

FHIR Queried vs. Manually Submitted Birth Certificate Data: Lessons Learned

MICHIGAN DEPARTMENT OF HEALTH & HUMAN SERVICES
& ALTARUM INSTITUTE



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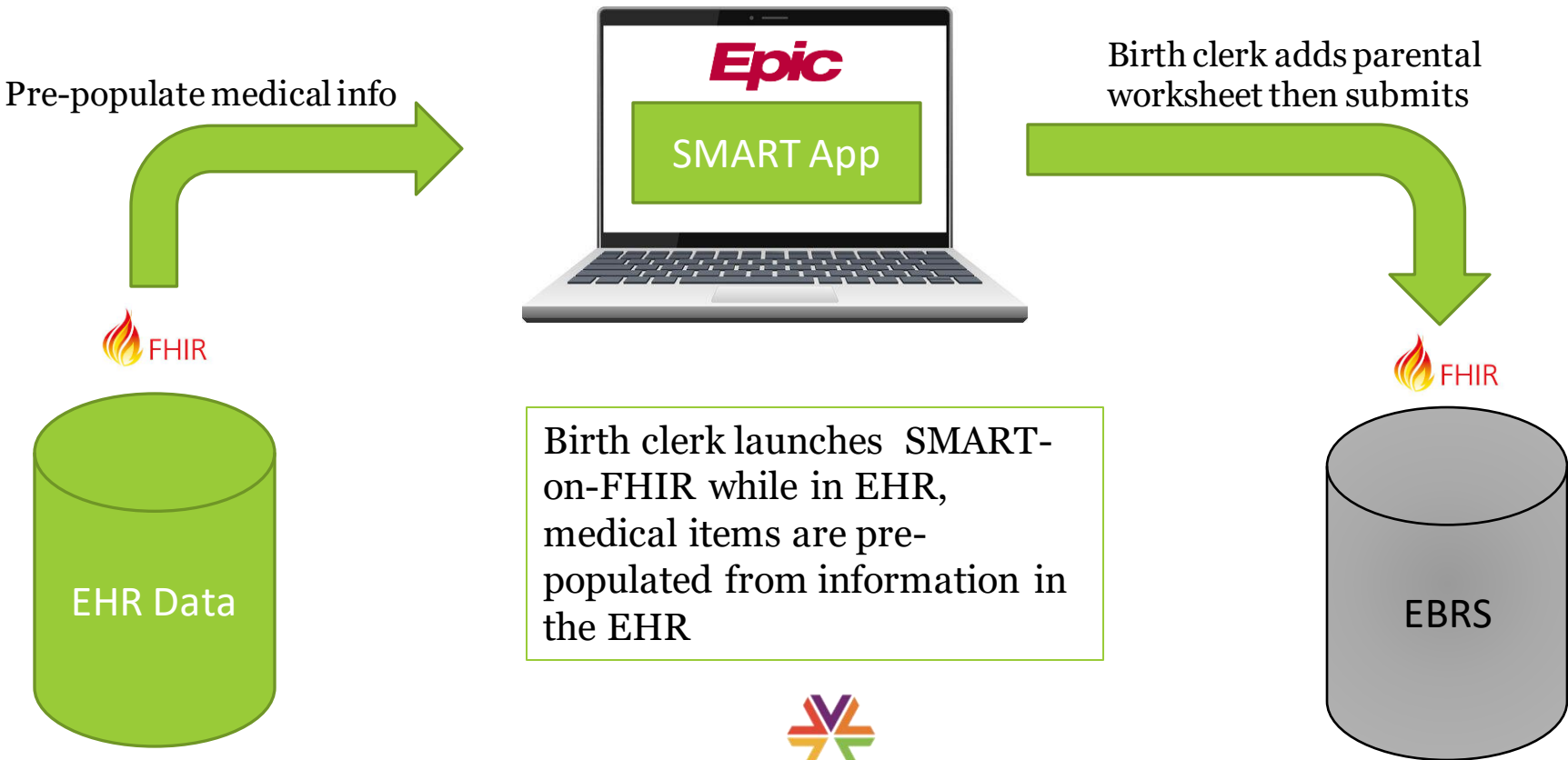


Putting people first, with the goal of helping all Michiganders lead healthier and more productive lives, no matter their stage in life.

