



701: Microsoft Power BI Fundamentals

Presented by: Ian Proffer and Dan Deatricks
Sunday, May 15, 9:30-12:00

2022 MUSE Inspire Conference

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



Welcome back! Come see our education sessions:

Day	Date	Time	Room	Session
Monday	May 16	2:30-3:25	Grapevine 6	1007 - Power BI and DR
Tuesday	May 17	10:00-10:55	Austin 4	1062 - Improve Quality Performance
Wednesday	May 18	10:00-10:55	Austin 4	1057 - Microsoft's Power Platform (Northeastern VT)
		11:00-11:55	Grapevine 6	1097 - OR Utilization Analysis (Northwestern Medical Center)



Our Agenda

- > Overview of Power BI applications and services
- > Power BI Desktop and Power BI service
- > Report design in detail
- > Hands-on: build a report
- > Sharing reports with the PBI service
- > Discussion and wrap-up



Introductions



- > A little about me and Acmeaware
- > A little about you
 - > Your role working with MEDITECH
 - > Your reporting experience



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>

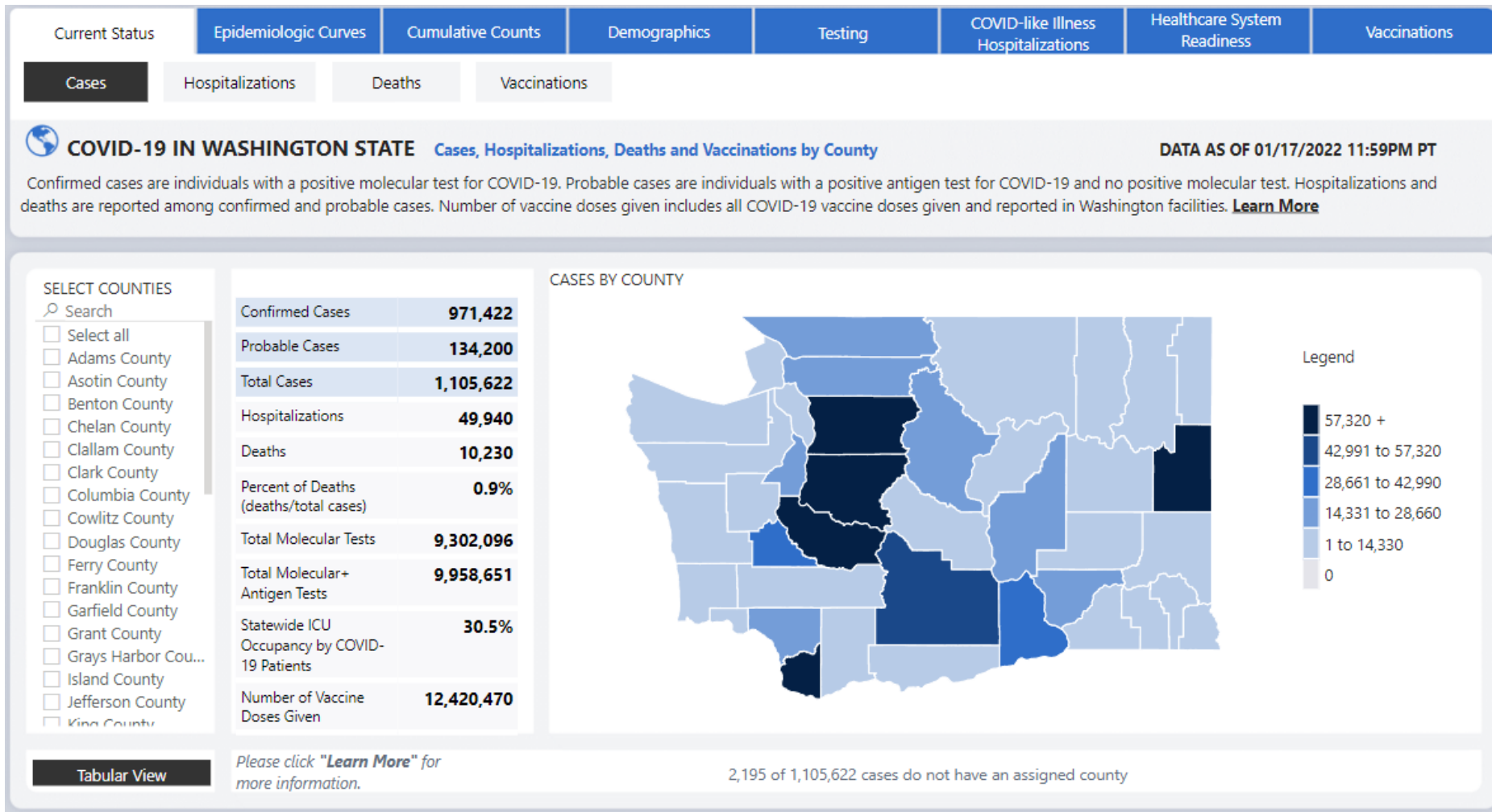


History of Power BI

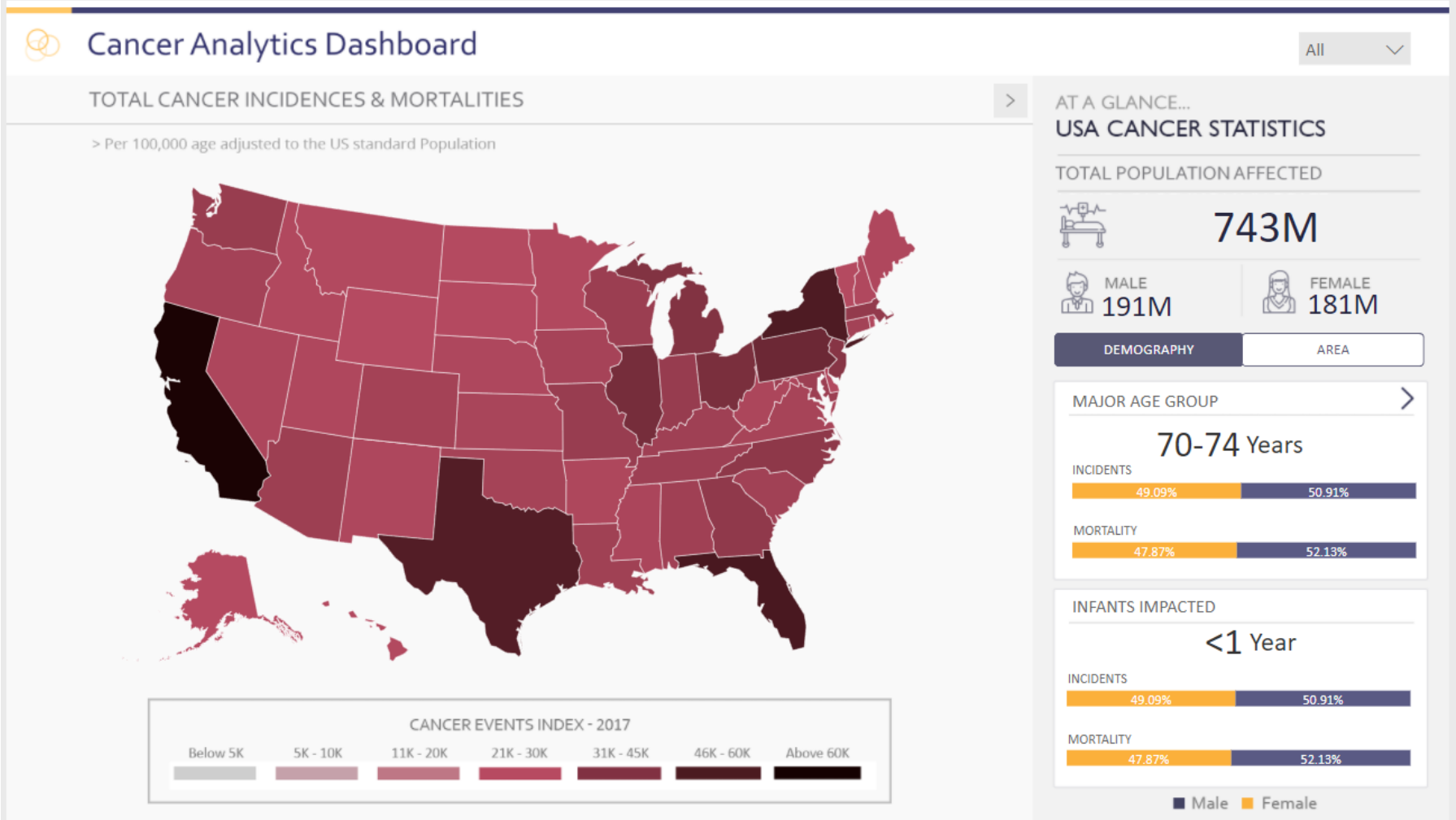
- > Initially conceived by SSRS team in 2010
- > Power BI for Office 365 in 2013
 - > Based on Excel Power Query, Power Pivot and Power View
 - > Shift to cloud-based analytics and visuals in 2015



