Decentralizing Data Analysis Through Data Modeling

Tech Forward | September 23, 2019

FAMILY HEALTH INITIATIVES

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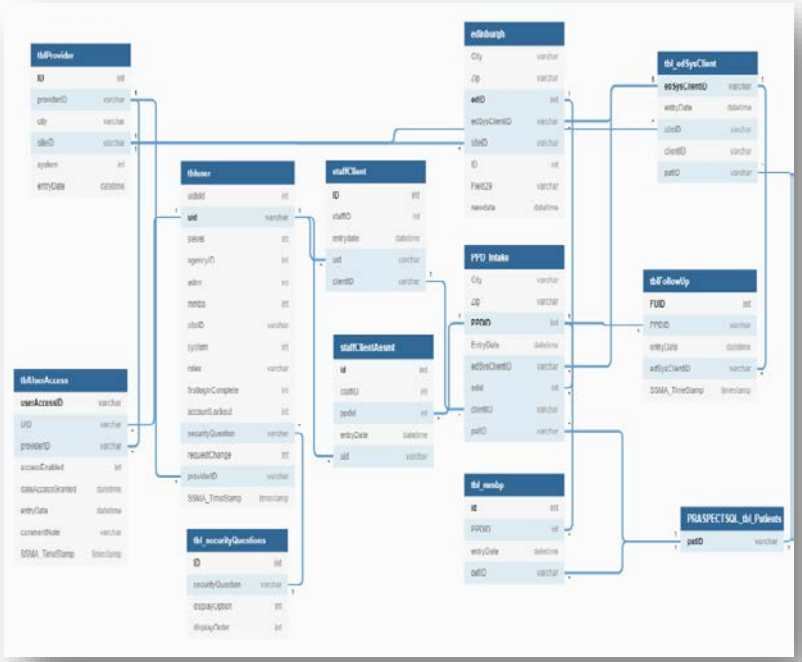
Pronouns: she/her/hers

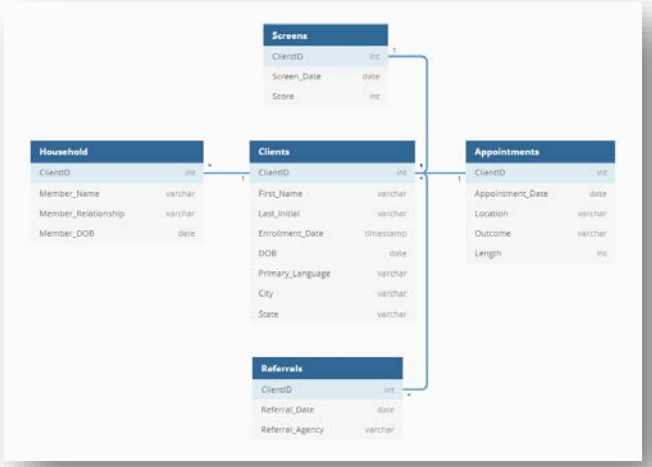
Decentralizing Data Analysis Through Data Modeling

Objective

To strip complexity from traditional data sources by building simplified data models that are comprehensible to a wider audience.

