

2022 MUSE Inspire Conference

May 15-18 Gaylord Texan Resort & Convention Center | Dallas, TX



1007: Microsoft Power BI

Reporting from Data Repository

May 16, 2:30-3:25

Presenter: Ian Proffer





Welcome back! Come see our other sessions this year:

Day	Date	Time	Session
Sunday	May 15	9:30-12:00	701 - Power BI Fundamentals
			703 - MIPS: Don't Let it Sink Your Ship
		1:00 - 3:30	801 - Developing for DR with Power BI
Monday	May 16	2:30-3:25	1007 - Power BI and DR
Tuesday	May 17	10:00-10:55	1062 - Improve Quality Performance
Wednesday	May 18	10:00-10:55	1057 - Microsoft's Power Platform (Northeastern VT)
		11:00-11:55	1097 - OR Utilization Analysis (Northwestern Medical Center)



Our Agenda

- > What is Power BI?
- > Using Power BI with DR
- > Real-world examples of Power BI reports



What is Power BI?

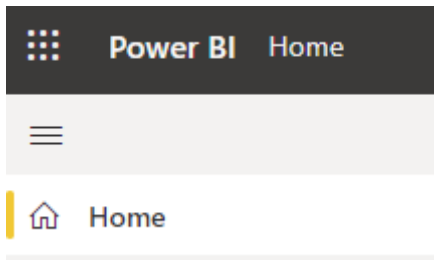
- > **Power BI** is a collection of software services, apps, and connectors that work together to turn your unrelated sources of data into coherent, visually immersive, and interactive insights. Power BI lets you easily connect to your data sources, visualize and discover what's important, and share that with anyone or everyone you want.
- > <https://docs.microsoft.com/en-us/power-bi/fundamentals/power-bi-overview>



What is Power BI?



- > A Windows desktop application called **Power BI Desktop**
- > An online SaaS (Software as a Service) service called the **Power BI service**
- > Power BI mobile apps for Windows, iOS, and Android devices



Other elements of Power BI

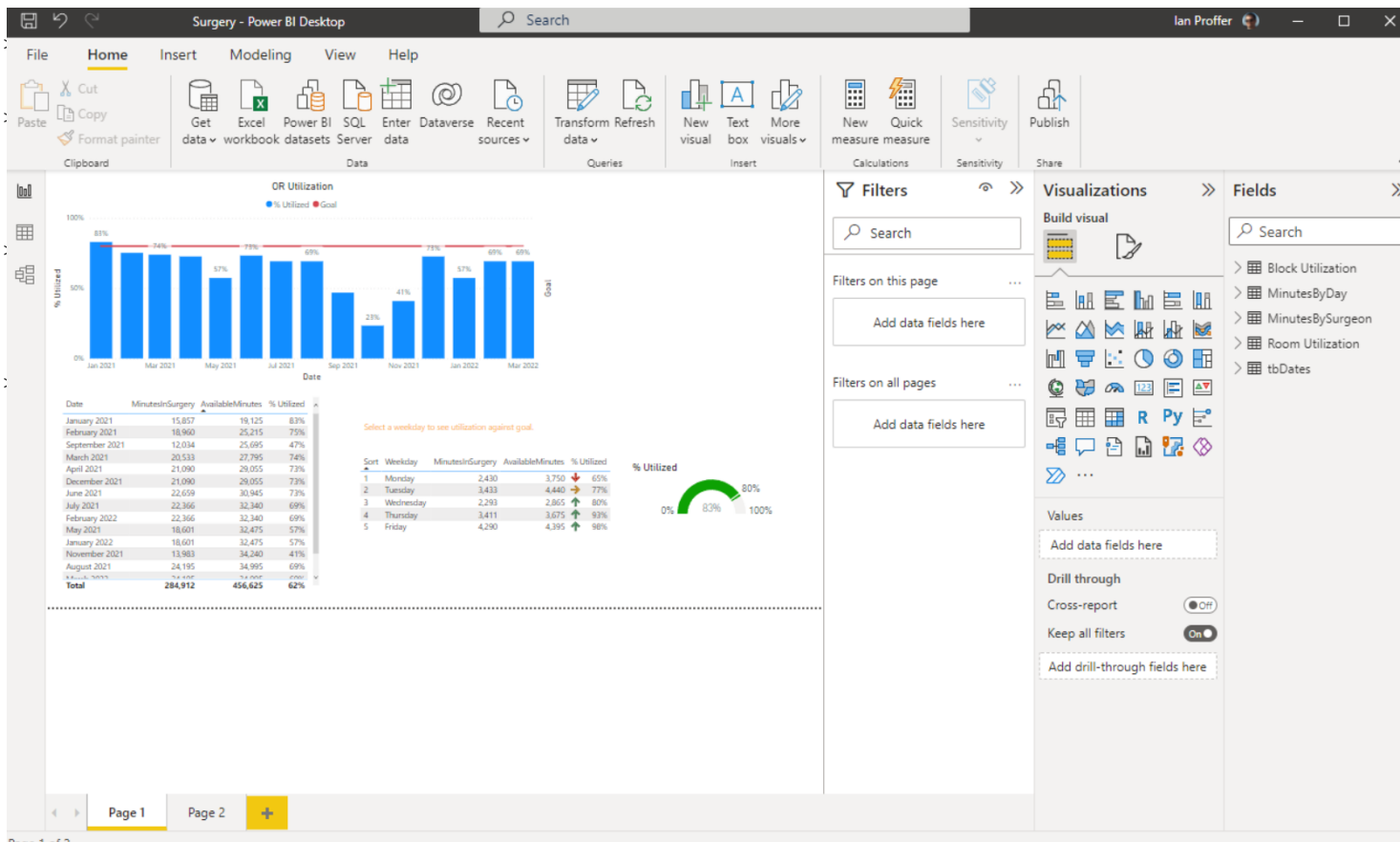
- > **Power BI Report Builder**, for creating paginated reports to share in the Power BI service
- > **Power BI Report Server**, an on-premises report server where you can publish your Power BI reports, after creating them in Power BI Desktop