Power BI in Healthcare



Power BI in Healthcare

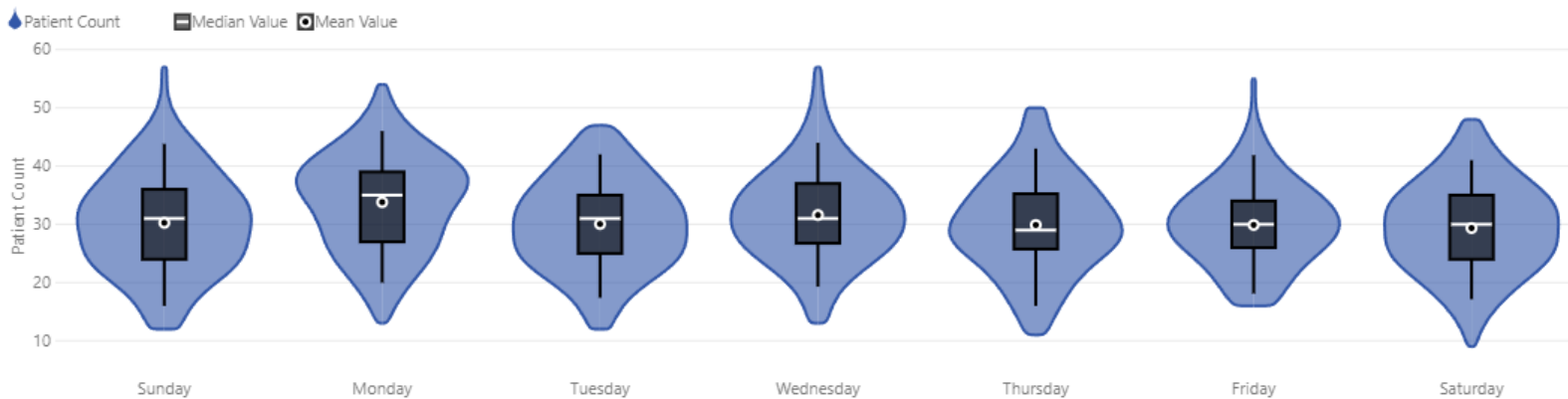


Power BI in Healthcare

12/22/2019 12/22/2021

Day of Week
All

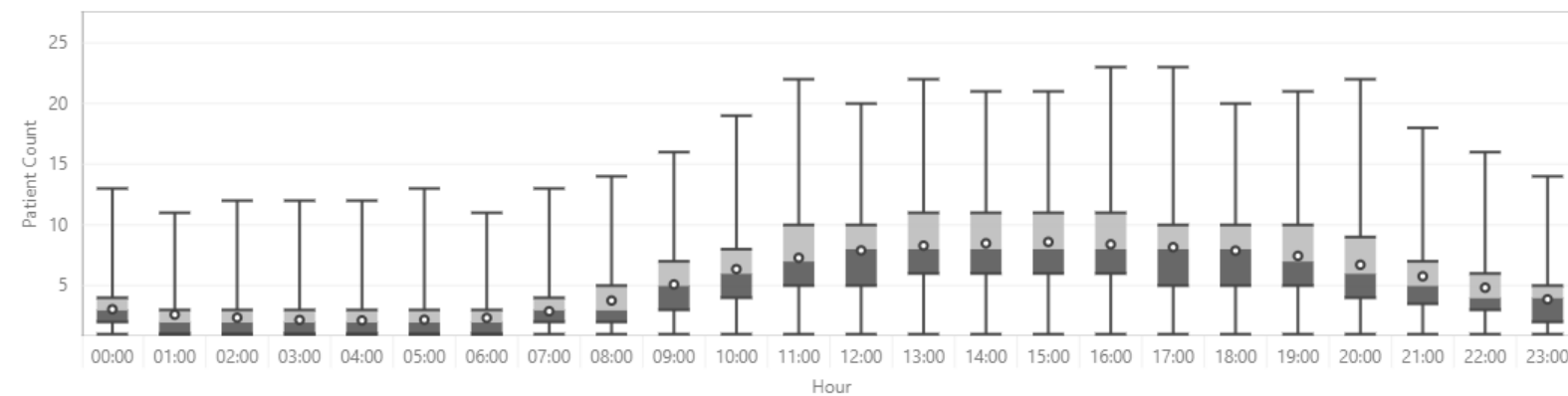
Patient Registrations by Day



Registrations by Day

Day	Avg	Range
Sunday	30	22-39
Monday	34	26-42
Tuesday	30	22-38
Wednesday	32	24-40
Thursday	30	22-38
Friday	30	23-37
Saturday	29	22-37
Total	31	23-39

Patient Volume by Hour



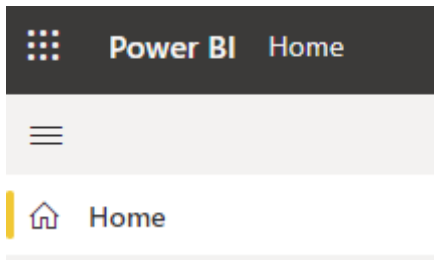
Patient Volume by Hour

Hour	Avg	Range
00:00	3	1-5
01:00	3	1-4
02:00	2	1-4
03:00	2	1-3
04:00	2	1-3
05:00	2	1-4
06:00	2	1-4
07:00	3	1-5
08:00	4	2-6
09:00	5	3-8
10:00	6	3-9
11:00	7	4-11

