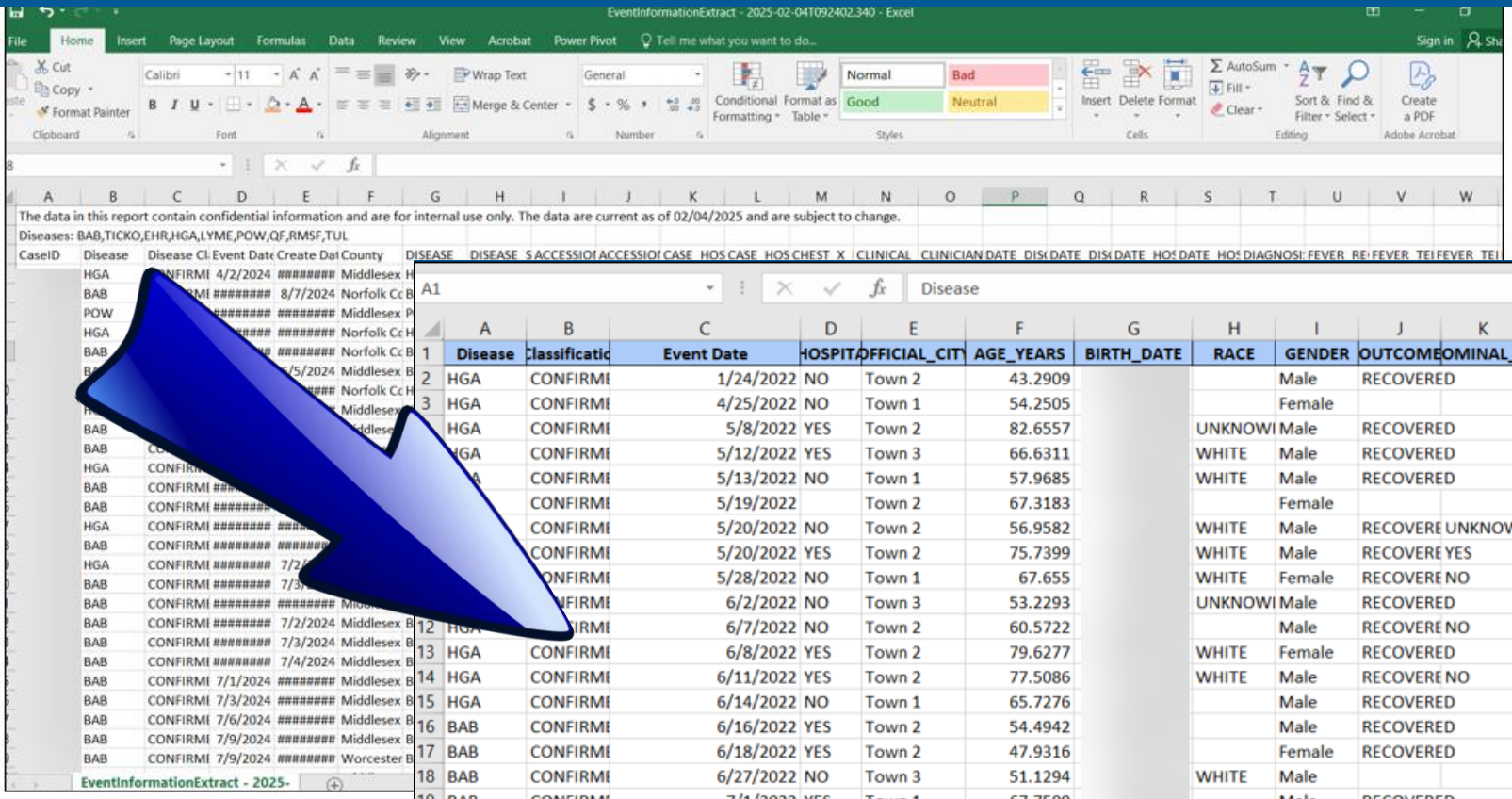
Report: LBOH Event Information Extract by Disease Category and Region