Power BI Desktop

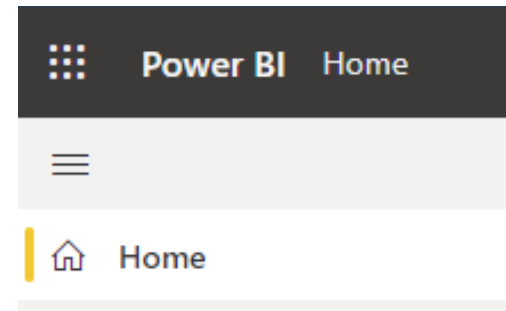
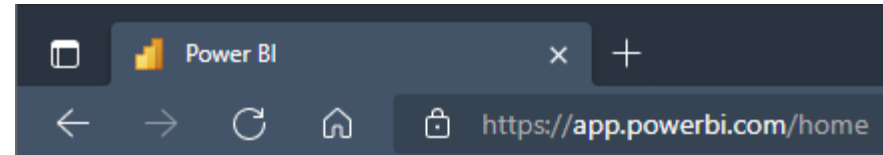


- > A free desktop application that lets you connect to, transform, and visualize your data.



Power BI service

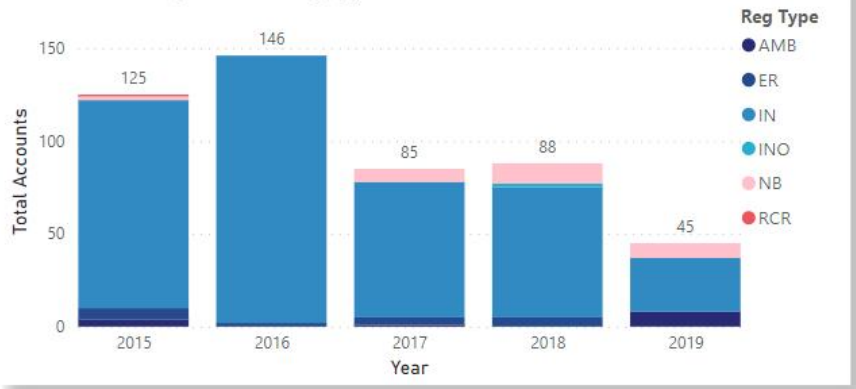
- > Where you publish dashboards and share them across your organization. Dashboards and reports connect to datasets that bring all the relevant data together in one place.
- > The service has some report creation abilities too but is more limited than Power BI Desktop.