Power BI apps and services



- > 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



Power BI apps and services

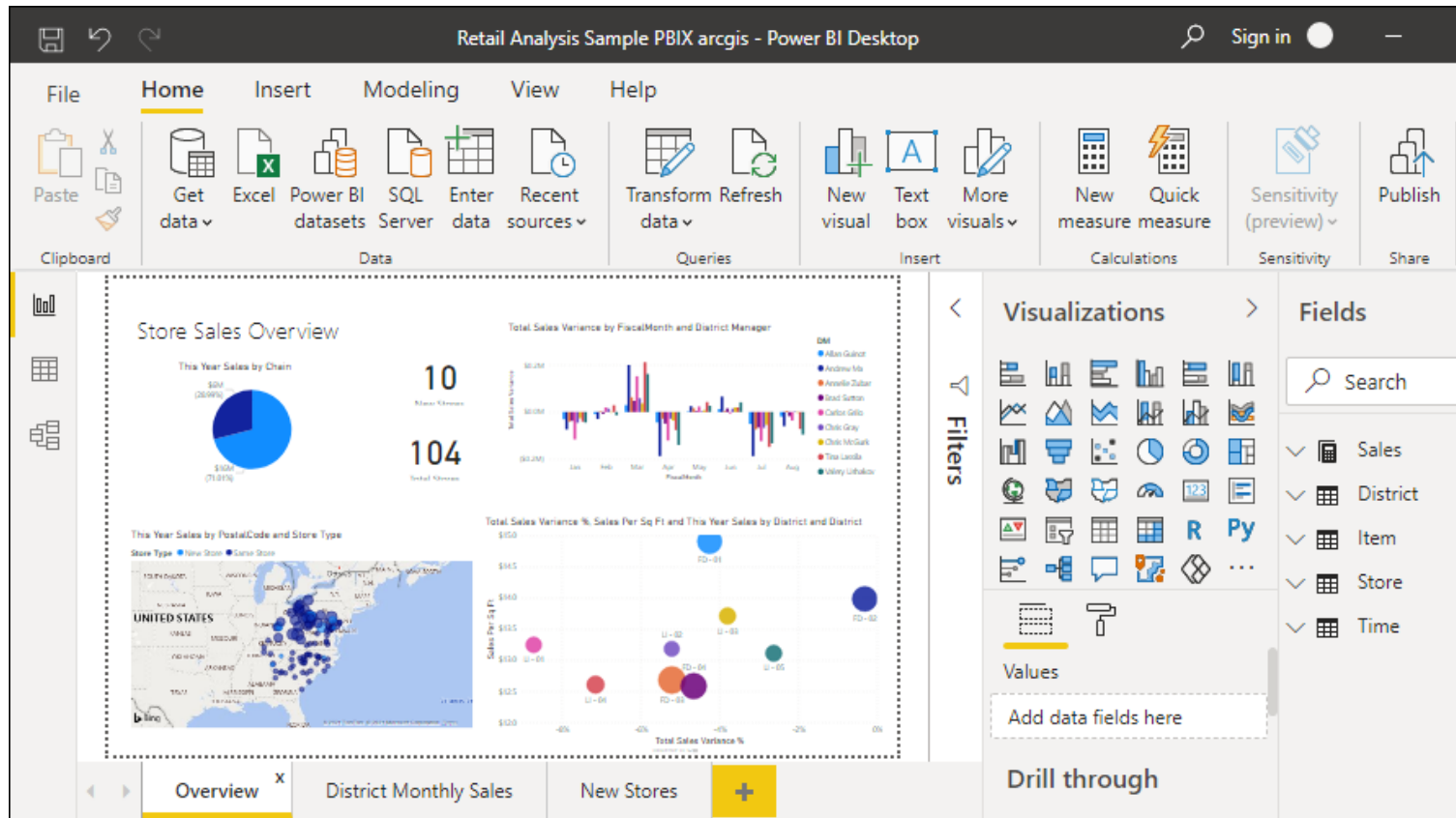
- > **Power BI Report Builder**, for creating paginated reports to share in the Power BI service
- > **Power BI Report Server**, an on-premises report server where you can publish your Power BI reports, after creating them in Power BI Desktop



Power BI Desktop

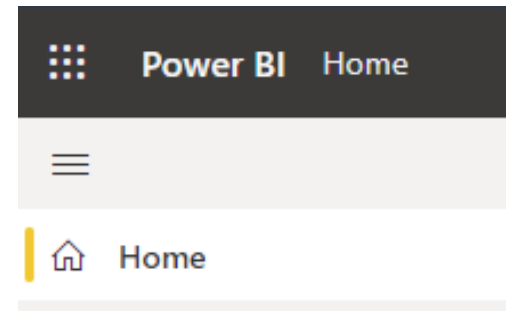
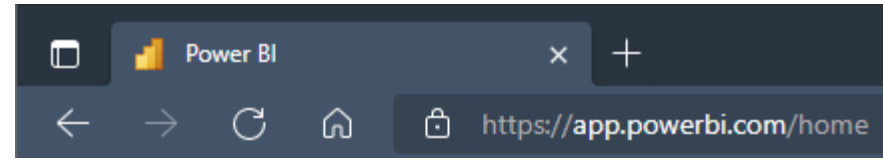


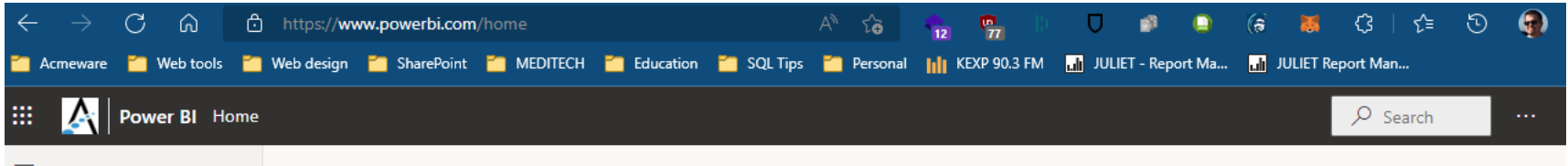
- > A free desktop application that lets you connect to, transform, and visualize your data.