FAMILY HEALTH INITIATIVES

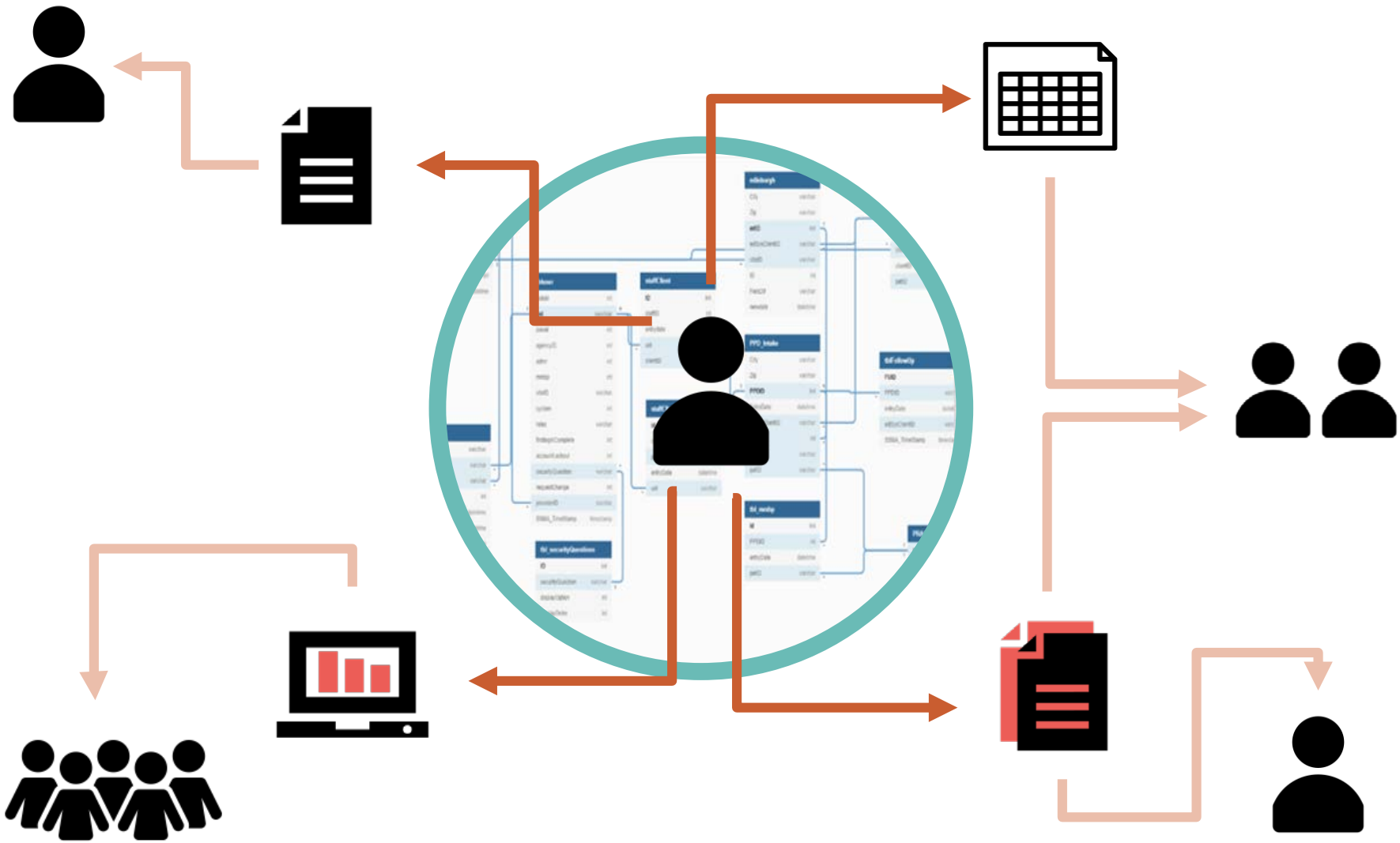




OR

County	ProgramEnrollmentDate	Year	Month	YearQtr	NFP/HF/PAT	InsuranceStatus	MCO
Passaic	Tuesday, January 8, 2019	2019	Jan	1819-Qtr3	HWHF	Commercial	None
Passaic	Tuesday, January 8, 2019	2019	Jan	1819-Qtr3	HWHF	Uninsured/Self-Pay	None
Hudson	Wednesday, February 27, 2019	2019	Feb	1819-Qtr3	HWHF	Uninsured/Self-Pay	None
Passaic	Tuesday, January 8, 2019	2019	Jan	1819-Qtr3	HWHF	Uninsured/Self-Pay	None
Passaic	Monday, January 14, 2019	2019	Jan	1819-Qtr3	HWHF	Medicaid PE	Horizon NJ Health
Passaic	Monday, February 4, 2019	2019	Feb	1819-Qtr3	HWHF	Uninsured/Self-Pay	None
Passaic	Thursday, January 24, 2019	2019	Jan	1819-Qtr3	HWHF	Medicaid MC	AmeriGroup
Bergen	Friday, February 1, 2019	2019	Feb	1819-Qtr3	HWHF	Medicaid PE	Horizon NJ Health
Hudson	Monday, January 14, 2019	2019	Jan	1819-Qtr3	HWHF	Medicaid MC	UnitedHealthcare Community
Hudson	Thursday, February 14, 2019	2019	Feb	1819-Qtr3	HWHF	Medicaid MC	Horizon NJ Health
Hudson	Tuesday, January 8, 2019	2019	Jan	1819-Qtr3	HWHF	Uninsured/Self-Pay	None
Passaic	Thursday, January 17, 2019	2019	Jan	1819-Qtr3	HWHF	Uninsured/Self-Pay	None
Passaic	Tuesday, January 8, 2019	2019	Jan	1819-Qtr3	HWHF	Uninsured/Self-Pay	None
Passaic	Tuesday, January 8, 2019	2019	Jan	1819-Qtr3	HWHF	Uninsured/Self-Pay	None
Passaic	Monday, January 14, 2019	2019	Jan	1819-Qtr3	HWHF	Uninsured/Self-Pay	None
Passaic	Thursday, January 17, 2019	2019	Jan	1819-Qtr3	HWHF	Medicaid PE	Horizon NJ Health
Hudson	Wednesday, January 23, 2019	2019	Jan	1819-Qtr3	HWHF	Uninsured/Self-Pay	None
Passaic	Thursday, January 24, 2019	2019	Jan	1819-Qtr3	HWHF	Medicaid MC	Horizon NJ Health
Passaic	Monday, February 4, 2019	2019	Feb	1819-Qtr3	HWHF	Uninsured/Self-Pay	None
Bergen	Tuesday, April 2, 2019	2019	Apr	1819-Qtr4	HWHF	Medicaid	Aetna Better Health
Passaic	Monday, February 4, 2019	2019	Feb	1819-Qtr3	HWHF	Uninsured/Self-Pay	None
Passaic	Monday, February 4, 2019	2019	Feb	1819-Qtr3	HWHF	Medicaid MC	Horizon NJ Health
Passaic	Friday, February 15, 2019	2019	Feb	1819-Qtr3	HWHF	Medicaid MC	Horizon NJ Health
Passaic	Thursday, February 28, 2019	2019	Feb	1819-Qtr3	HWHF	Medicaid PE	Horizon NJ Health
Passaic	Thursday, February 28, 2019	2019	Feb	1819-Qtr3	HWHF	Uninsured/Self-Pay	None
Morris	Thursday, February 14, 2019	2019	Feb	1819-Qtr3	HWHF	NJ Family Care	UnitedHealthcare Community
Hudson	Wednesday, March 20, 2019	2019	Mar	1819-Qtr3	HWHF	Uninsured/Self-Pay	None

FAMILY HEALTH INITIATIVES



FAMILY HEALTH INITIATIVES

DATA EXPERT(S)