Key Points

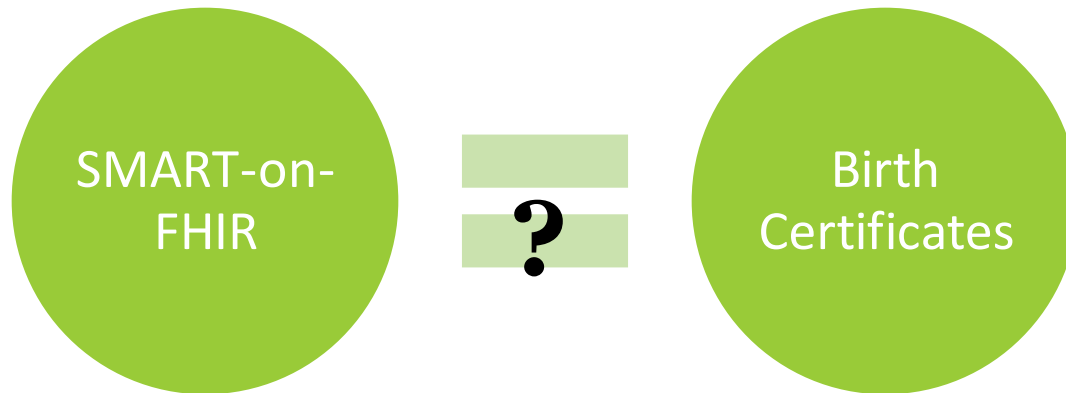
- ❑ Electronic Birth Reporting is a good example of how manual efforts are required to transfer information from one electronic system to another.
- ❑ HL7 FHIR is increasingly the preferred means of exchanging health care electronic health data across systems
- ❑ This project compared the quality of birth reporting information extracted via FHIR queries against the same birth event information manually entered by birth clerks at three Michigan hospitals
- ❑ Our findings show the promise and current limitations of using FHIR to mine the wealth of data available in Electronic Health Records

SMART-on-FHIR



Will it work for birth certificates?

Need to test SMART-on-FHIR compared to a sample of birth certificates



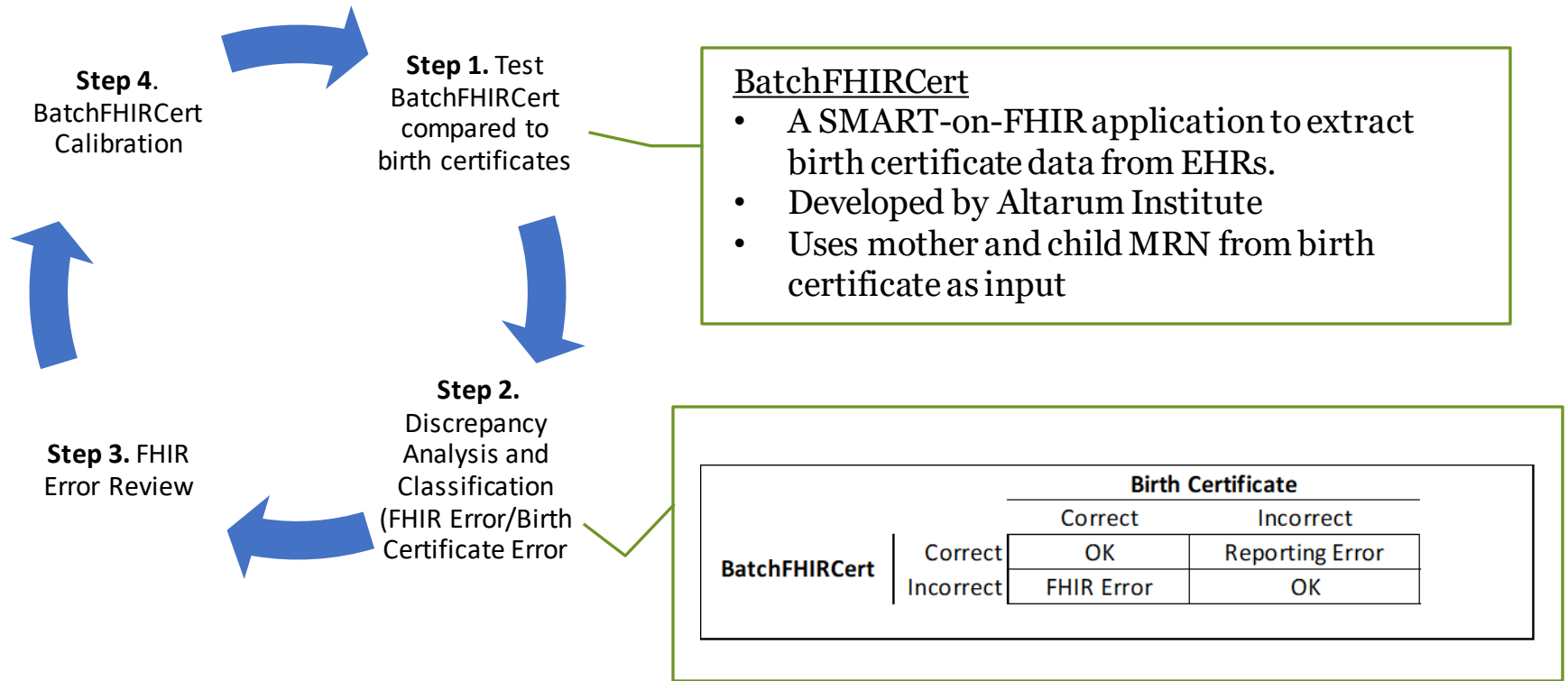
- ❖ Michigan and Utah collaborated on a CDC funded task order proposal to build and test SMART-on-FHIR apps in different EHR platforms
- ❖ Uniform sampling design, data elements, analysis