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.





Select measure(s)

- FUH
- HBIPS-2
- HBIPS-3
- HBIPS-5
- IMM-2

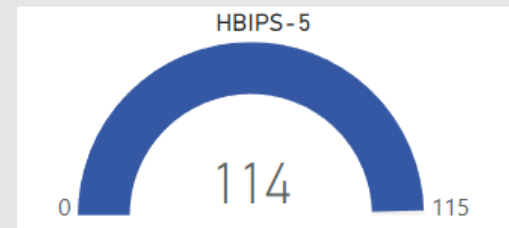
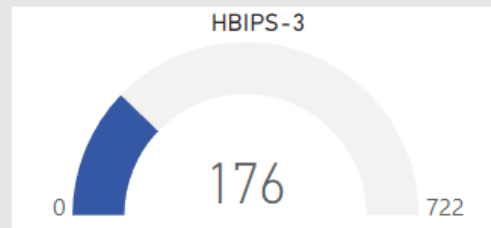
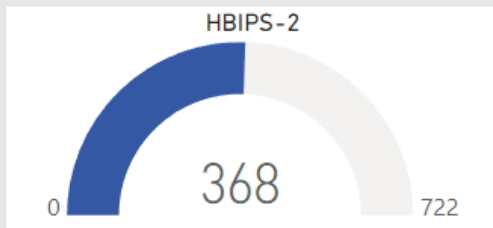
Select a month

- 2020
 - January
 - February
 - March

Inpatient Psychiatric Facility - Quality Reporting

Measure info

Measure	Measure_Description	Numerator	Denominator
HBIPS-2	Hours of Physical Restraint Use	368	722
HBIPS-3	Hours of Seclusion Use	176	722
HBIPS-5	Patients Discharged on Multiple Antipsychotic Medications	114	115



Numerator:

Hours psychiatric inpatients in restraints

Denominator:

Psychiatric inpatient days

Numerator:

Hours psychiatric inpatients in seclusion

Denominator:

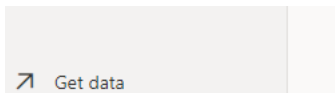
Psychiatric inpatient days

Numerator:

Psychiatric inpatients discharged on ≥ 2 antipsychotic medications with justification

Denominator:

Psychiatric inpatients discharged on ≥ 2 antipsychotic medications



Power BI Demo Reports



App

34 minutes ago

Apps



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, Publish, 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 ((Date Range))" displays "Overall Cases: [Overall_Covid19CaseCnt]" and "Outcomes" (Recovered, Exp). Below this is a "Current Patient Census" table with columns for "Pts", "Beds", "Occ Rate", "Has COVID-19", and "Has COVID Indica".

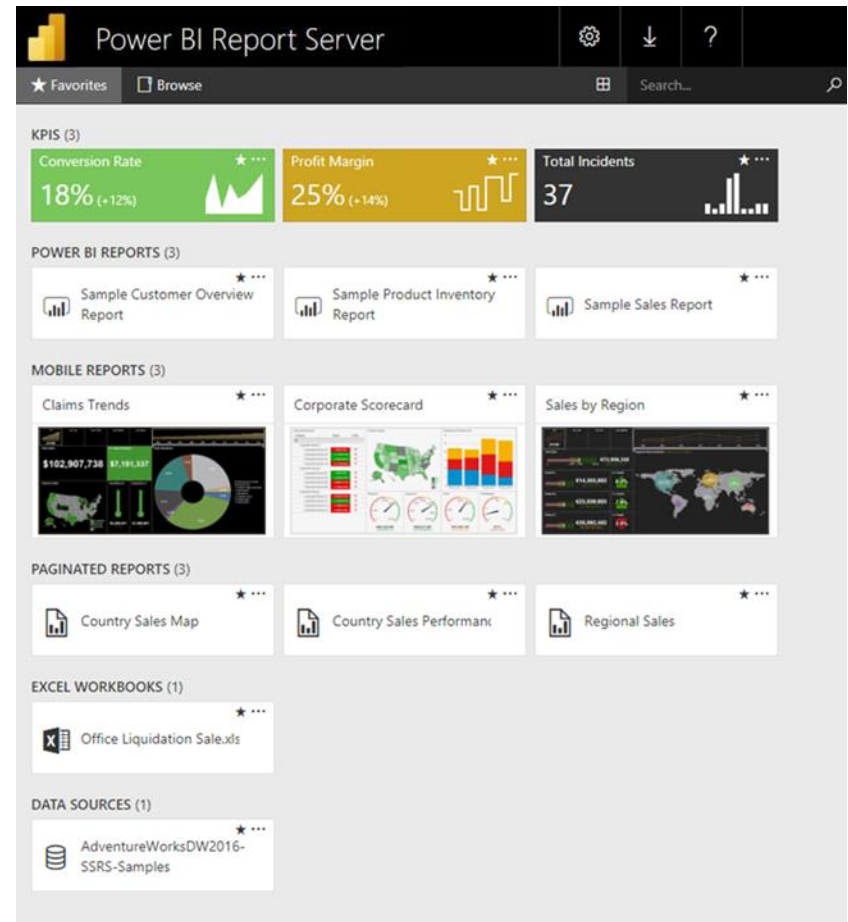
Facility COVID-19 Patient Data ((Date Range))		
Overall Cases: [Overall_Covid19CaseCnt]		
Outcomes	Recovered	Exp
[Overall_Covid19Outcomes]	[Overall_Covid19Recovered]	[Overall_Covid19Exp]
Lab Tests Performed	Negative	Pos
[CovidLabTestPerformed]	[CovidLabTestNegative]	[CovidLabTestPositive]

