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Public Health

Connecticut's Lightweight and Affordable Electronic Case Reporting (eCR) Power BI Report

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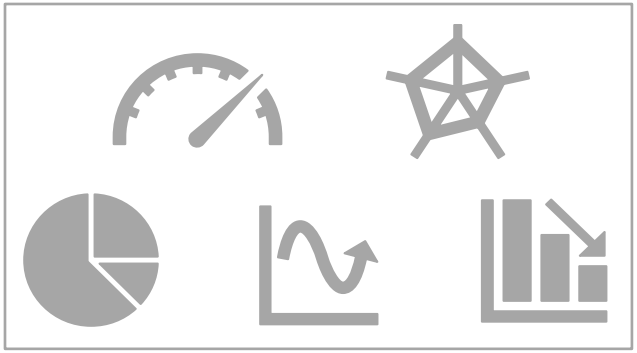
Background

Issues:

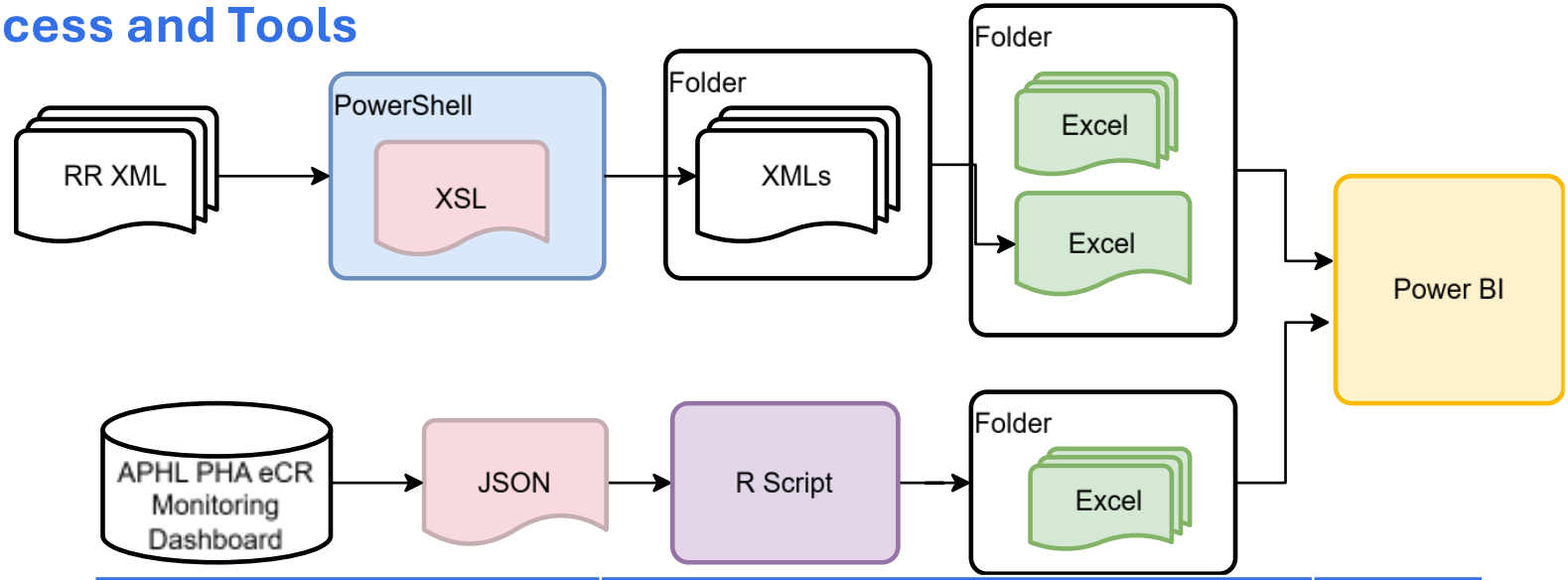
- No monitoring report for eCR volume/QA
- No way to validate that all eCRs were received
- Technical support not available for reporting infrastructure



We used common tools to:

- View of eCR volume/QA
- View the impact of RCKMS authoring
- Check eCRs reported by APHL matched received eCRs