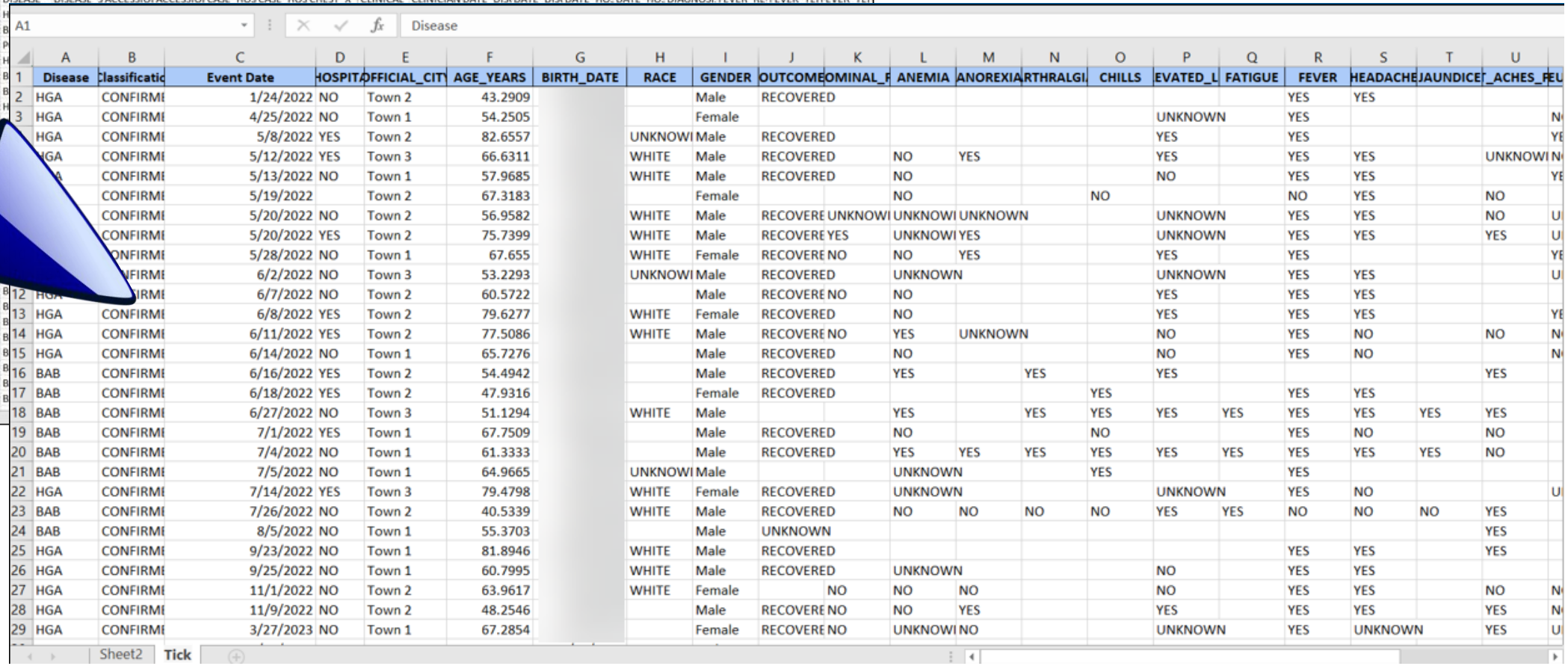


Understanding Raw Data And Data Cleaning

- Understand the Data Structure: What type of data is available?
  - Ex. Qualitative? Quantitative?
- Handle Missing Data
  - Ex. Replace missing values (blanks) with ‘UNKNOWN’
- Remove Duplicate Columns
  - Ex. Disease Classification Status and DISEASE STATUS, AGE_MONTHS and AGE_YEARS
- Rename Data Variables/Values
  - Ex. SS_FEVER = FEVER, BAB = Babesiosis

Understanding Raw Data and Cleaning Cont..