CONTENT EXPERTS

DATA CONSUMERS

FAMILY HEALTH INITIATIVES

Content Experts

Program Leadership

Epidemiologists

Social Workers

Nurses

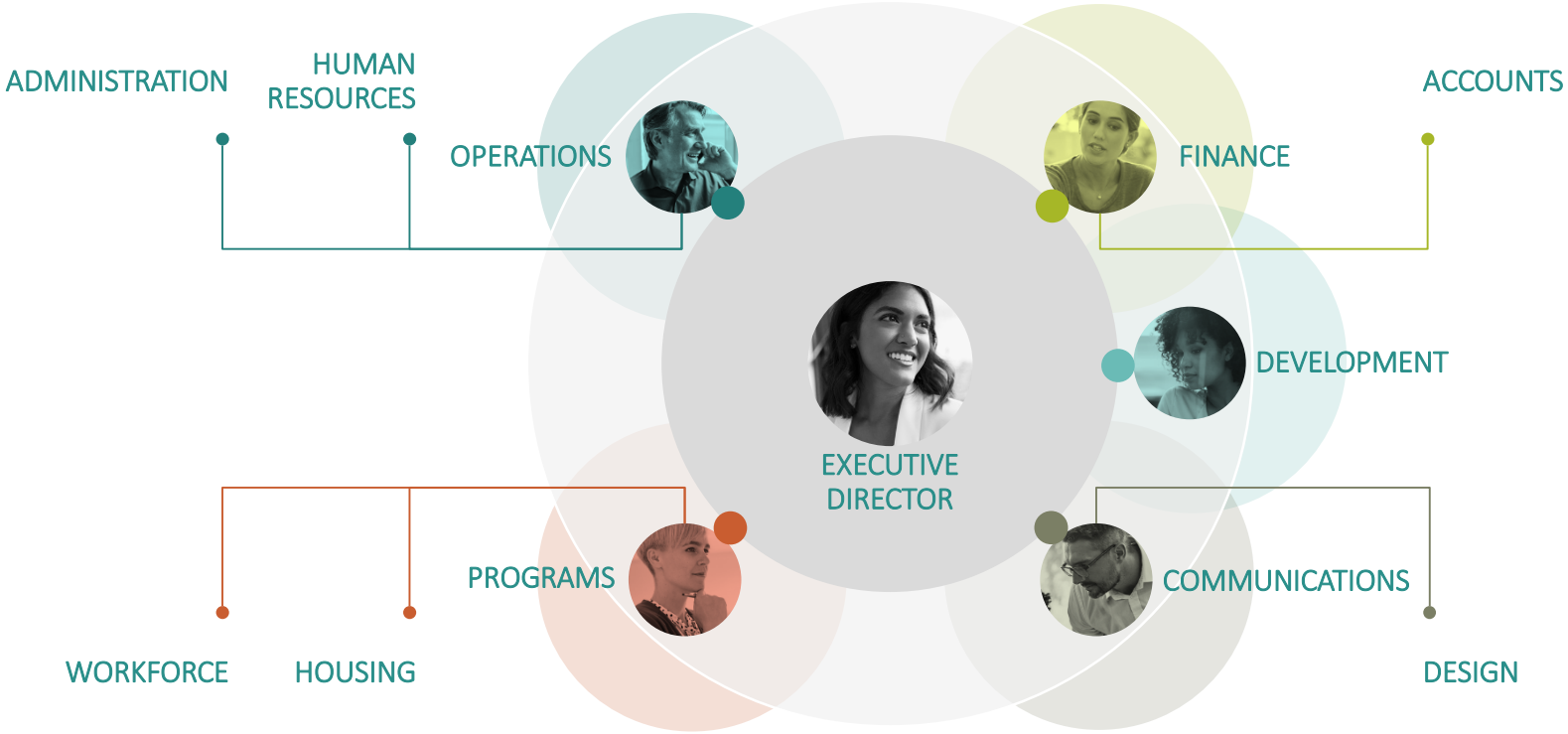
Evaluators

Educators

Data Analysts

FAMILY HEALTH INITIATIVES

Where are they?



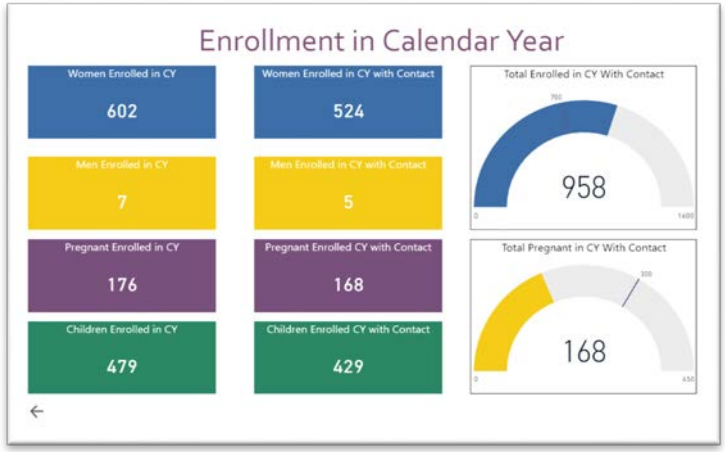
FAMILY HEALTH INITIATIVES

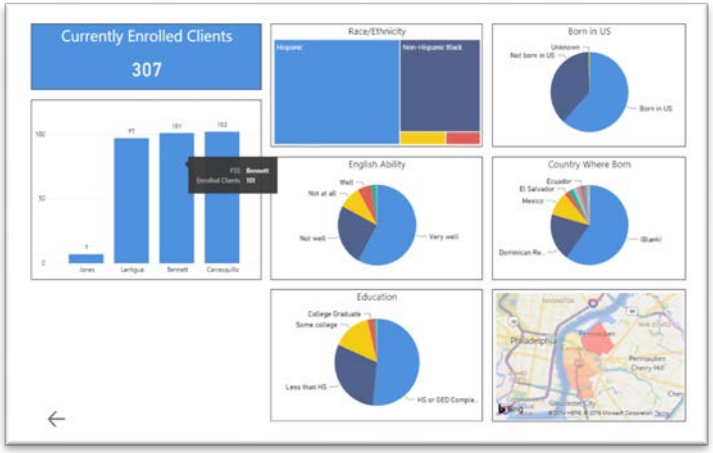
Why Decentralize?

