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# Electronic Case Reporting Data Validation and Quality Assurance, Connecticut, 2023: Use of PowerShell, XSLT, and Power Query to Improve Efficiency and Timeliness

Mike Schneider, MPH
Suzanne Speers, MPH
Nancy L Barrett, MPH MS
Connecticut Department of Public Health
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# Disclosures

- No financial interests
- Not an expert
- Not better

# What's the problem?

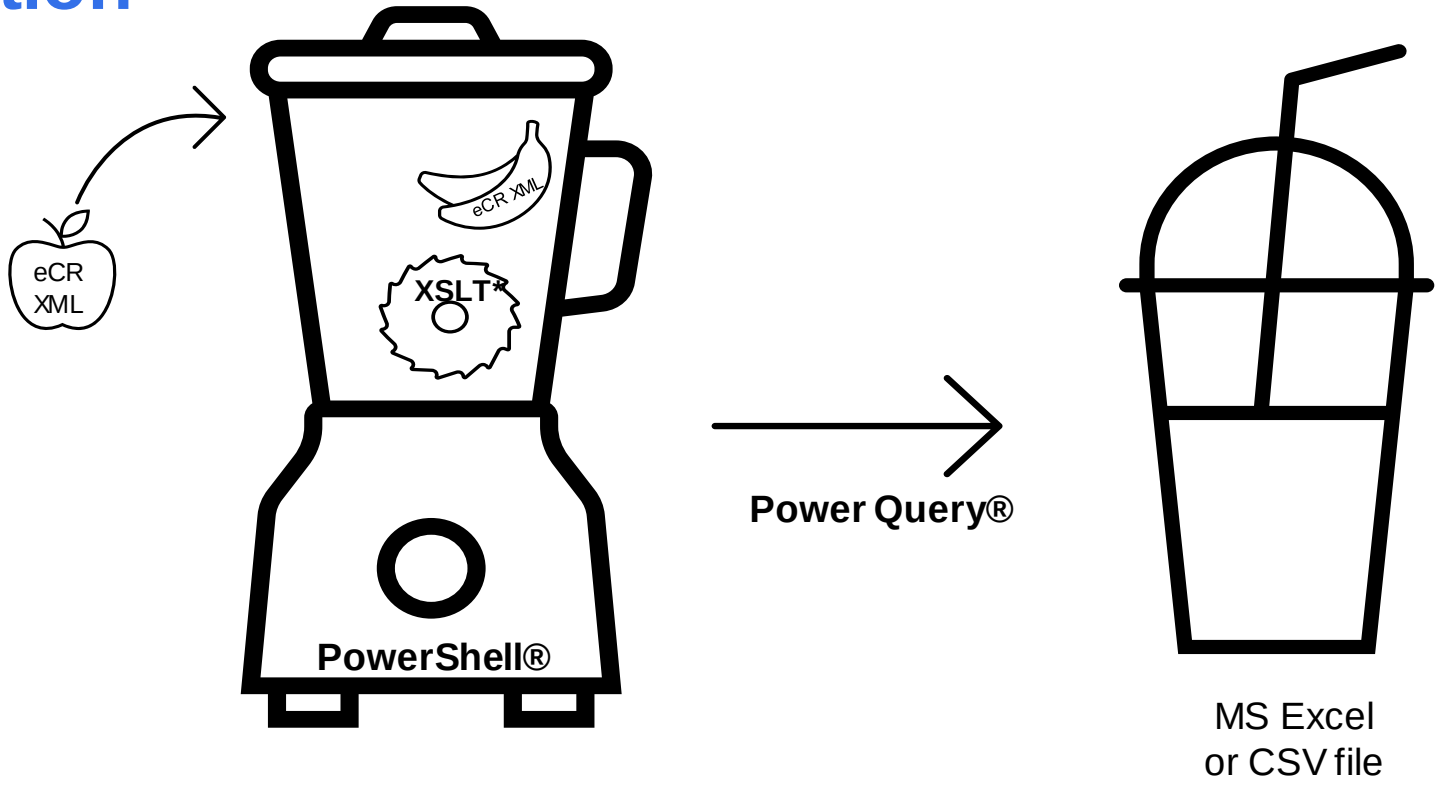
Challenges:

- No processing infrastructure
- Small team (2 people)
- At first, R access restricted
- Later, R scripts were slow
- DQ Schematron issues

Needs:

- Testing
- Data validation
- Quality Assurance
- Efficiency

# Solution




* XSLT= Extensible Stylesheet Language Transformations

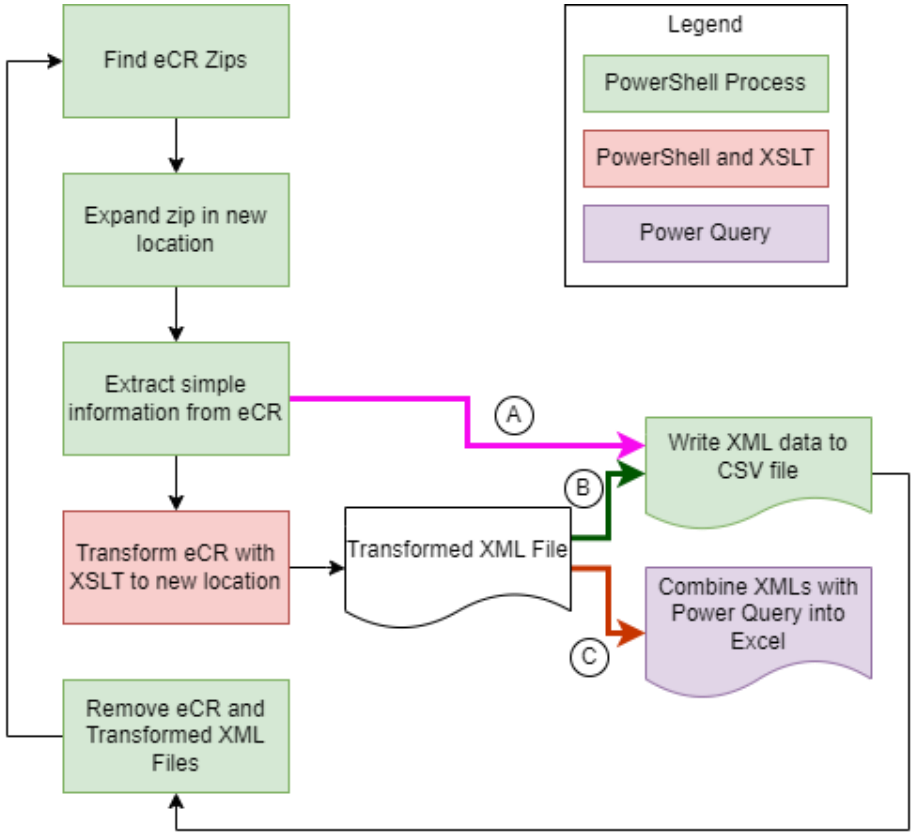
# How did we do it?

Three methods used:

**A. Pull variables from eCR to CSV**
Good for **simple, non-repeating** elements

**B. Transform eCR and Write to CSV**
Good for elements that can be **repeating**. Can be made very specific.

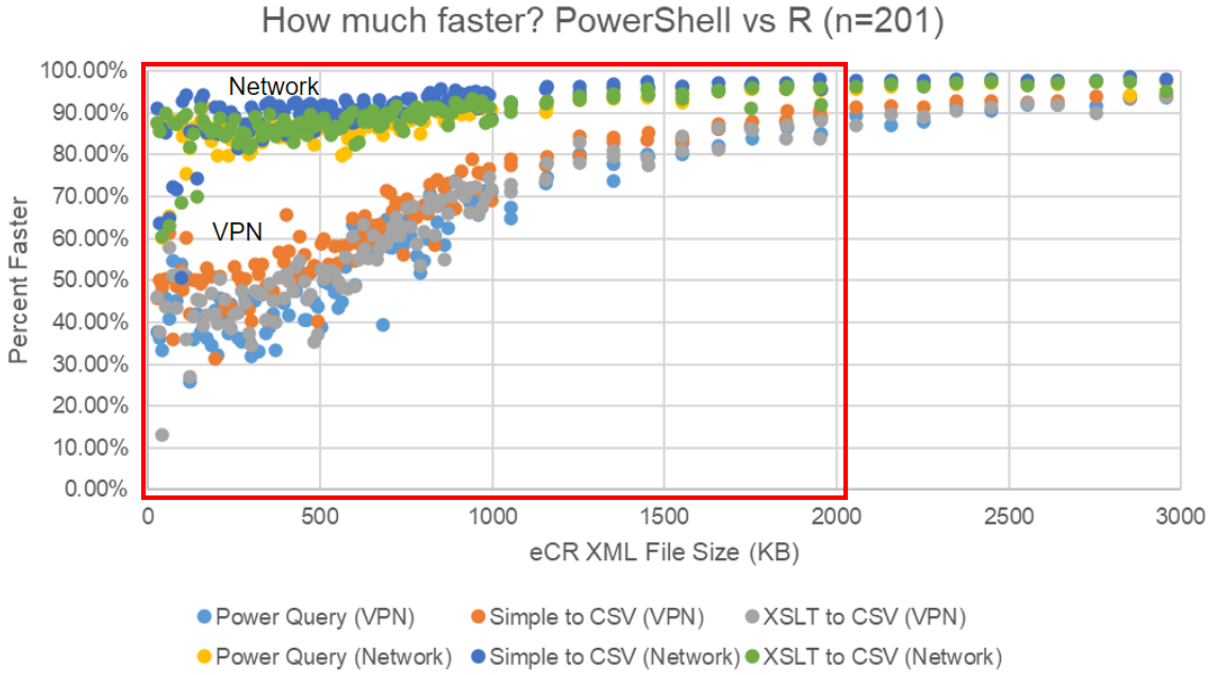
**C. Transform eCR and use Power Query® to combine output XMLs**
Good for **displaying** repeating elements (meds, problems, etc.). Can be very specific if needed.