	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1	Disease	Classificatio	Event Date	HOSPITA	OFFICIAL_CITY	AGE_YEARS	BIRTH_DATE	RACE	GENDER	OUTCOME	OMINAL_F	ANEMIA	ANOREXIA	RTHRALGI	CHILLS	EVATED_L	FATIGUE	FEVER	HEADACHE	JAUNDICE	_ACHES_FE
2	HGA	CONFIRME	1/24/2022	NO	Town 2	43.2909			Male	RECOVERED								YES	YES		
3	HGA	CONFIRME	4/25/2022	NO	Town 1	54.2505			Female							UNKNOWN		YES			
4	HGA	CONFIRME	5/8/2022	YES	Town 2	82.6557		UNKNOWI	Male	RECOVERED						YES		YES			
5	HGA	CONFIRME	5/12/2022	YES	Town 3	66.6311		WHITE	Male	RECOVERED		NO	YES			YES		YES	YES		UNKNOWI
6	HGA	CONFIRME	5/13/2022	NO	Town 1	57.9685		WHITE	Male	RECOVERED		NO				NO		YES	YES		
7		CONFIRME	5/19/2022		Town 2	67.3183			Female			NO			NO			NO	YES		NO
8	HGA	CONFIRME	5/20/2022	NO	Town 2	56.9582		WHITE	Male	RECOVERE	UNKNOWI	UNKNOWI	UNKNOWN			UNKNOWN		YES	YES		NO
9	BAB	CONFIRME	5/20/2022	YES	Town 2	75.7399		WHITE	Male	RECOVERE	YES	UNKNOWI	YES			UNKNOWN		YES	YES		YES
10	HGA	CONFIRME	5/28/2022	NO	Town 1	67.655		WHITE	Female	RECOVERE	NO	NO	YES			YES		YES			
11	BAB	CONFIRME	6/2/2022	NO	Town 3	53.2293		UNKNOWI	Male	RECOVERED		UNKNOWN				UNKNOWN		YES	YES		
12			6/7/2022	NO	Town 2	60.5722			Male	RECOVERE	NO	NO				YES		YES	YES		
13	HGA	CONFIRME	6/8/2022	YES	Town 2	79.6277		WHITE	Female	RECOVERED		NO				YES		YES	YES		
14	HGA	CONFIRME	6/11/2022	YES	Town 2	77.5086		WHITE	Male	RECOVERE	NO	YES	UNKNOWN			NO		YES	NO		NO
15	HGA	CONFIRME	6/14/2022	NO	Town 1	65.7276			Male	RECOVERED		NO				NO		YES	NO		
16	BAB	CONFIRME	6/16/2022	YES	Town 2	54.4942			Male	RECOVERED		YES		YES		YES					YES
17	BAB	CONFIRME	6/18/2022	YES	Town 2	47.9316			Female	RECOVERED					YES			YES	YES		
18	BAB	CONFIRME	6/27/2022	NO	Town 3	51.1294		WHITE	Male			YES		YES	YES	YES	YES	YES	YES	YES	YES
19	BAB	CONFIRME	7/1/2022	YES	Town 1	67.7509			Male	RECOVERED		NO			NO			YES	NO		NO
20	BAB	CONFIRME	7/4/2022	NO	Town 1	61.3333			Male	RECOVERED		YES	YES	YES	YES	YES	YES	YES	YES	YES	NO
21	BAB	CONFIRME	7/5/2022	NO	Town 1	64.9665		UNKNOWI	Male			UNKNOWN			YES			YES			
22	HGA	CONFIRME	7/14/2022	YES	Town 3	79.4798		WHITE	Female	RECOVERED		UNKNOWN				UNKNOWN		YES	NO		
23	BAB	CONFIRME	7/26/2022	NO	Town 2	40.5339		WHITE	Male	RECOVERED		NO	NO	NO	NO	YES	YES	NO	NO	NO	YES
24	BAB	CONFIRME	8/5/2022	NO	Town 1	55.3703			Male	UNKNOWN											YES
25	HGA	CONFIRME	9/23/2022	NO	Town 1	81.8946		WHITE	Male	RECOVERED								YES	YES		YES
26	HGA	CONFIRME	9/25/2022	NO	Town 1	60.7995		WHITE	Male	RECOVERED		UNKNOWN				NO		YES	YES		
27	HGA	CONFIRME	11/1/2022	NO	Town 2	63.9617		WHITE	Female		NO	NO	NO			NO		YES	YES		NO
28	HGA	CONFIRME	11/9/2022	NO	Town 2	48.2546			Male	RECOVERE	NO	NO	YES			YES		YES	YES		YES
29	HGA	CONFIRME	3/27/2023	NO	Town 1	67.2854			Female	RECOVERE	NO	UNKNOWI	NO			UNKNOWN		YES	UNKNOWN		YES