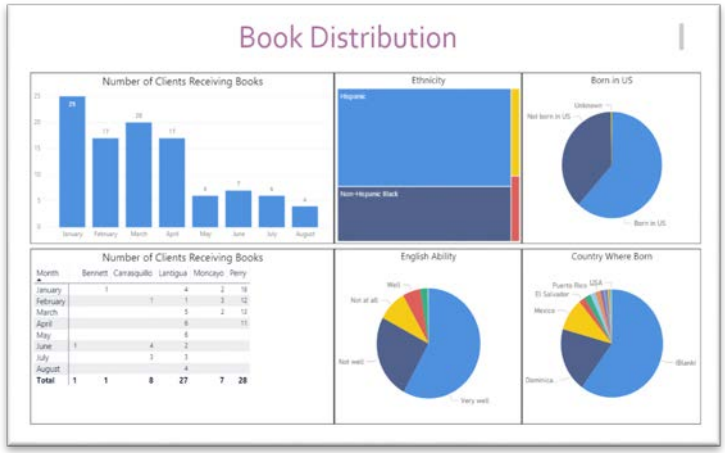
- Alleviate data bottlenecks
- Give content experts more access to (their!) data
- Standardize reporting measures and definitions
- Bring more people and perspectives into the conversation
- Ask better questions

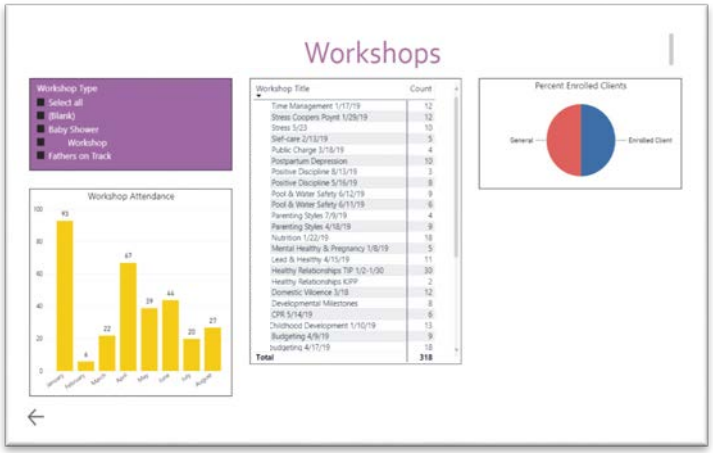
- Because you can: data modeling and visualization tools are increasingly accessible and affordable

FAMILY HEALTH INITIATIVES









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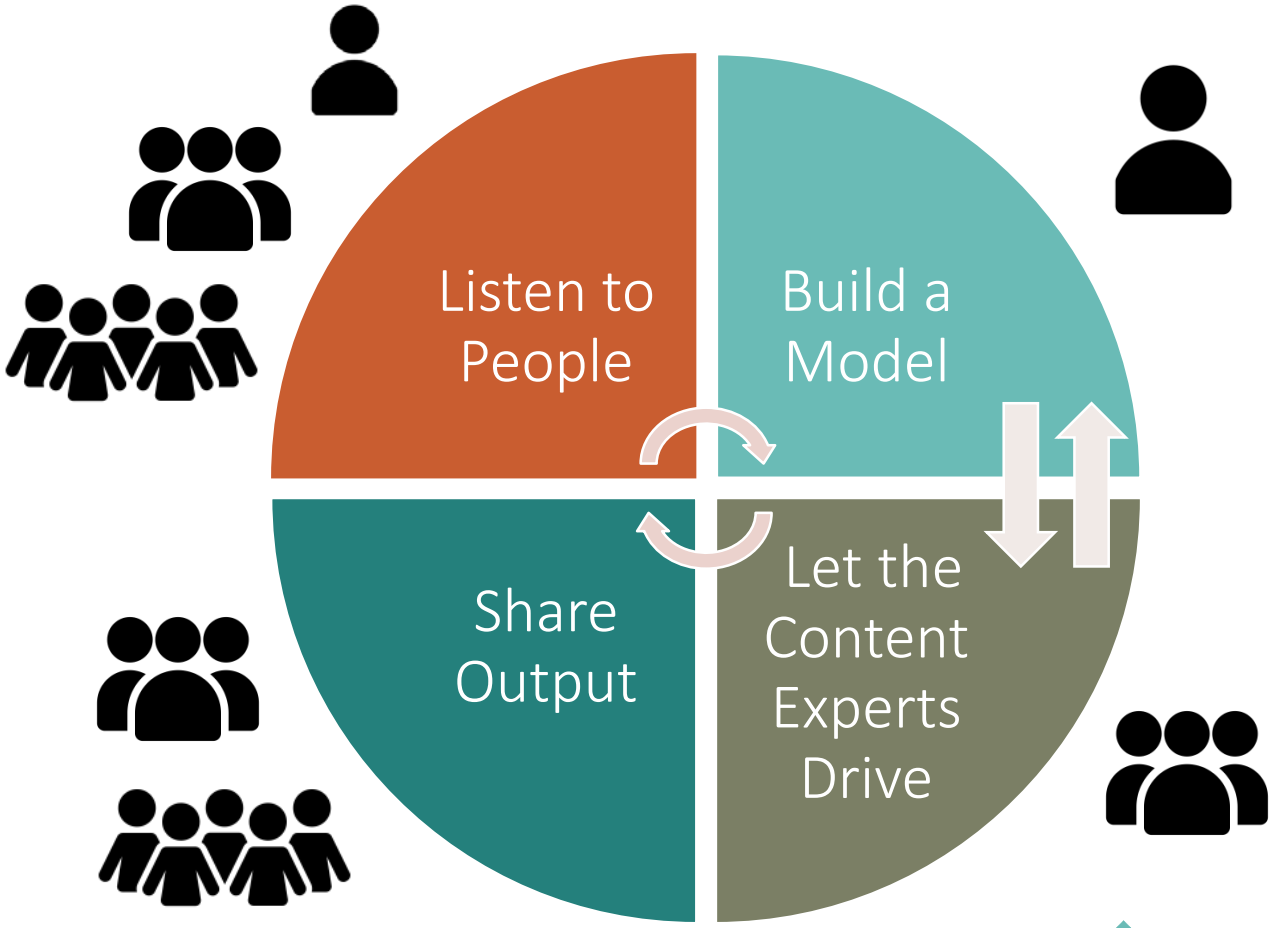
Putting It Into Practice