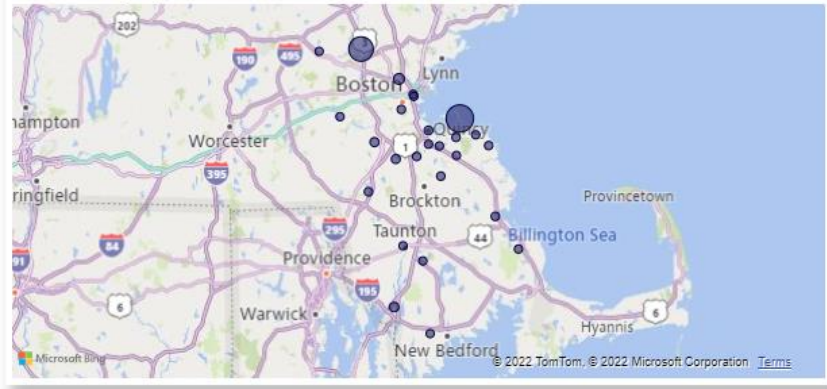
Patients by Diagnosis and Zip Code



Total Accounts by Year and RegType



Accounts by ZipCode



Top 5 Diagnoses

Dx Code	2015	2016	2017	2018	2019	Total
410		36				36
Acute myocardial infarction of anterolateral wall, episode of care unspecified		36				36
433.01		44				44
I48.91	17		17	25	10	69
I63.00	13	2	25	30	17	87
Z38.00		4	5	11	8	28
Total	18	86	34	53	29	220

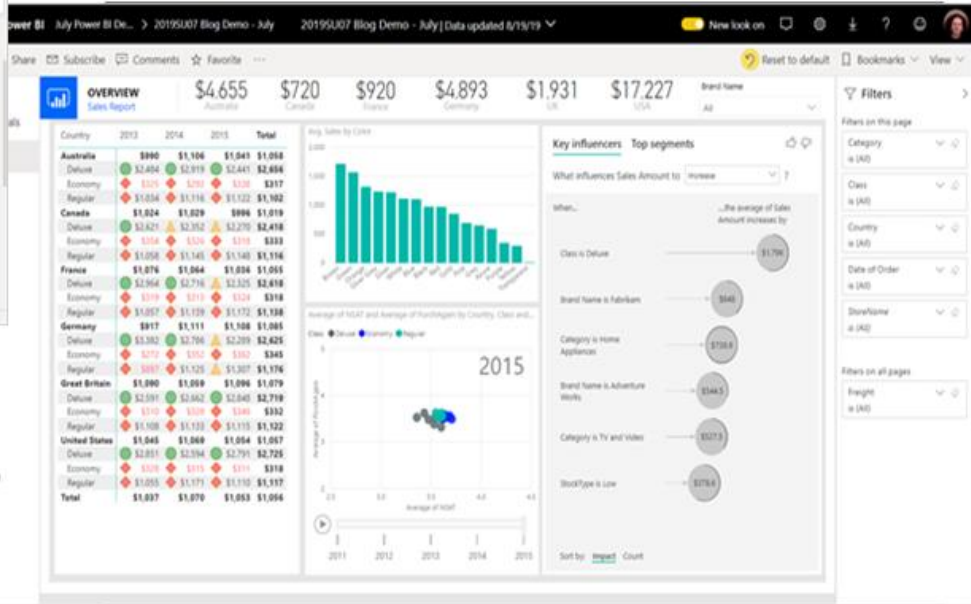


Working with Power BI

Power BI Desktop



Power BI service



Power BI Mobile



Wait...what about SSRS?

- › What's up with SQL Server Reporting Services? (SQL Server Data Tools/Visual Studio and the Report Manager/Report Server/web portal)

The screenshot displays the Microsoft Visual Studio interface for developing an SSRS report. The main window shows the design view of a report titled "Average Census by...of Day.rdl". The report includes a header with the AcmeWare logo, a report name placeholder, and date range filters. A data table is visible with columns for "Hour of Day" and "Census". A yellow bar chart is plotted on the table, showing the average census for each hour. The Solution Explorer on the right lists the project structure, including shared data sources, datasets, and reports. The Properties window at the bottom right shows the configuration for a chart control.

Report Design Elements:

- Header: AcmeWare logo, [ExecutionTime], [ReportName]
- Filters: [StartDate], [EndDate]
- Data Table:

Hour of Day	Census
<Expr>	[Avg(Censi
- Chart: A yellow bar chart representing the average census for each hour.

Properties Window (chart1 Chart):

DocumentMapLabel	
DynamicHeight	
DynamicWidth	
Filters	
Hidden	False
HideUpdateNotifications	False
LabelLocID	
Language	
Legends	(Collection)
Location	2.25in, 0.61111in
Name	chart1

Name
Specifies the name of the report item.