Sheet2 Tick

*Data used in today's demonstration is dummy data

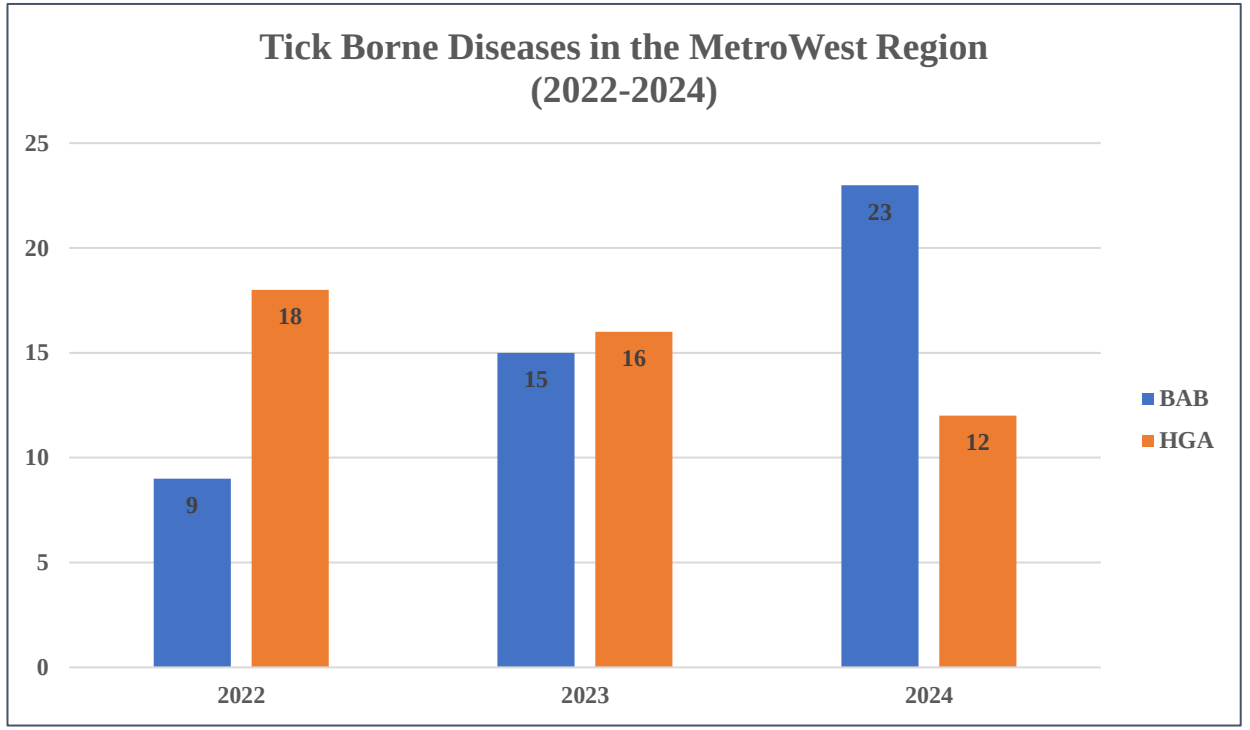
Pivot Table and Graph Demo

During this demo, we will..

- Epidemiological Analysis of Tick-Borne Disease Data by using Pivot Table
- Step-by-Step Walk Through
- Summarize Disease Trends by Year, Type of a Disease, Town
- Disease Breakdown by Demographics, Symptoms
- Address Missing Information

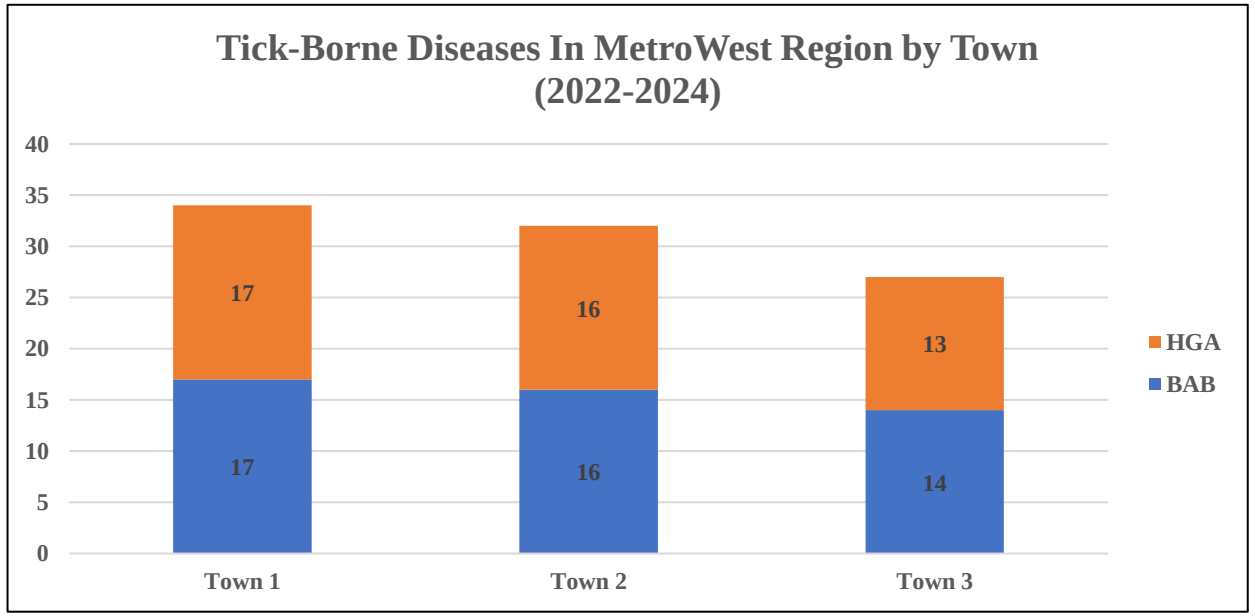
Pivot Chart and Graph Cont..

Count of Disease Classification Status	Column Labels		
Row Labels	BAB	HGA	Grand Total
2022	9	18	27
2023	15	16	31
2024	23	12	35
Grand Total	**47**	**46**	**93**



Pivot Table and Graph Cont..

Count of Disease Classification Status	Column Labels		
Row Labels	BAB	HGA	Grand Total
Town 1	17	17	34
Town 2	16	16	32
Town 3	14	13	27
Grand Total	**47**	**46**	**93**



Pivot Table Cont..