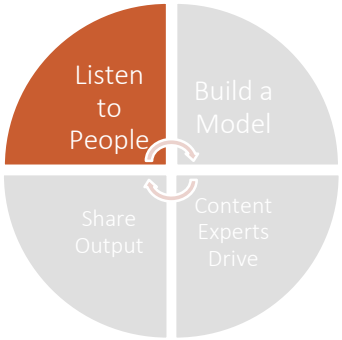
FAMILY HEALTH INITIATIVES

~~Discovery~~

~~Talk to Users~~

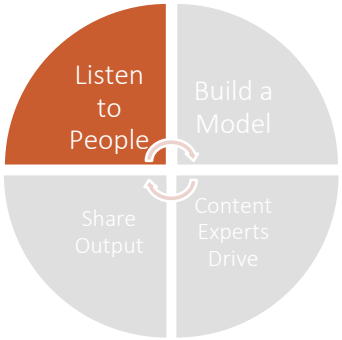
~~Talk to People~~

Listen to People



FAMILY HEALTH INITIATIVES

Listen to People



- Connect with data consumers at all levels and of all kinds
- Go to them
- “What would success look like?”
- Anecdotes are full of clues
- Shadowing
- Traditional discovery

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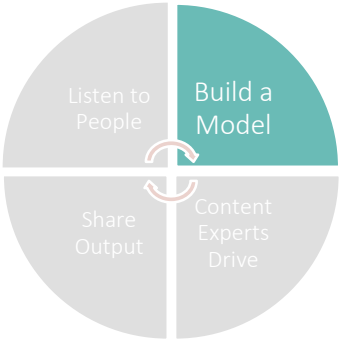
Build A Model