Power BI Report Builder

- > A standalone desktop application for designing and publishing *paginated* reports to the Power BI server. Surprise, it's the rebranded "Microsoft Report Builder."
- > <https://docs.microsoft.com/en-us/power-bi/paginated-reports/report-builder-power-bi>

The screenshot displays the Power BI Report Builder interface for a report titled "COVID-19 Dashboard.rdl". The interface includes a ribbon with tabs for File, Home, Data, Insert, and View. The Home tab is active, showing options for Run, Paste, Font, Paragraph, Border, Number, Merge, Split, Align, Layout, and Share. A "Report Data" pane on the left lists data sources like "CovidTrackingDB" and "Datasets". The main report area features a blue header with "[Report Title]" and "Data Last Updated: [LastUpdateDtr]". Below the header are two gauge charts: "Bed Occupancy Rate" (0-100) and "Ventilator Use Rate" (0-100). A bar chart titled "COVID-19 Cases" shows data for "Month Day A" through "Month Day F". To the right, a table titled "Facility COVID-19 Patient Data" displays overall cases, outcomes, and lab tests. Below that is a table titled "Current Patient Census" with columns for Pts, Beds, Occ Rate, Has COVID-19, and Has COVID Indica.

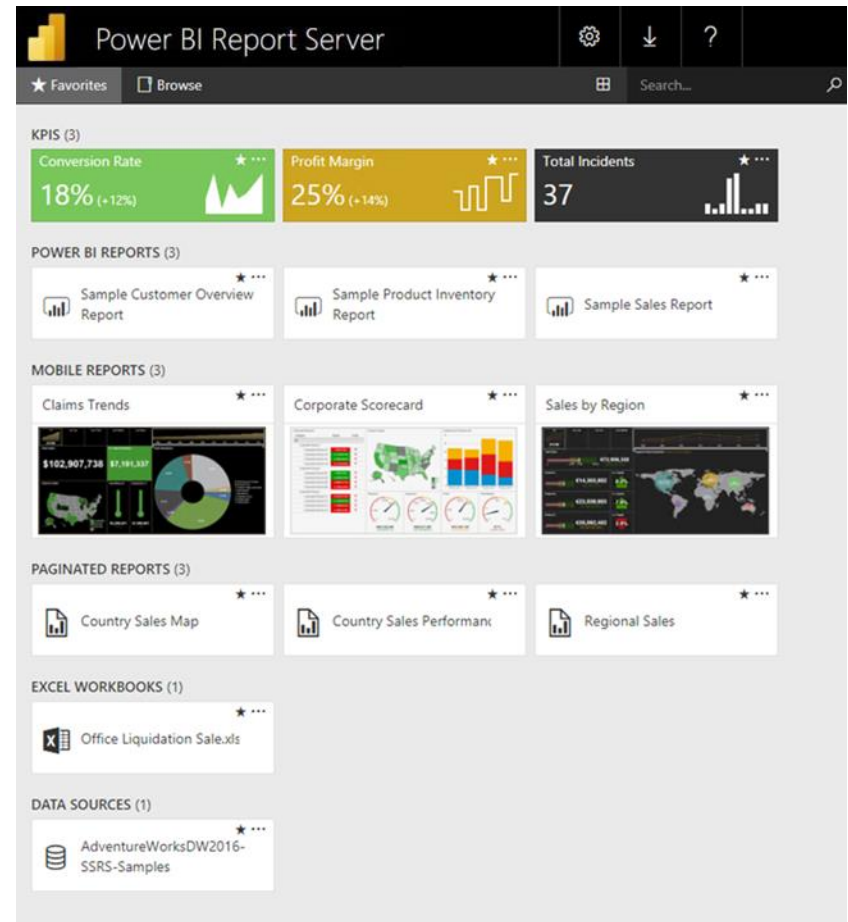
Overall Cases	Recovered	Exp
[Overall_Covid19CaseCnt]	[Covid19Recovered]	[Covid19Exp]
Lab Tests Performed	Negative	Pos
[CovidLabTestPerformed]	[CovidLabNegat]	[CovidLabPos]

Location	Pts	Beds	Occ Rate	Has COVID-19	Has COVID Indica
Total	[Total_Pts]	[Total_Beds]	[Total_OccRate]	[Total_Census]	[Total_Indica]
Location	ionTvn	BedCnt	OccRate	Tvno	Census
[LocationName]	[ion_Ce]	[BedCnt]	[OccRate]	[CensusWit]	[usWit]