Demographics

Gender	Percent Distribution of GENDER
Female	37%
Male	63%
Grand Total	**100.00%**

Age Group	Percent Distribution
15-29 Yrs	2%
30-44 Yrs	13%
45-59 Yrs	19%
60-74 Yrs	47%
75-89 Yrs	18%
Grand Total	**100.00%**

Symptoms

Row Labels	Count of JAUNDICE
NO	15
UNKNOWN	63
YES	15
Grand Total	**93**

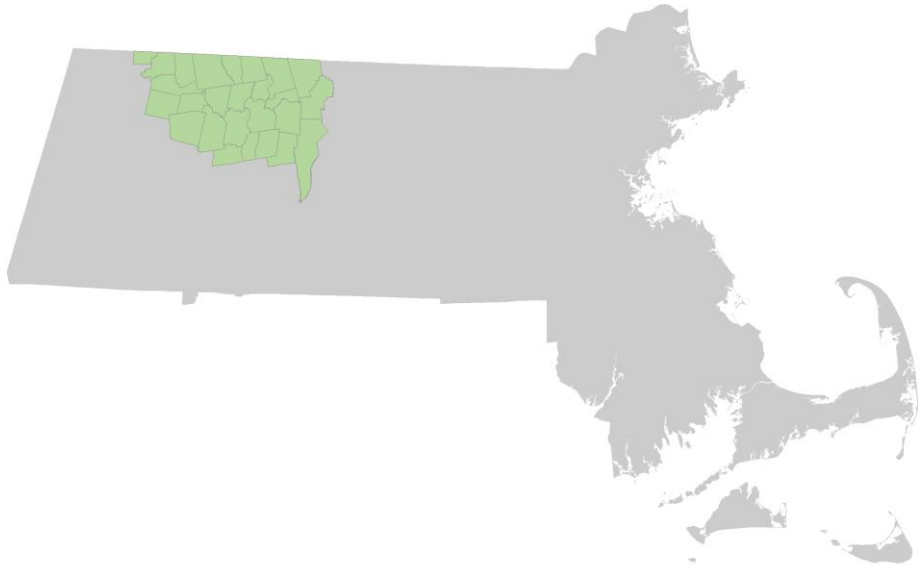
Row Labels	Count of JOINT_ACHES_PAINS
NO	17
UNKNOWN	49
YES	27
Grand Total	**93**

Raw Labels	Percent Distribution of FEVER
NO	11%
UNKNOWN	11%
YES	78%
Grand Total	**100.00%**

Raw Labels	Percent Distribution of HEADACHE
NO	25%
UNKNOWN	39%
YES	37%
Grand Total	**100.00%**

Maureen O’Reilly– Regional Epidemiologist

Public Health Scenario - Using Color Data to create a Vaccine Clinic Summary



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From vaccine clinic to summary report:

- Download raw data from **Color platform**
- Clean data
  - PivotTable for vaccines used; may be useful for administrative purposes
  - Remove duplicates
  - PivotTable for demographic information
- Create vaccine clinic summary with data
- Make sure PHI is deleted

Example: Vaccine clinic

You and your coworkers at Purple City Health Department just hosted a successful vaccine clinic!

How can you use PivotTables to create a summary like this one?

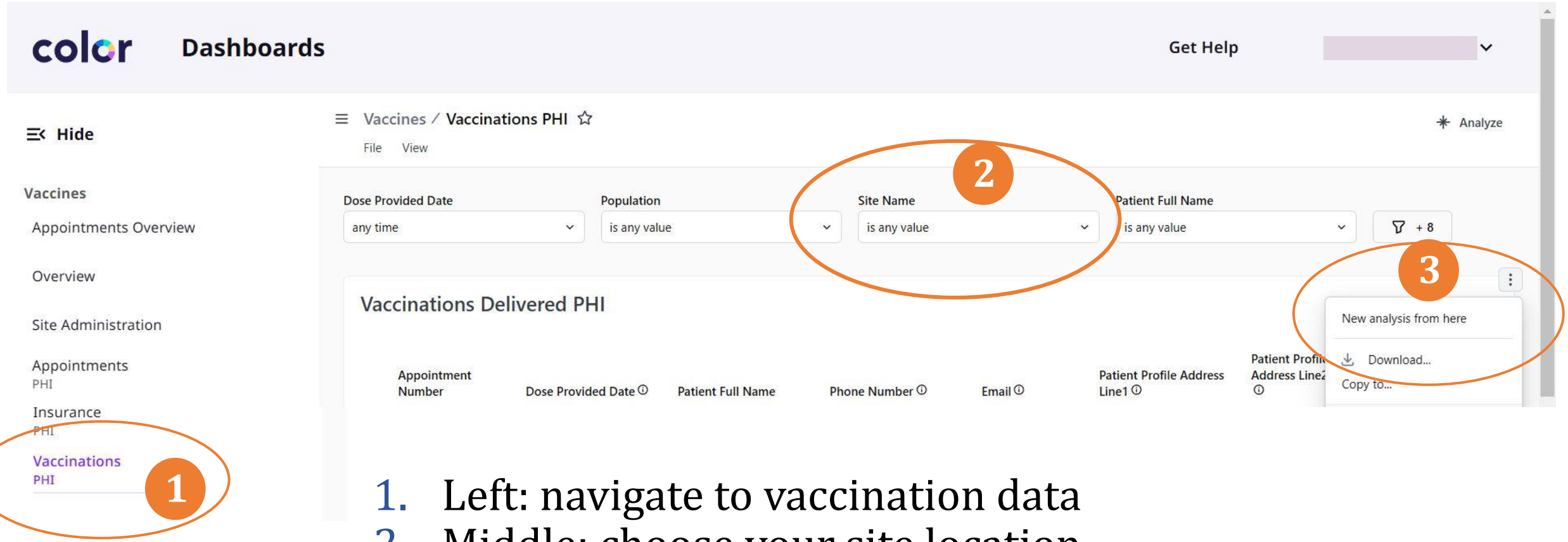
Purple City Health Dept.	31-Oct-24			
			Vaccine totals	
# people served	**101**		**flu doses total:**	65
# towns served	**4**			
Blueville	17		**COVID doses total:**	80
Yellow Town	22			
Purple City	56		**Total # doses:**	145
Green Hamlet	6			
			# people rec'd BOTH flu & COVID	44
Sex				
# females	55			
# males	46			
ages				
0 to 4 years old	9			
5 yrs to 11 yrs old	13			
12 yrs to 17 yrs	18			
>18	61			
aged 65 and older	25			
May be useful for health department administrative purposes				
insurance status		Reminder: Participants choose insurance information during registration; may not be totally accurate.		
no insurance	12			
insured	88			
# Medicare	25			
#MassHealth	15			