Process and Tools



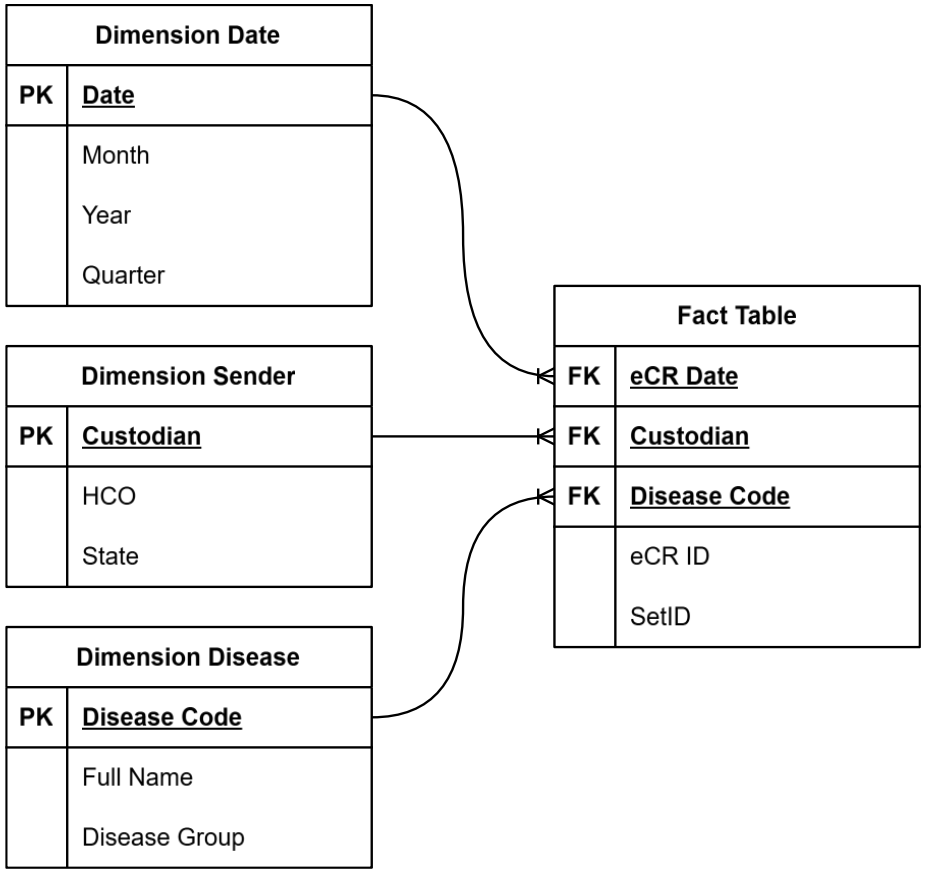
Tool	Use	Cost
Notepad++/ VS Code	XSL/JSON code development	Free
PowerShell	Looping through RRs	Free
Microsoft Excel/ Power Query	Combining/ transforming data	Depends
R	Transforming JSON and data aggregation	Free
Power BI Desktop	Visualization, Data Analysis, and Modeling	Free

Process and Tools: Data Modeling

Star Schema

- One-to-Many Relationships
- Fact Table- events, reportable conditions by document
- Dimension Table- descriptive information

Allows for complex analyses between different data sources



Process and Tools: RR Data

eCR ID	SetID	Version	Condition
123	5c	1	Condition-A
123	5c	1	Condition-B
234	4c	1	Condition-A

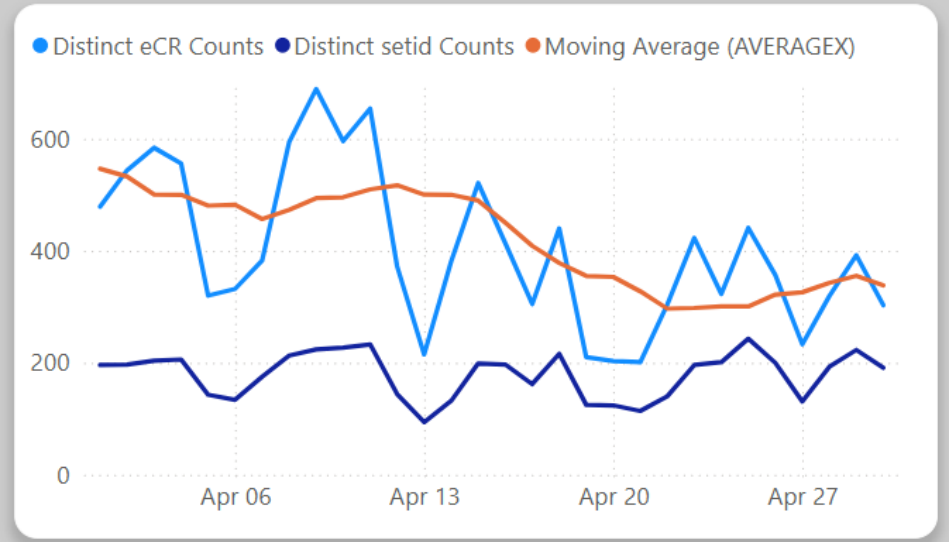
- Every reportable condition to CT equals one event
- Method essentially creates “Fact Table”
- Dimensions created from other information