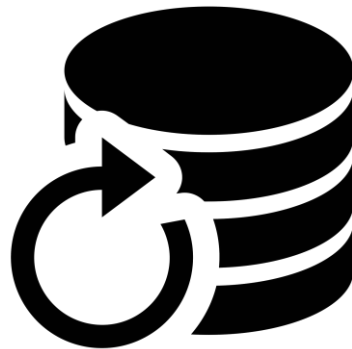


Power BI Report Server

- > Power BI Report Server is an on-premises report server with a web portal in which you display and manage reports and KPIs. Along with it come the tools to create Power BI reports, paginated reports, mobile reports, and KPIs.

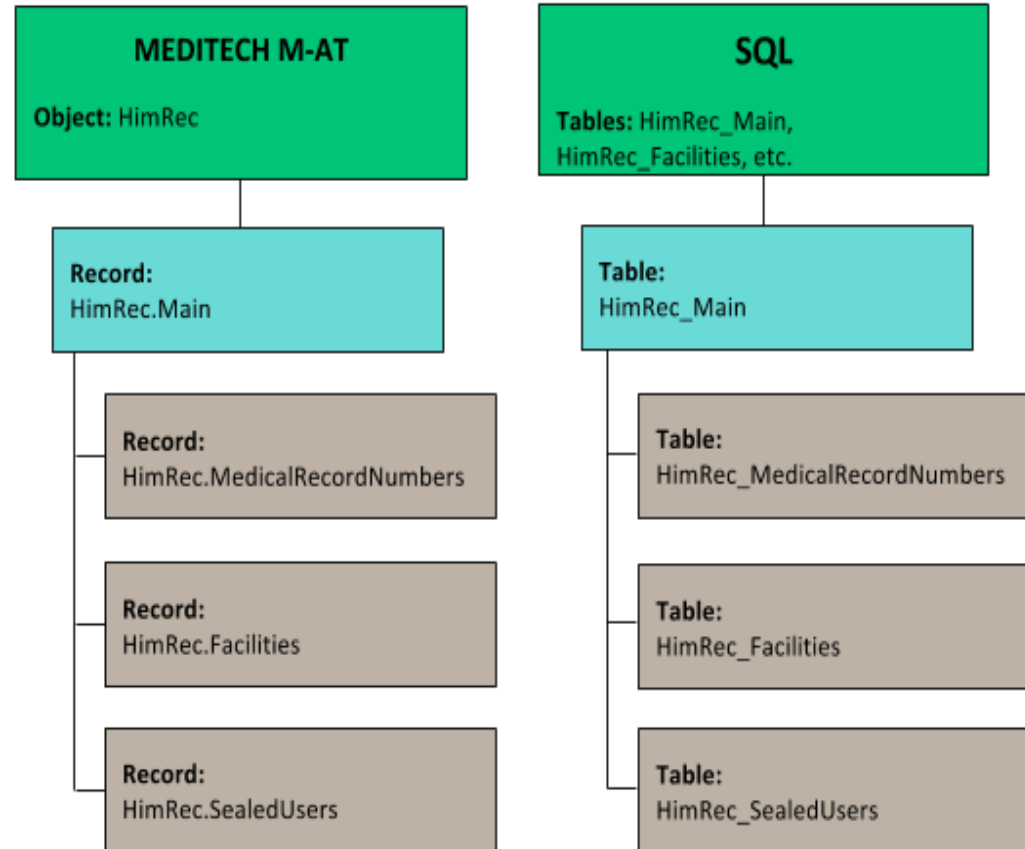


Using Power BI with DR



Review of DR design

- > Power BI expects relational data sources to be normalized - the DR is not.
- > The DR table schema is hierarchical like MT and lacks foreign keys, making it challenging for report development and data model design.