Cherry-pick Data Elements

Filter Rows

Use Intermediate/ Summary Queries

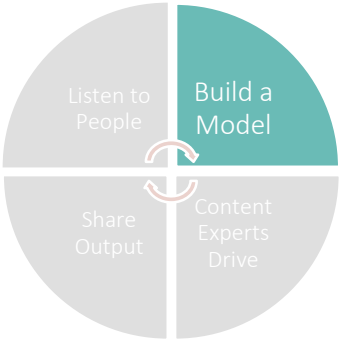
Create Columns

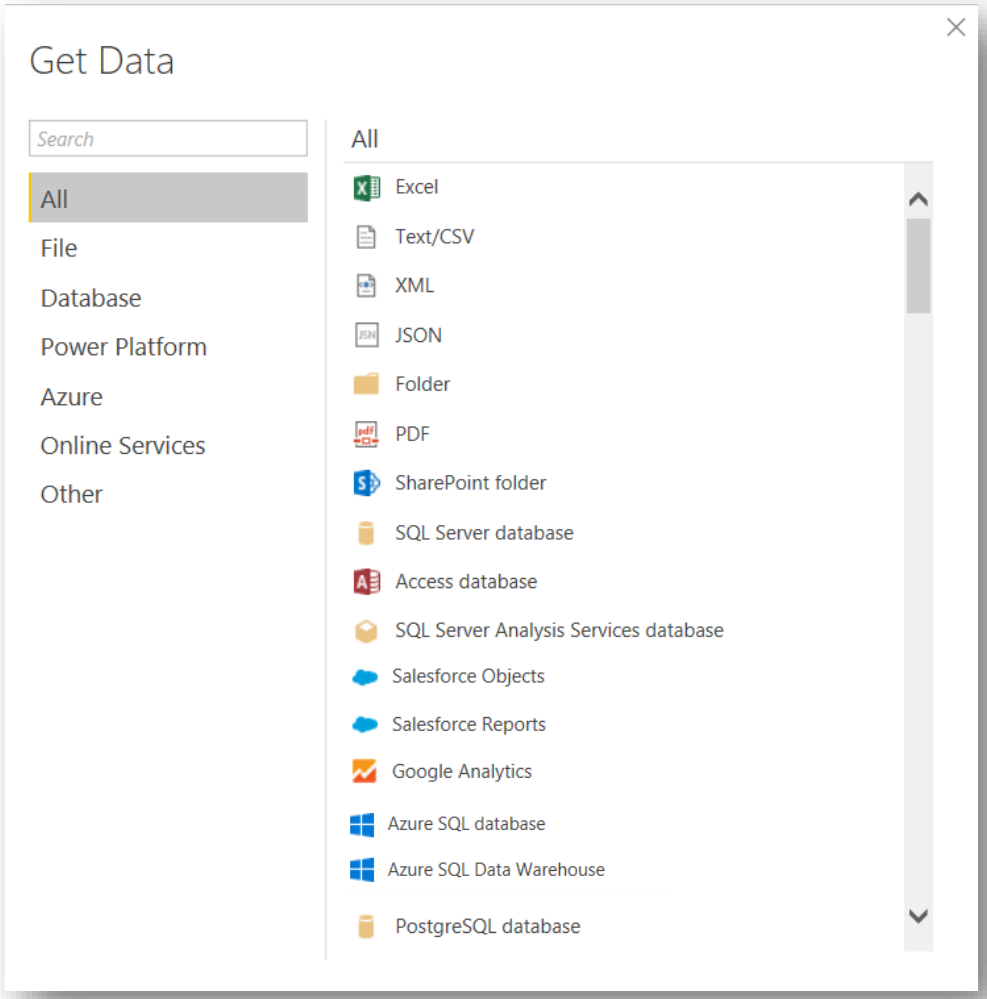
Add a Semantic Layer

Transform Data

Validate

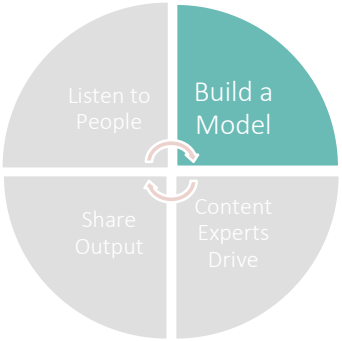
FAMILY HEALTH INITIATIVES





FAMILY HEALTH INITIATIVES

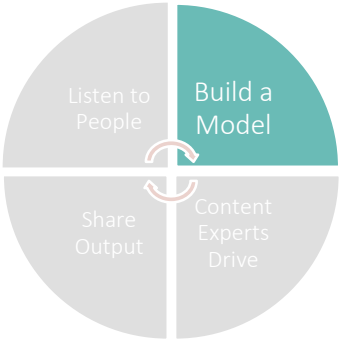
Choose Data



Cherry-pick Data Elements	Narrow	Hide *almost* everything	SELECT FROM
Filter Rows	Broad	Filter conservatively	WHERE

FAMILY HEALTH INITIATIVES

Transform Data



Transform Data

- Change data types
- Replace values
- Address null values and errors
- Format text fields
- Format date and time fields
- Extract data

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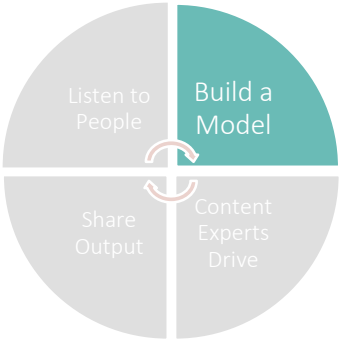
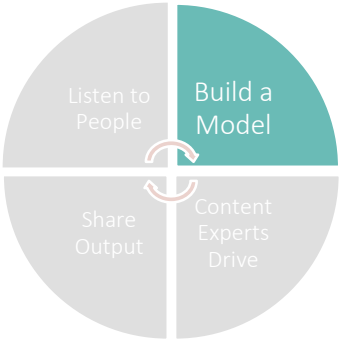
Expand Upon Existing Data



Use Intermediate/Summary Queries	Create Columns
Aggregation	Calculated fields
Merge tables	Merged columns
Consider Hiding	Custom formulas

FAMILY HEALTH INITIATIVES

Make it Readable



Add a Semantic Layer

Translate metadata to English*

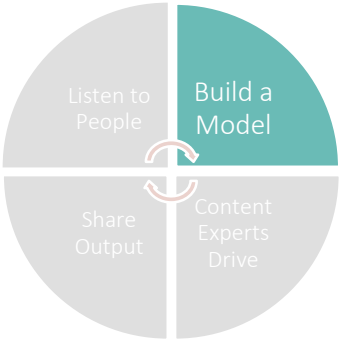
Table/Object Names

Field/Column Names

FAMILY HEALTH INITIATIVES

APPLIED STEPS

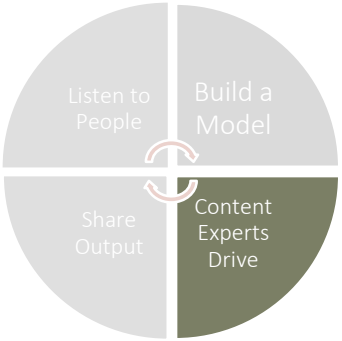
- Source
- Navigation
- Sorted Rows
- Filtered Rows
- Changed Type
- Replaced Value
- Replaced Value1
- Replaced Value2
- Replaced Value3
- Changed Type1
- Removed Columns
- Renamed Columns
- Inserted Merged Column
- Inserted Merged Column1
- Merged Queries
- Expanded RegionSum
- Renamed Columns1
- Merged Queries1
- Expanded CountySum
- Added Custom
- Renamed Columns2
- Changed Type2
- Reordered Columns




```
let
    Source = Sql.Database("172.24.16.85", "praSpectSQL"),
    dbo_z_PBI_4Ps = Source{[Schema="dbo",Item="z_PBI_4Ps"]}[Data],
    #"Sorted Rows" = Table.Sort(dbo_z_PBI_4Ps,{{"Provider Code", Order.Ascending}}),
    #"Filtered Rows" = Table.SelectRows(#"Sorted Rows", each [County] <> null and [County] <> ""),
    #"Changed Type" = Table.TransformColumnTypes(#"Filtered Rows",{{"Quarter", type text}}),
    #"Replaced Value" = Table.ReplaceValue(#"Changed Type","1","Q1",Replacer.ReplaceText,{"Quarter"}),
    #"Replaced Value1" = Table.ReplaceValue(#"Replaced Value","2","Q2",Replacer.ReplaceText,{"Quarter"}),
    #"Replaced Value2" = Table.ReplaceValue(#"Replaced Value1","3","Q3",Replacer.ReplaceText,{"Quarter"}),
    #"Replaced Value3" = Table.ReplaceValue(#"Replaced Value2","4","Q4",Replacer.ReplaceText,{"Quarter"}),
    #"Changed Type1" = Table.TransformColumnTypes(#"Replaced Value3",{{"Completed Screens", Int64.Type}, {"4Ps",
    #"Removed Columns" = Table.RemoveColumns(#"Changed Type1",{"Header", "BR3", "BR4", "BR5", "BR6"}),
    #"Renamed Columns" = Table.RenameColumns(#"Removed Columns",{{"ctLanguage_Total", "Language - Total"}, {"Engl
    #"Inserted Merged Column" = Table.AddColumn(#"Renamed Columns", "RYQ", each Text.Combine({[Region], [FYear],
    #"Inserted Merged Column1" = Table.AddColumn(#"Inserted Merged Column", "CYQ", each Text.Combine({[County], [
    #"Merged Queries" = Table.NestedJoin(#"Inserted Merged Column1",{"RYQ"},RegionSum,{"RYQ"},"RegionSum",JoinKin
    #"Expanded RegionSum" = Table.ExpandTableColumn(#"Merged Queries", "RegionSum", {"REGION - Total Screens"}, {
    #"Renamed Columns1" = Table.RenameColumns(#"Expanded RegionSum",{{"RegionSum.REGION - Total Screens", "REGION
    #"Merged Queries1" = Table.NestedJoin(#"Renamed Columns1",{"CYQ"},CountySum,{"CYQ"},"CountySum",JoinKind.Left
    #"Expanded CountySum" = Table.ExpandTableColumn(#"Merged Queries1", "CountySum", {"COUNTY - Total Screens"},
    #"Added Custom" = Table.AddColumn(#"Expanded CountySum", "PROVIDER >>", each " "),
    #"Renamed Columns2" = Table.RenameColumns(#"Added Custom",{{"Parents", "Parents use a problem"}, {"Partner1",
    #"Changed Type2" = Table.TransformColumnTypes(#"Renamed Columns2",{{"AppropriateRefEdGiven_DV", Int64.Type},
    #"Reordered Columns" = Table.ReorderColumns(#"Changed Type2",{"County", "FYear", "Quarter", "Completed Screen
```