Color platform

- **Color** is a vaccine clinic management platform that is:
  - Currently used by MDPH, EMS, VNAs, Community Health Centers, school and health departments around the state to manage vaccine clinics (scheduling, registration, documentation)
  - MDPH provides this platform at no-cost to many of these organizations
  - Different than MIIS. Vaccine records created in Color are automatically transferred into MIIS

- MDPH has additional information if your health department is eligible to use Color at no-cost https://www.mass.gov/info-details/vaccine-clinic-management-platform

Extract raw data from Color



1. Left: navigate to vaccination data
2. Middle: choose your site location
3. Right: click on the three little dots to download the data

If you download the data in Excel, you can use PivotTable.

Color data: clean in Excel

1 Data cleaning checklist:

- Bold headers
- Delete columns you may not need (e.g. address, phone, email, dose #, administered amount, etc)
- Keep appointment number (shows duplicates): Person who receives both flu and COVID vaccines usually has same appointment number.

After part 1, PivotTable for vaccines administered

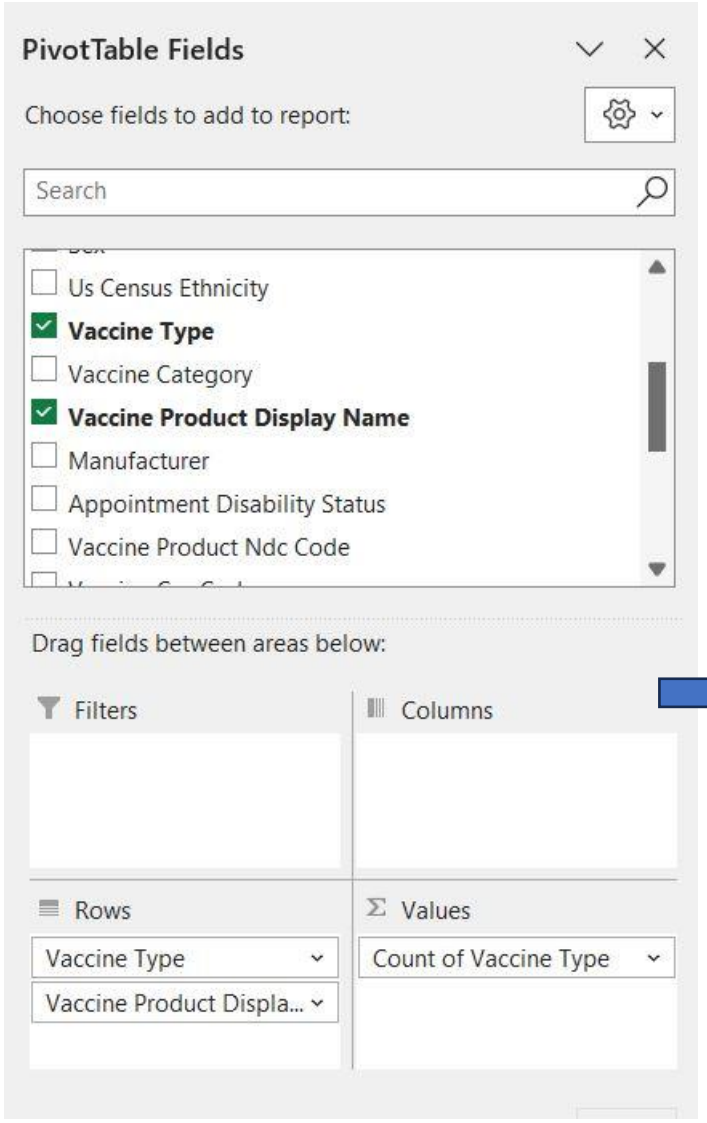
2 Remove duplicates by:

- Data tab: Sort by "Vaccine Type." Puts COVID vaccines on top, flu on bottom
- Change cell color for all information for people who got flu vaccines
- Home tab: Click "appointment number" column, go to "Conditional Formatting" then "Highlight Cell Rules" then "Duplicate Values" (duplicate cells now in red)
- Delete duplicate flu info (*left* click on row#)
- Restore "flu" column, then =countblank

After part 2, PivotTables for demographic information

Demo: Cleaning Color Data

PivotTable for vaccine information



1. After light cleaning and before removing duplicates, look at vaccine type (# flu, # COVID vaccines) and vaccine product information (which vaccines given out).

Row Labels	Count of Vaccine Type
COVID-19	**80**
COMIRNATY (COVID-19 Vaccine, mRNA, 2024-2025 Formula), no freeze formulation	27
Moderna COVID-19 Vaccine (2024-2025 Formula)	34
Spikevax SPIKEVAX (COVID-19 Vaccine, mRNA, 2024-2025 Formula)	19
Flu	**65**
Afluria	6
FLUAD	15
FluMist	18
FLUZONE TRIVALENT NORTHERN HEMISPHERE	26
Grand Total	**145**

Demographic PivotTable

2 After removing duplicates, use PivotTable to extract demographic information & put into vaccine clinic summary

Row Labels	Count of Patient Profile City
Blueville	17
Green Hamlet	6
Purple City	56
Yellow Town	22
(blank)	
Grand Total	**101**

Row Labels	Count of Sex
F	55
M	46
(blank)	
Grand Total	**101**

Row Labels	Count of Us Census Ethnicity
Asian	9
Black or African American	9
Hispanic	14
White	69
(blank)	
Grand Total	**101**

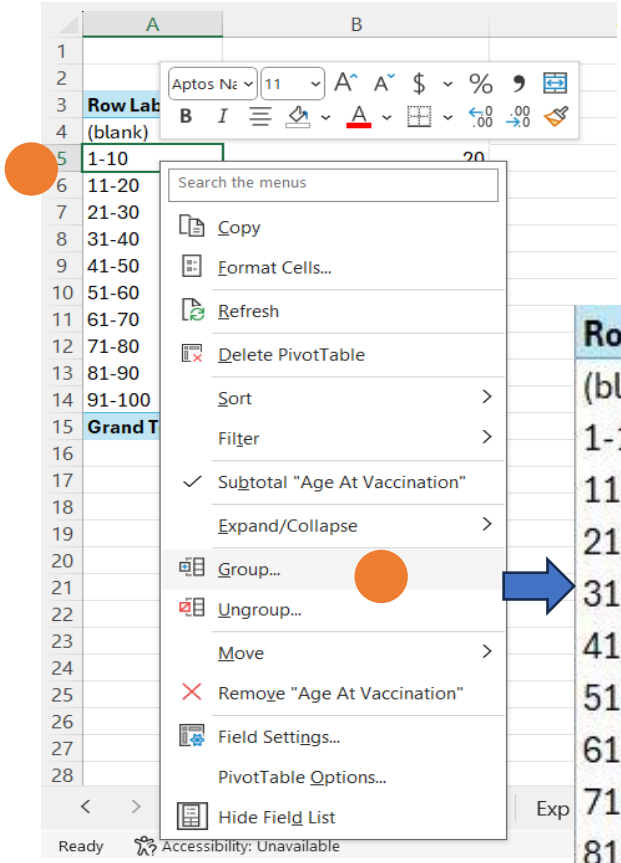
Row Labels	Count of Primary Insurance Insurance Type
commercial	53
medicaid	20
medicare	28
(blank)	
Grand Total	**101**

Purple City Health Dept.	**31-Oct-24**		
# people served	**101**	Vaccine totals	
# towns served	**4**	**flu doses total:**	65
Blueville	17		
Yellow Town	22	**COVID doses total:**	80
Purple City	56		
Green Hamlet	6	**Total # doses:**	145
		# people rec'd BOTH flu & COVID	44
Sex			
# females	55		
# males	46		
ages			
0 to 4 years old	9		
5 yrs to 11 yrs old	13		
12 yrs to 17 yrs	18		
>18	61		
aged 65 and older	25		
May be useful for health department administrative purposes			
insurance status		Reminder: Participants choose insurance	
no insurance	12	information during registration; may not be	
insured	88	totally accurate.	
# Medicare	25		
#MassHealth	15		