Header	Data
eCR ID	1.2.840.114350.1.13.xxx.2.7.8.688883.xxxxxxxxxxxx
SetID	bbbbbbb-eeee-1111-9999-ddddddddd
Version	9
ECR Date	2/5/2025
Encounter Date	2/3/2025
Encounter Code	IMP
Initiation Code	
Provider Org Name	Provider Organization Name
Provider Org Street	123 SESAME ST
Provider Org City	NEW HAVEN
Provider Org State	CT
Provider Org Zip	06510
ECR Process Code	eICR processed
Determination Of Reportability	Reportable
Condition Code	840539006
Condition Text	Disease caused by severe acute respiratory syndrome coronavirus 2 (disorder)
RCKMS Rules Met	Detection of SARS-CoV-2 nucleic acid in a clinical or post-mortem specimen by any method_Hospitalized during encounter

Results – Overall Monitoring Report

- High level view of eCR metrics
- Good for leadership and CDC reporting
- Flexible: add in flags for emergent condition eCRs

Total eCRs	2024 eCRs Received for Mpox	2025 eCRs Received for Mpox
12,088	44	6
Total Unique Encounters	**2024 eCRs Received for Measles**	**2025 eCRs Received for Measles**
3,344	11	56

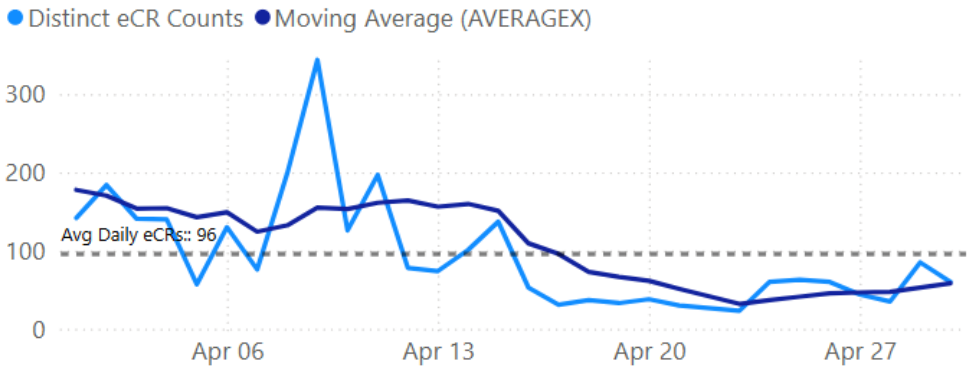


Data from 01Apr2025-30Apr2025

Results – Sender Monitoring

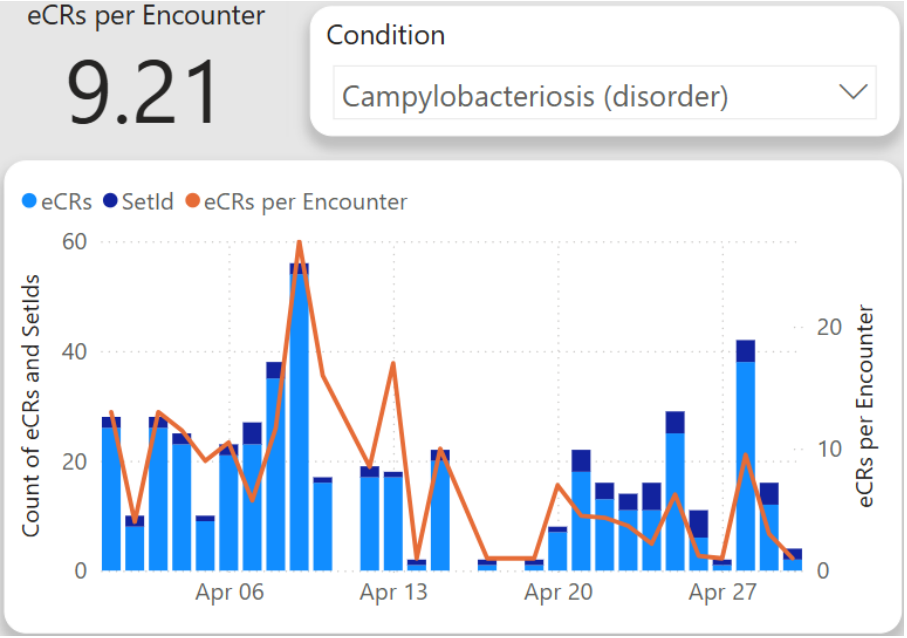
- Track the volume of eCRs by sender