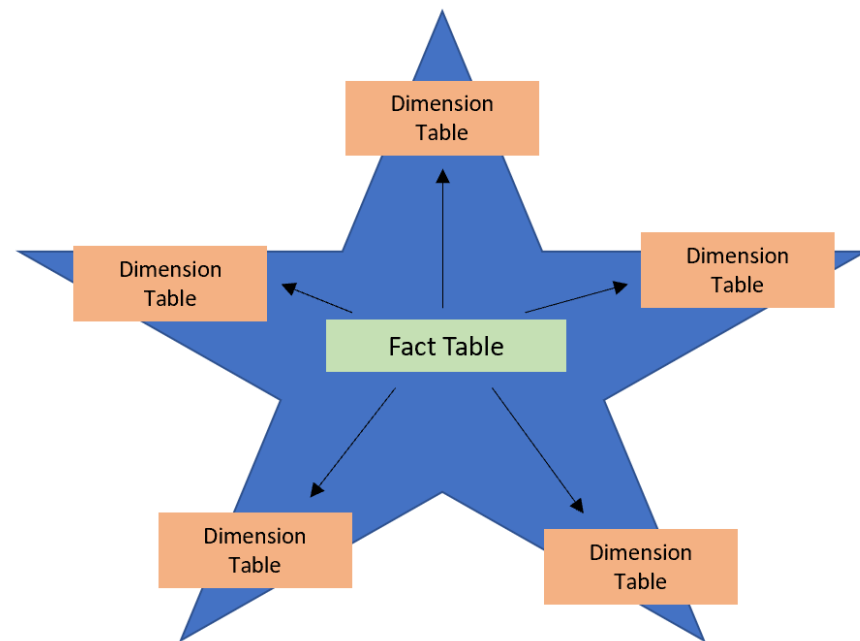
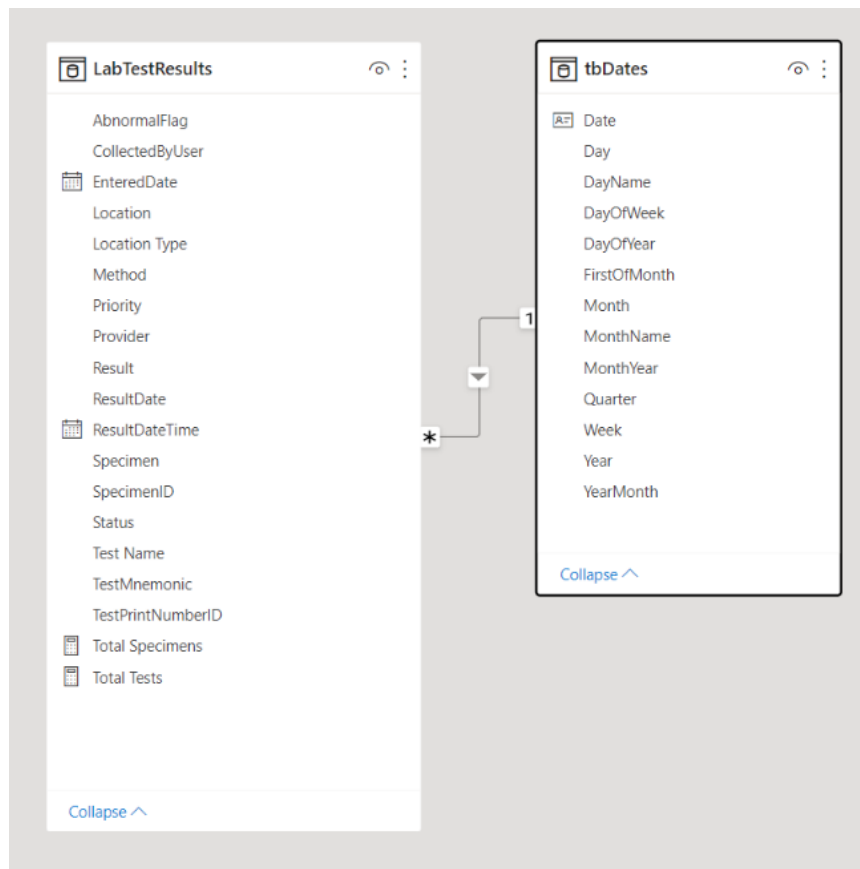
Considerations for DR



- > Data model: “flat” or star schema?
- > Connectivity: Import or DirectQuery?
- > SQL coding: views, stored procedures, or embedded expressions?
- > Power BI Gateway needed to connect to DR server
- > Report data refresh needs to be scheduled

The data model

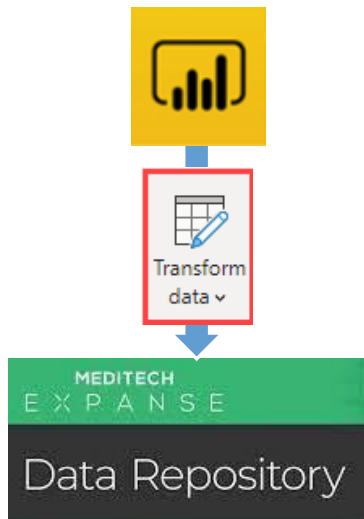
- > Should the data be “flat,” like a single table or dataset, or based on a star-schema?