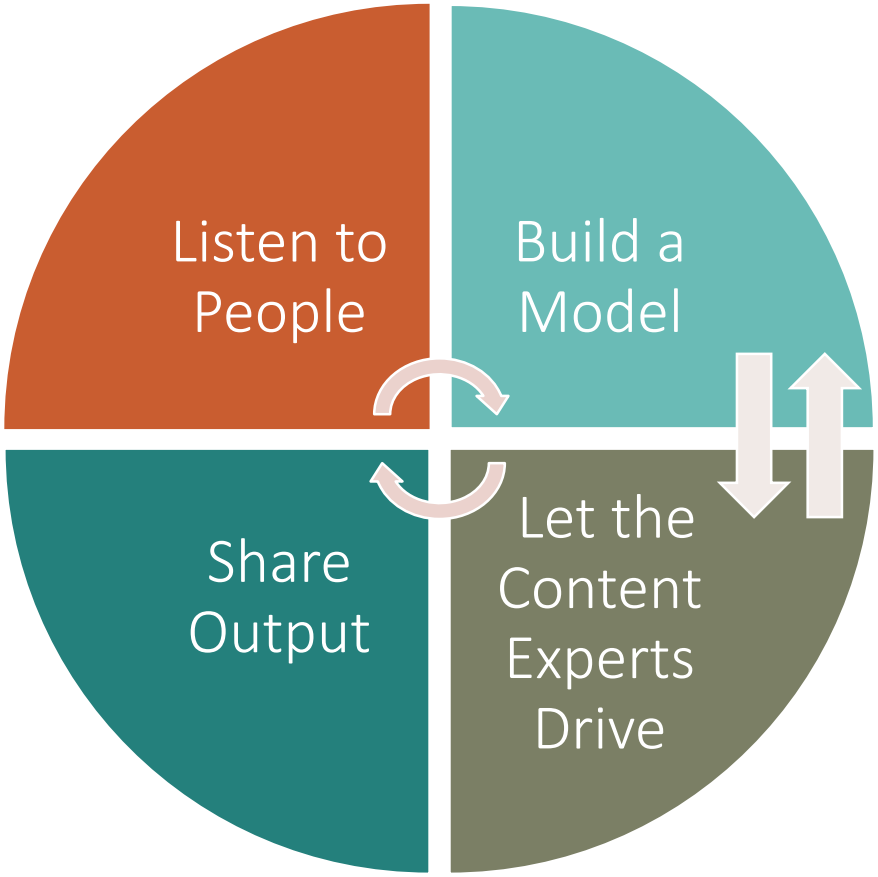
FAMILY HEALTH INITIATIVES

Let the Content Experts Drive



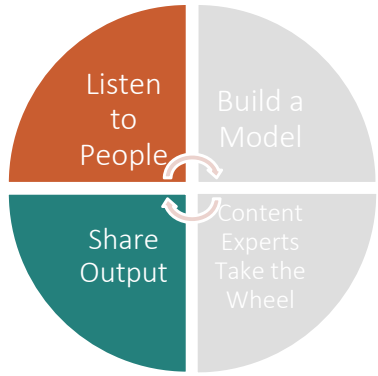
- Give them the data in a format/application they are familiar with
- Provide training
- Be prepared for lots of back and forth…or long periods of silence