Current Patient Census					
	Pts	Beds	Occ Rate	Has COVID-19	Has COVID Indica
Total	[Overall_Covid19Pts]	[Overall_Covid19Beds]	[Overall_Covid19OccRate]	[Overall_Covid19HasCovid19]	[Overall_Covid19HasCovidIndica]
Location	ionTvn	BedCnt	OccRate	Tvno	Cens
[LocationName]	[LocationTvn]	[BedCnt]	[OccRate]	[Cens]	[Cens]



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.



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 chart is also present, showing a yellow bar representing the average census. The Solution Explorer on the right lists the report and other resources in the "WebReportLibrary" project. The Properties window at the bottom right shows the properties for the "chart1" chart, including its name and location.

WebReportLibrary - Microsoft Visual Studio

File Edit View Project Build Debug Team Format Report Tools Test Analyze Window Help

Debug Default Start 100%

Average Census by...of Day.rdl [Design]

Design Preview

StartDate EndDate

AcmeWare

[&ReportName]

[@StartDate] [@EndDate]

Hour of Day	Census
<Expr>	[Avq(Censi

100

Row Groups

Column Groups

[(table1_CensusDateHour)

Solution Explorer

WebReportLibrary

- Shared Data Sources
- WebReports.rds
- Shared Datasets
- Reports
 - Average Census by Hour of Day.rdl
 - Average Census by Hour of Day_61.rdl
 - Bad Debt Accounts By Date.rdl
 - Bad Debt Accounts By Date_61.rdl
 - Census by Attending Provider.rdl
 - z_Current Inpatients with Average A1c Result.rdl
 - z_Current Inpatients with Average A1c Result_61.rdl
 - zAllergies by Patient_61.rdl

Properties

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.