- See trends with rolling averages
- Ability to add in encounter types or other variables

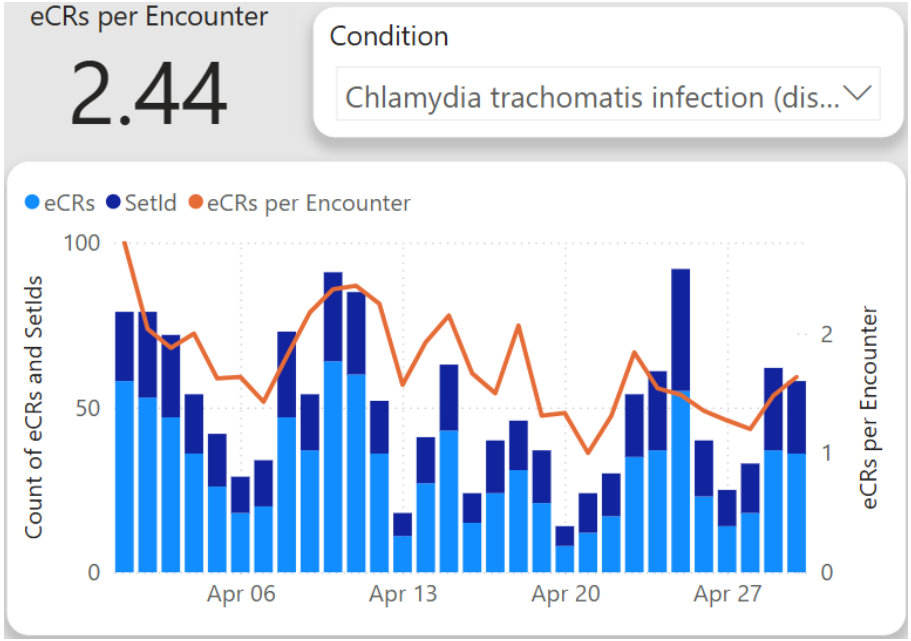
eCR Date		HCO-A	HCO-B	HCO-C	HCO-D	HCO-E
4/1/2025	37	142	1	17	1	15
4/2/2025	57	184		2	1	4
4/3/2025	71	141		8	1	11
4/4/2025	125	140		6		12
4/5/2025	29	57	1	18		4
4/6/2025	17	130		20		7
Total	**1,480**	**2,778**	**5**	**452**	**6**	**225**



Data from 01Apr2025-30Apr2025

Results – Analyze Volume of eCRs by Condition





- View volume differences between conditions or by sender (not shown)
- Anticipate processing needs
- Adjust business rules based on expected volume

Data from 01Apr2025-30Apr2025

Results – Check CT RCKMS Authoring Rules

Condition and RCKMS Rules Met	Unique Encounters
Babesiosis (disorder)	**88**
→ Babesiosis (as a diagnosis or active problem) [Timeboxed to 5 Days]_^	68
→ Babesiosis (as a diagnosis or active problem) [Timeboxed to 5 Days]_Detection of Babesia species antibody in a clinical specimen by any method_^	1
→ Detection of Babesia species antibody in a clinical specimen by any method_^	18
→ Detection of Babesia species nucleic acid in a clinical specimen by any method_^	1
→ Microscopic observation of intraerythrocytic Babesia organisms in a blood smear_^	1