Extra directions: PivotTable and Age

PivotTable can make useful age groupings after deleting the duplicates:

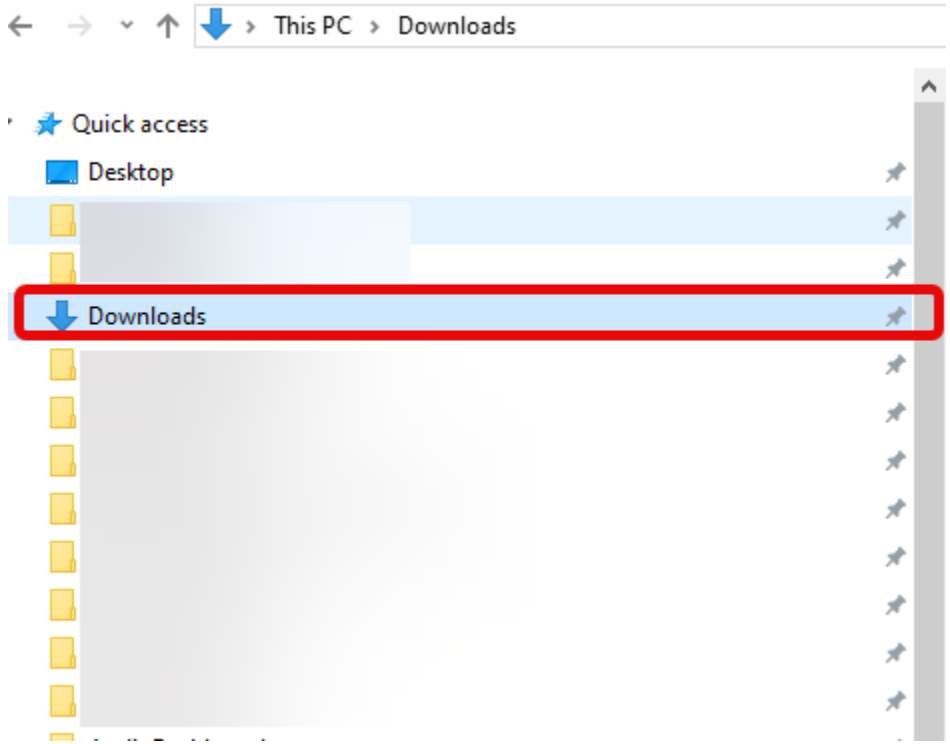
- Row: “Age” and Value “Count of Age at Vaccination”
- On resulting PivotTable, right click in the “Row” Column (leftmost column)
- Click on “group”
- In the next box, choose your desired age groups with “by”
  - Ex: “by” 10 (results at right)
- Repeat for additional groupings
  - by 17 gives younger than 18 category, by 64 gives an over 65 category



Row Labels	Count of Age At Vaccination
(blank)	
1-10	20
11-20	20
21-30	7
31-40	10
41-50	5
51-60	10
61-70	17
71-80	8
81-90	2
91-100	2
Grand Total	**101**

Final Step: Delete PHI

- Go to your downloaded files and **delete** those which contain protected health information (PHI)



Demo Report

Congrats!
Purple City Health Department hosted a successful clinic,
&
You saved a lot of time in creating a data summary and keeping track of vaccine information!

Purple City Health Dept.	31-Oct-24
# people served	**101**
# towns served	**4**
Blueville	17
Yellow Town	22
Purple City	56
Green Hamlet	6
Sex	
# females	55
# males	46
ages	
0 to 4 years old	9
5 yrs to 11 yrs old	13
12 yrs to 17 yrs	18
>18	61
aged 65 and older	25
May be useful for health department administrative purposes	
insurance status	
no insurance	12
insured	88
# Medicare	25
#MassHealth	15

Vaccine totals	
flu doses total:	65
COVID doses total:	80
Total # doses:	145
# people rec'd BOTH flu & COVID	44

Reminder: Participants choose insurance information during registration; may not be totally accurate.

Tips and Tricks

- Practice
- Play around – make a mistake click the undo button
- Add charts with PivotCharts
  - Once you have mastered PivotTables, you can move on to PivotCharts
  - Same format, windows, and basic functions as PivotTables
  - Fast way to make a chart

Pivot Table Resources

- Previous MAVEN Webinars
  - Beginner level introduction (7 minutes)
  - Intermediate session (1 hour and 5 minutes)
- Tip Sheet: Analyzing MAVEN data with PivotTables
- YouTube tutorials
  - Beginner level PivotTable tutorial (13 minutes)
- Microsoft documentation
  - Overview of PivotTables and PivotCharts
  - Create a PivotTable to analyze worksheet data
  - More advanced:
    - Create a PivotChart
    - Calculate values in a PivotTable
- This recording will be available on MAVEN Help soon.
- Use YouTube and Google to search for other tutorials and resources!