Output Error List

Ready

Add to Source Control

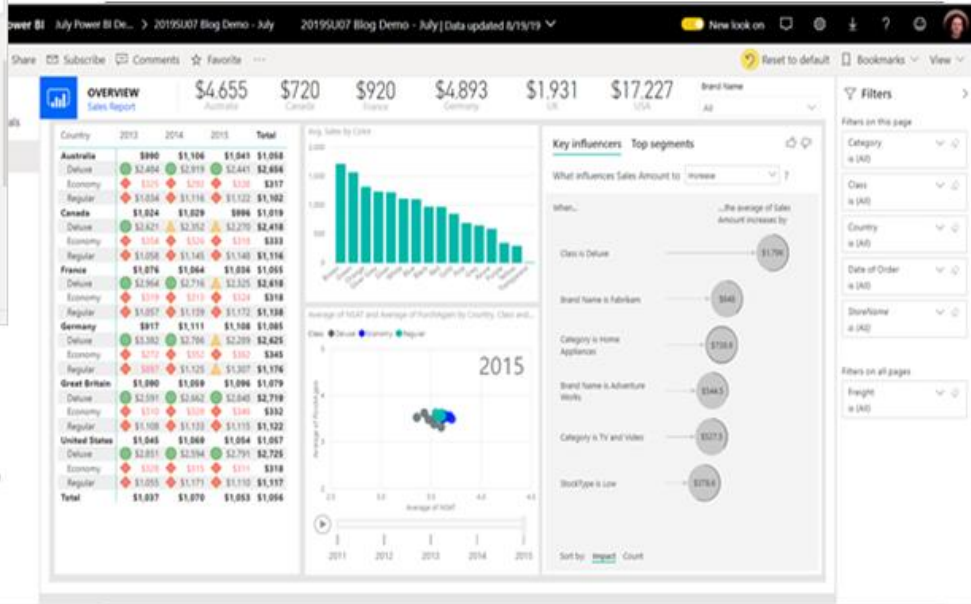


Working with Power BI

Power BI Desktop



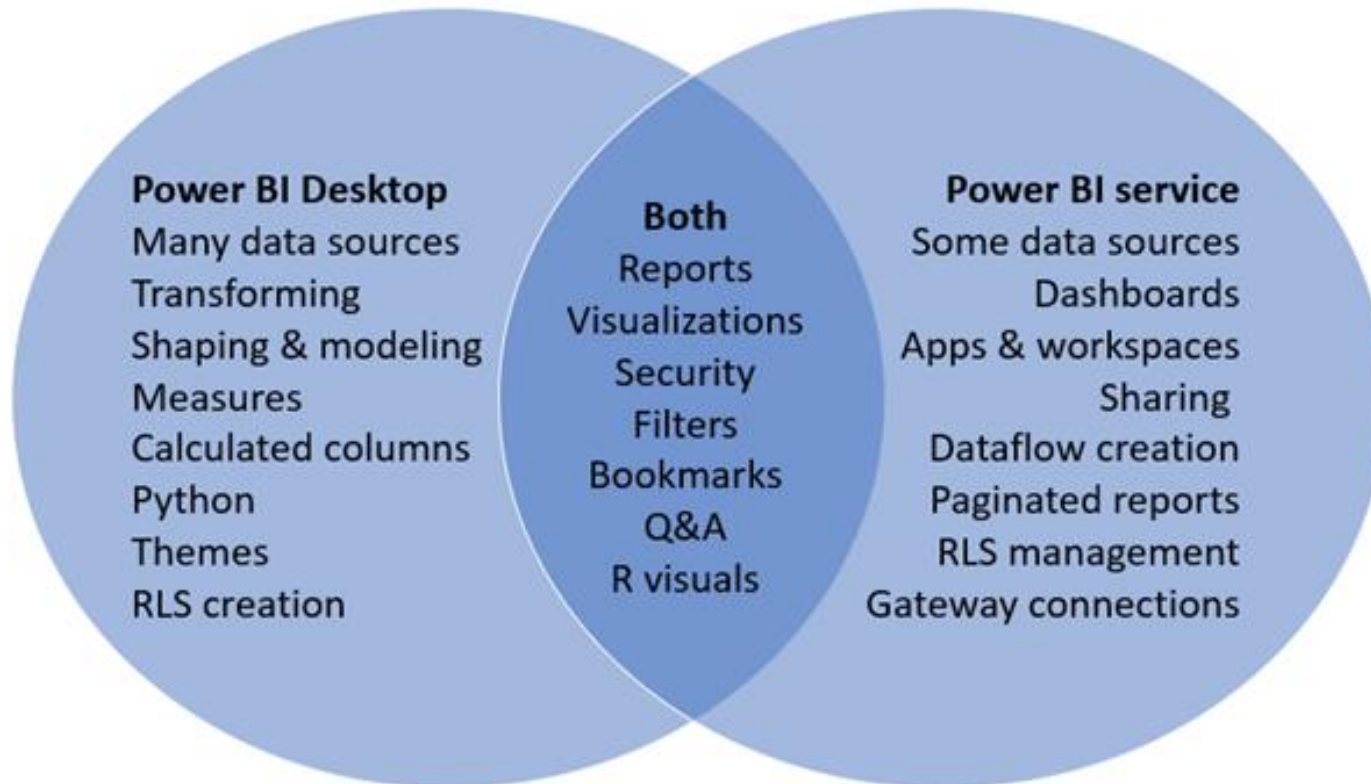
Power BI service



Power BI Mobile



Differences between Desktop and service



Questions and discussion



- > About the Power BI applications and services

Walk through: Power BI Desktop

- > Report design in detail



Shall we take a brief break?



Power BI Desktop terminology

- > Visualizations (or visuals)
- > Fields
- > Filters
- > Reports
- > Dashboards



Let's build a report

- > Hands-on with Power BI Desktop



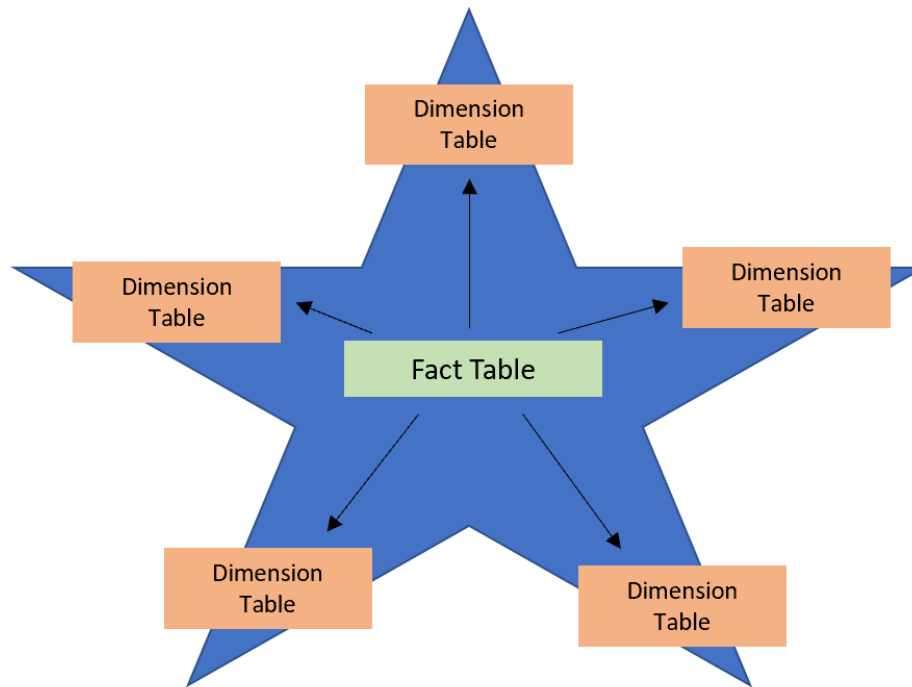
Sharing reports

- > Reports are published from PBI Desktop to **workspaces** in the PBI service:
 - > My workspace
 - > Teams/M365 group workspaces
- > Reports (and dashboards) can also be grouped into **Apps**, which lets you focus your users



The data model

- > Do I need a star-schema to use Power BI?