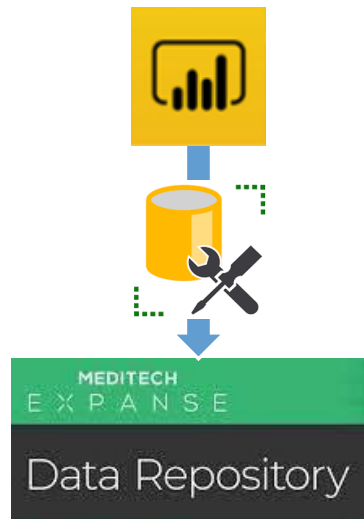
Accessing DR data with Power BI

How you choose to use Power BI with the DR is highly dependent on the Power BI developer's knowledge of the MEDITECH DR system!

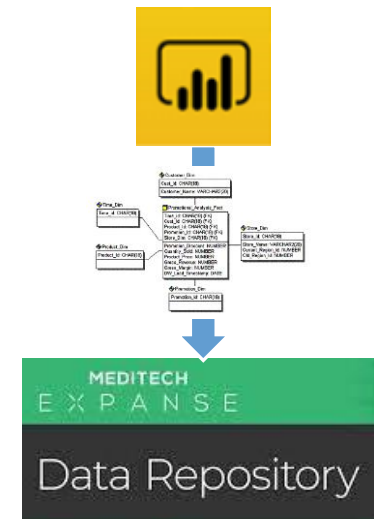
Direct to DR tables (No)



Via SQL object (Yes)



Via data model (Yes)



Getting data from SQL Server

Import

- > Data cached on desktop and in Power BI service
- > 1 GB limit for non-premium
- > Data is compressed for efficiency
- > Full use of DAX (data access expressions) function library
- > Data sources require periodic refresh

DirectQuery

- > Always uses current data
- > Scalable, no 1GB limitation
- > Significantly slower than data import mode
- > Cannot combine data in Power Query
- > Many DAX functions unavailable

Using SQL programming objects



> Views (i.e., virtual tables)



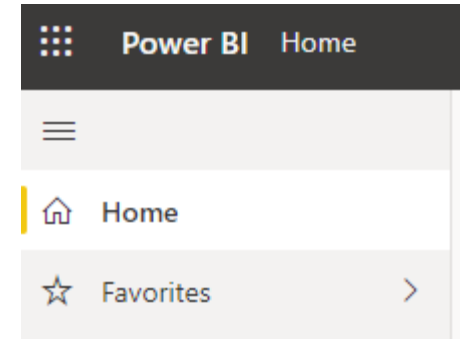
> Stored procedures

```
SELECT
    Name,
    AccountNumber,
    Facility,
    Location,
FROM AdmVisits|
```

> Embedded queries

Power BI online - user experience

- > Workspaces
 - > share the ownership and management of dashboards, reports, and datasets
 - > Use roles to determine permissions (manage, edit, view)
- > Apps
 - > Package related workspace content (dashboards, reports, and datasets)
 - > Can use workspace permissions or be different
- > Dashboards
 - > Single-page canvas of tiles used to “tell the story”



Demo: Power BI online

https://www.powerbi.com/home

Power BI Home

Good afternoon, Ian

Find and share actionable insights to make data-driven decisions

Recommended

- You frequently open this: My workspace
- You favorited this: Power BI Demo Reports
- You frequently open this: Lab Tests

Recent Favorites My apps

	Name	Type	Opened	Location
	BAR Summary and Detail	Report	22 hours ago	My workspace
	Lab Tests	Report	a day ago	My workspace
	My workspace	Workspace	a day ago	Workspaces
	Patients by Diagnosis	Report	a day ago	My workspace



Questions and discussion



- > About the Power BI applications and services
- > About using Power BI with Data Repository