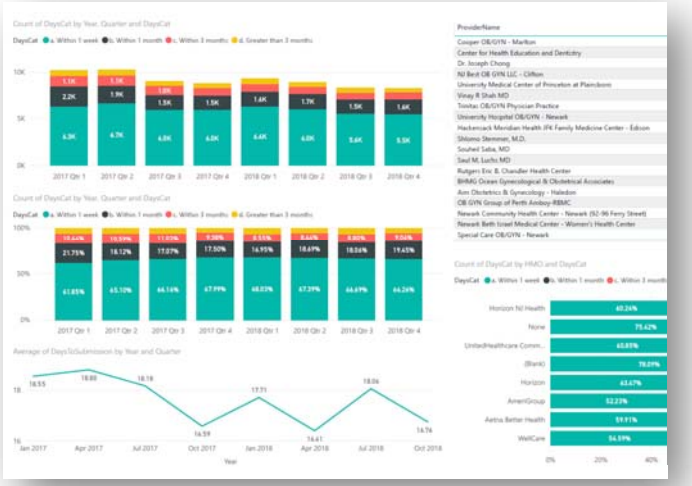
FAMILY HEALTH INITIATIVES

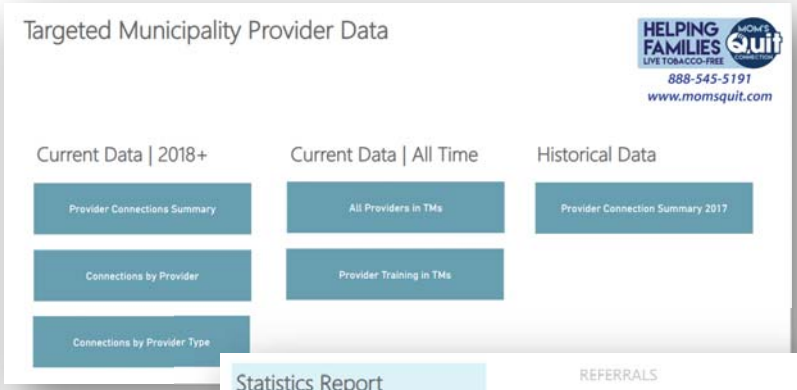


FAMILY HEALTH INITIATIVES

Share Output & Incorporate Feedback







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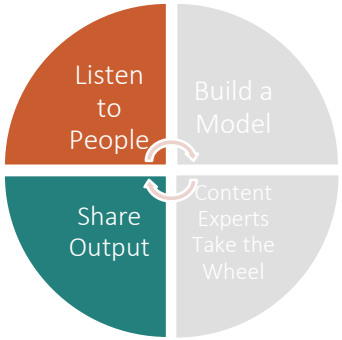
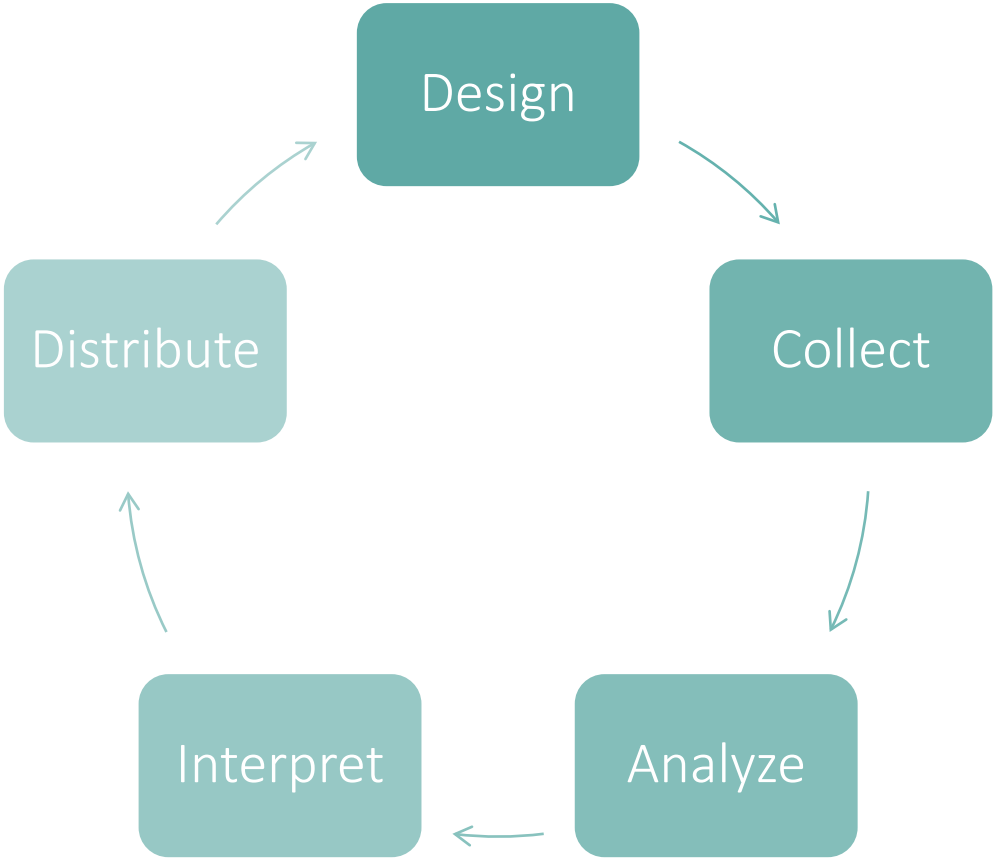
Share Output & Incorporate Feedback





FAMILY HEALTH INITIATIVES

Not everything that counts can be counted,
and not everything that can be counted counts.

Albert Einstein (maybe)

Some Considerations

POTENTIAL PITFALLS	GET AHEAD OF IT
Misinterpretation	• Modify your publication approval process
Changes to data inputs	• Schedule regular reviews of data and outputs
Privacy concerns	• Apply appropriate user-level permissions

FAMILY HEALTH INITIATIVES

Thank You!

Tracy Butler

Data Analyst and Reporting Manager

Patricia McGrane, Ph. D.

Quality Improvement Manager

Discussion

Resources

http://fhiworks.org/

https://powerbi.microsoft.com/en-us/desktop/

https://weallcount.com/

cgolightly@fhiworks.org

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