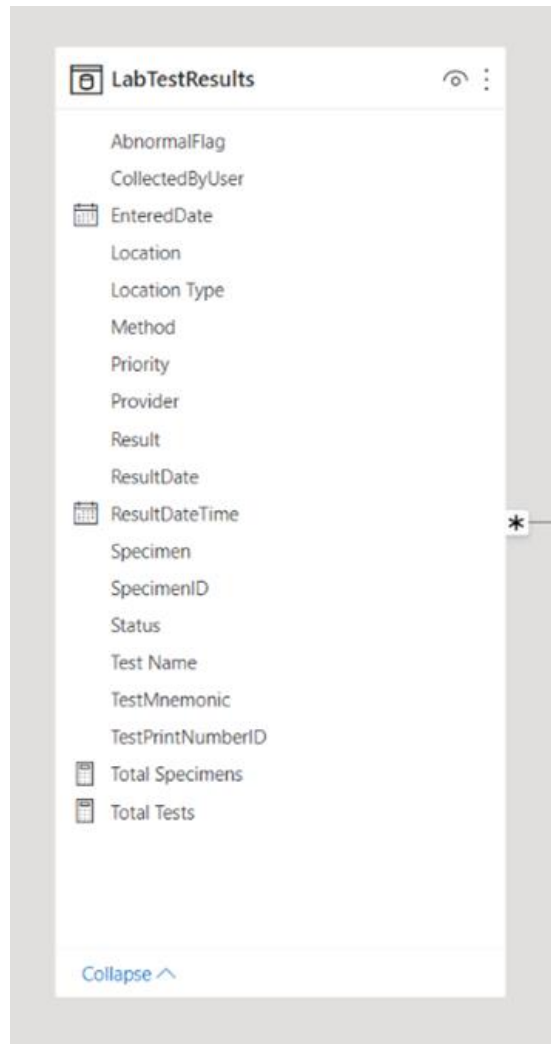
Why not “flatten” the model with TSQL?

```
SELECT
    LS.SpecimenID,
    LST.TestPrintNumberID,
    LS.SpecimenNumber
    ,DLT.Name AS TestName
    ,DLT.Mnemonic AS TestMnemonic
    ,LS.CollectedByUserID AS CollectedByUser
    ,LS.EnteredDateTime AS EnteredDate
    ,LST.ResultDateTime
    ,CAST(LST.ResultDateTime AS date) AS ResultDate
    ,LS.Priority
    ,LS.Status
    ,DMP.Name AS OrderingProvider
    ,DML.Name AS OrderLocation
    , CASE WHEN DML.Type = 'I' THEN 'Inpatient' WHEN DML.Type = 'O' THEN 'Outpatient' ELSE 'Other' END AS LocationType
    ,LST.MethodRW
    ,LST.ResultRW
    ,LST.AbnormalFlag
FROM
    livendb.dbo.LabSpecimens LS
INNER JOIN livendb.dbo.LabSpecimenTests LST
    ON LS.SourceID = LST.SourceID
    AND LS.SpecimenID = LST.SpecimenID
INNER JOIN livendb.dbo.DLabTest DLT
    ON LST.SourceID = DLT.SourceID
    AND LST.TestPrintNumberID = DLT.PrintNumberID
INNER JOIN livendb.dbo.DMisLocation DML
    ON LS.SourceID = DML.SourceID
    AND LS.OrderLocationID = DML.LocationID
INNER JOIN livendb.dbo.DMisProvider DMP
    ON LS.SourceID = DMP.SourceID
    AND LS.SubmProviderID = DMP.ProviderID
WHERE
    LS.Status = 'COMP'
```

This stored procedure...

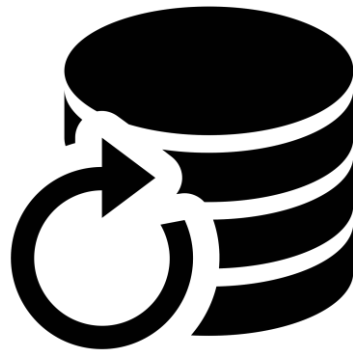


How it presents to Power BI Desktop



For our afternoon session...

Right back in this room, from 1:00 – 3:30



- > Power BI considerations for Data Repository
- > Data model concepts and options
- > Using SQL Server data sources

Open discussion

- > What questions do you have?
- > Do you have any real world DR problems I can help solve?



Microsoft Power BI



Keep in touch!

Me: iproffer@acmeware.com

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