- Check RCKMS authoring in production eCRs
- View impact of authoring changes
- Analyze patterns in rules being met and validate against eCRs

Data from 16Mar2025-30Apr2025

Results – Comparison to APHL PHA eCR Monitoring Dashboard*

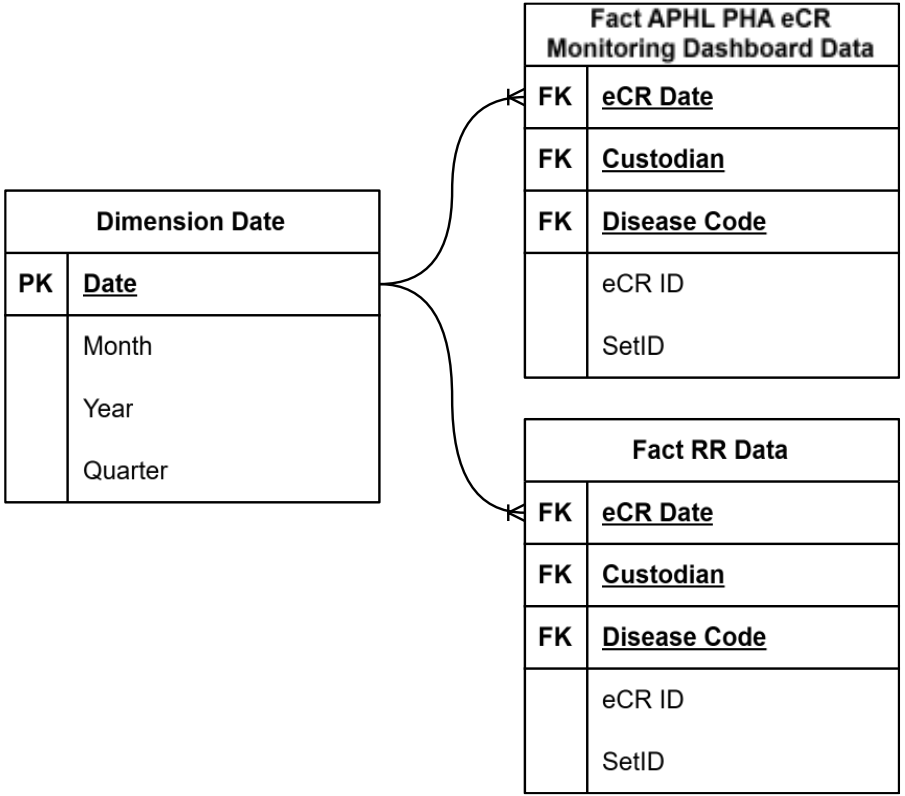
Compare eCRs in the APHL PHA eCR Monitoring Dashboard to eCRs received at DPH to check:

- DPH is receiving all eCRs we should
- The APHL PHA eCR Monitoring Dashboard has all the eCRs received by DPH

Comparison possible because of the:

- Relationships between the fact and dimension tables
- Analysis engine in Power BI

*DPH eCR Lead Approved for Validation

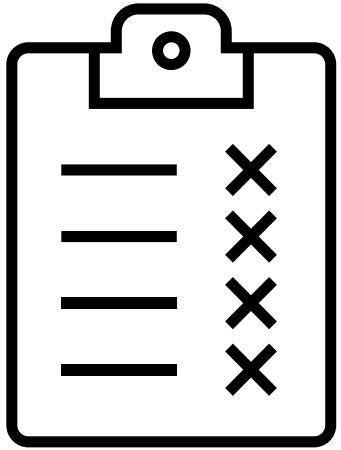


Pros

1. Free or nearly free
2. Lightweight
3. Able to easily remove old data
4. Low barrier to entry
5. Lots of great resources for learning

Cons

1. Not Automated (< 10 min/day)
2. Relies on Excel Files
3. Can be slow at times
4. Cannot share reports with others
5. Does not auto-refresh



Take Away

- Expensive technology may not be feasible or realistic for everyone

- Public health informatics professionals need:
    - To be discerning with available technology and needs
    - Use sustainable and standard techniques with good data hygiene

- Common tools can be used to build low-cost, lightweight monitoring tools, that can help us do our jobs more efficiently