# Efficiency

Parsing the same elements: PowerShell® compared to R

- >**3X faster** over VPN
- >**16X faster** on the state network



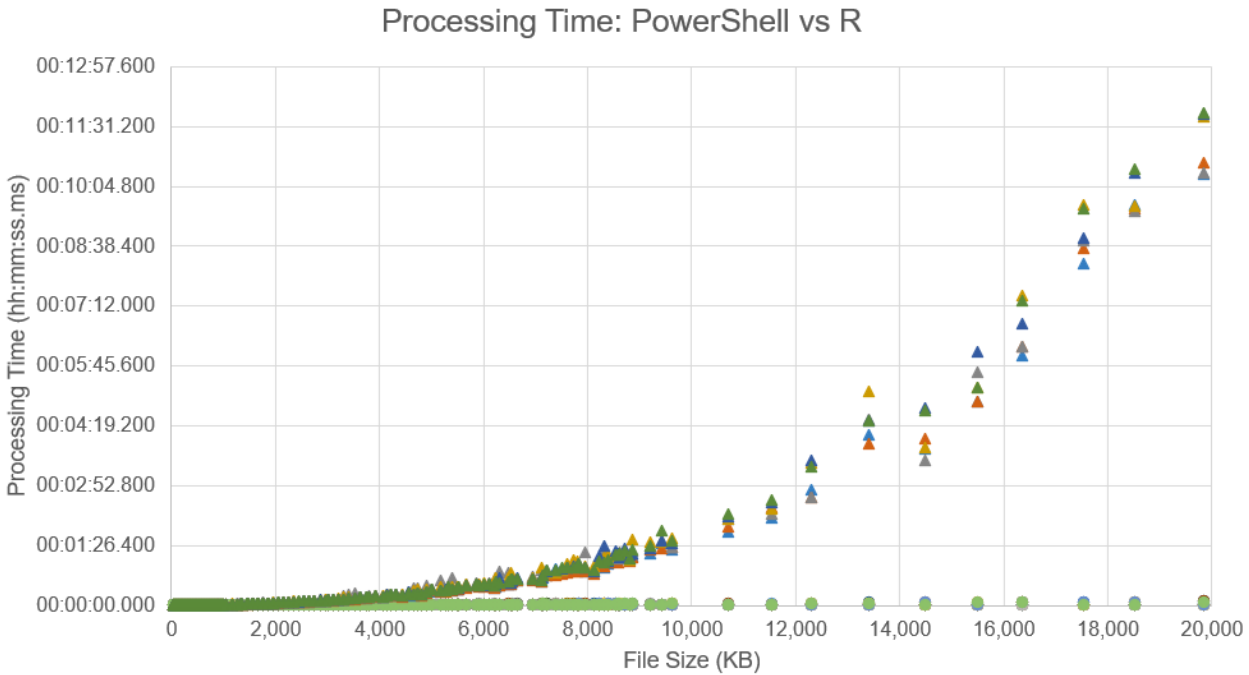

Approx. >90% of eCRs will fall between 0-2000KB
(based on a 3-month sample period)

# Speed

Maximum File Processing Time

PowerShell = 6.4 seconds

R = 11 min 50 sec



# Utility

- It worked!
- Compared elements across different senders
- Functions as a sandbox for testing Xpaths
- **Able to test rules not in DQ Schematron**

| Sender | Count of eCRs | Ordered Lab Tests | Planned Procedures | Ordered Lab Tests per eCR | Planned Procedures per eCR |
|---|---|---|---|---|---|
| HCO-A | 2,497 | 23,942 | 137 | 9.59 | 0.05 |
| HCO-B | 10,276 | 0 | 51,319 | 0.00 | 4.99 |
| HCO-C | 104 | 0 | 863 | 0.00 | 8.33 |
| HCO-D | 858 | 4,010 | 1,864 | 4.67 | 2.17 |

eCRs received from 01Jan24-01Mar24

# Flexibility

- Search for filename and copy to a new location
- Search for condition codes in RR
- Transform eCRs into extracted HTMLs for staff
- Compare codes in eCRs to surveillance system mappings using look up documents
- Make your script talk and freak out your coworkers

```
Add-Type -AssemblyName System.Speech
$synth = New-Object -TypeName System.Speech.Synthesis.SpeechSynthesizer
$synth.SelectVoice("Microsoft David Desktop")
$synth.Speak("Your script is done, and I am a sentient machine. Bow down to the computer overlords.")
```

# Conclusion

- [x] Alternative to R scripts
- [x] Validation/ QA/ Testing
- [x] Efficient and Fast
- [x] A Usable Option

# Thank You

- Lynn Sosa, MD
- Sue Speers, MPH
- Nancy L Barrett, MPH MS
- Informatics Team
- CSTE

# Contact and Resources

**Mike Schneider**
CT Dept of Public Health
Michael.Schneider@ct.gov
DPH.eCRInformatics@ct.gov

https://github.com/mikeeschneider/CSTE2024