Report Demo: Dan Deatrck

3/5/2020 12/22/2021

Location

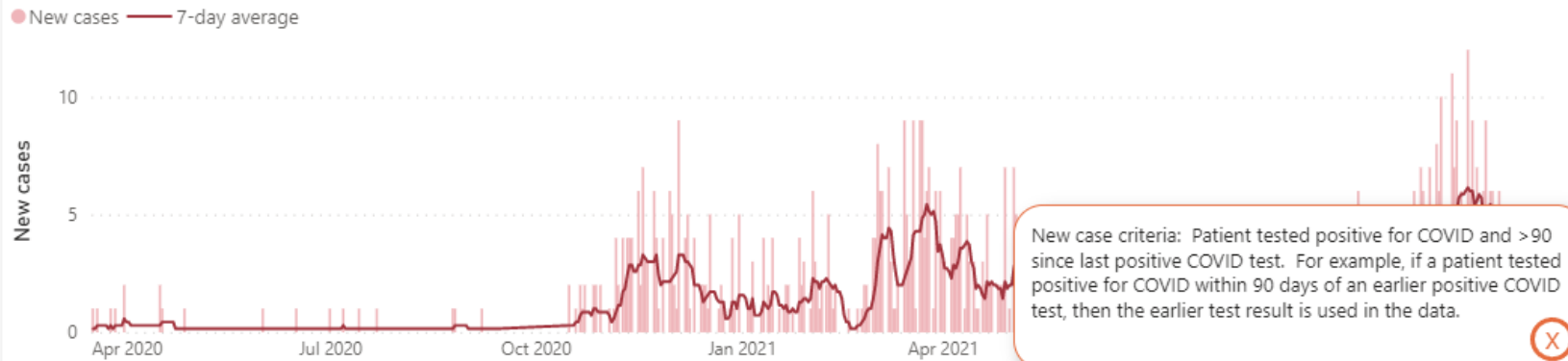
- ICU
- MS
- Out Pt

Age

All

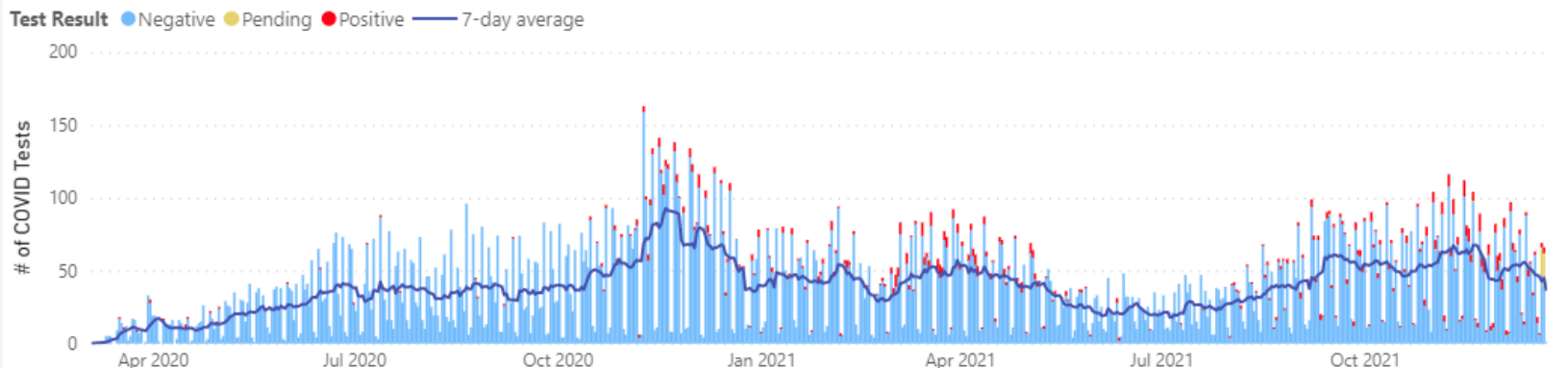
Date	New Cases
Dec 2021	62
Nov 2021	157
Oct 2021	54
Sep 2021	63
Aug 2021	30
Jul 2021	2
Jun 2021	5
May 2021	34
Apr 2021	72
Mar 2021	120
Feb 2021	35
Jan 2021	22
Total	826

New Positive COVID Cases by Date



Date	# of Tests
Dec 2021	1,055
Nov 2021	1,797
Oct 2021	1,559
Sep 2021	1,624
Aug 2021	1,083
Jul 2021	756
Jun 2021	671
May 2021	897
Apr 2021	1,373
Mar 2021	1,540
Feb 2021	1,127
Jan 2021	1,286
Total	25,815

COVID Test Volume by Date



Open discussion

- > What questions do you have?



Microsoft Power BI



Keep in touch!

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Our website: <https://acmeware.com>