BatchFHIRCert



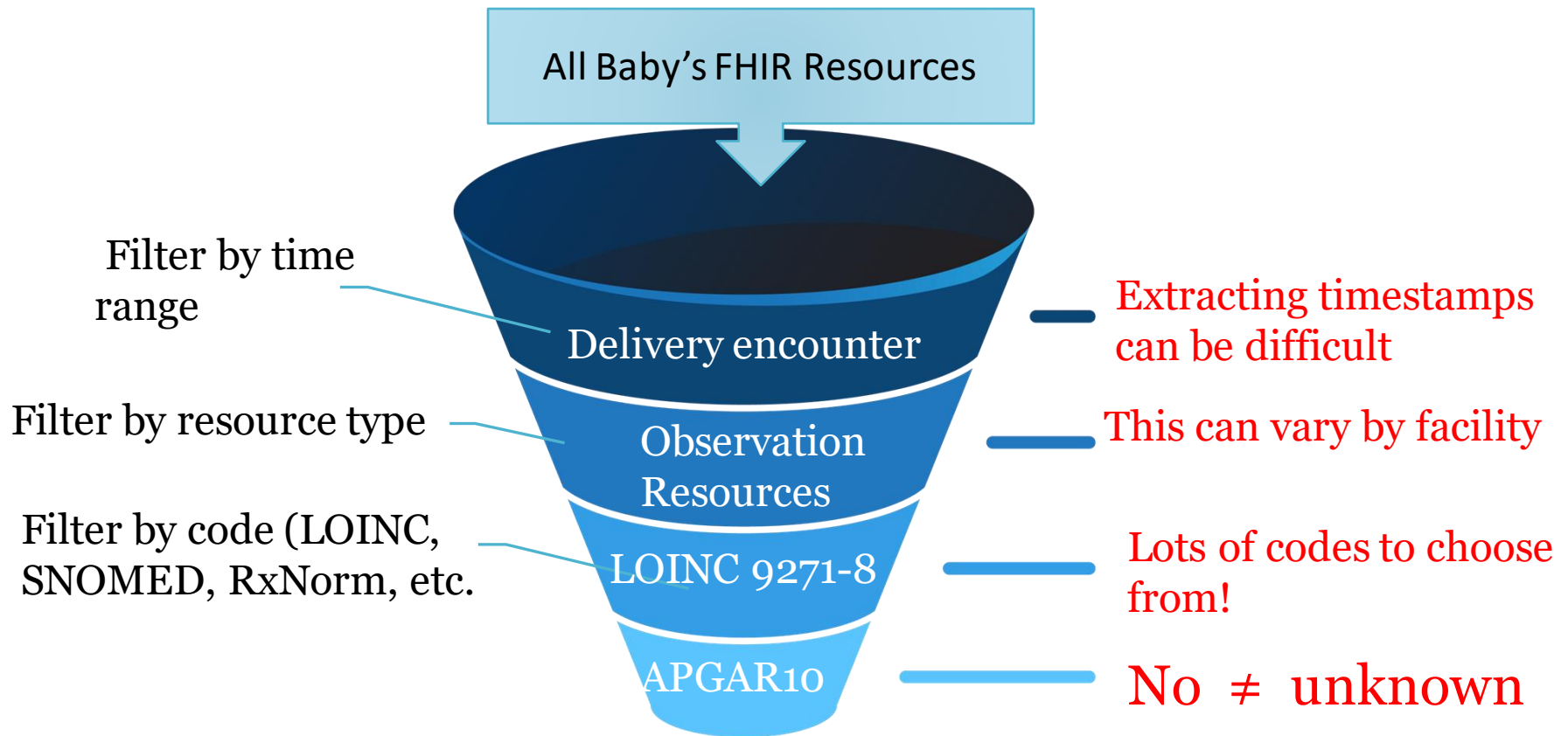
- ❑ Developed by Altarum Institute
- ❑ Searches EHR using mom/baby MRNs or demographic info
- ❑ Two rounds of testing at 3 Michigan Hospitals in late 2022-early 2023
- ❑ Objectives:
 - ❑ To compare the information extracted by SMART-on-FHIR to that reported by hospital birth certificate clerks
 - ❑ To learn how and where relevant information is stored in EHR and if it can be found through FHIR

Testing and Calibration Process



- Two rounds of testing at the three Michigan facilities, August 2022-March 2023

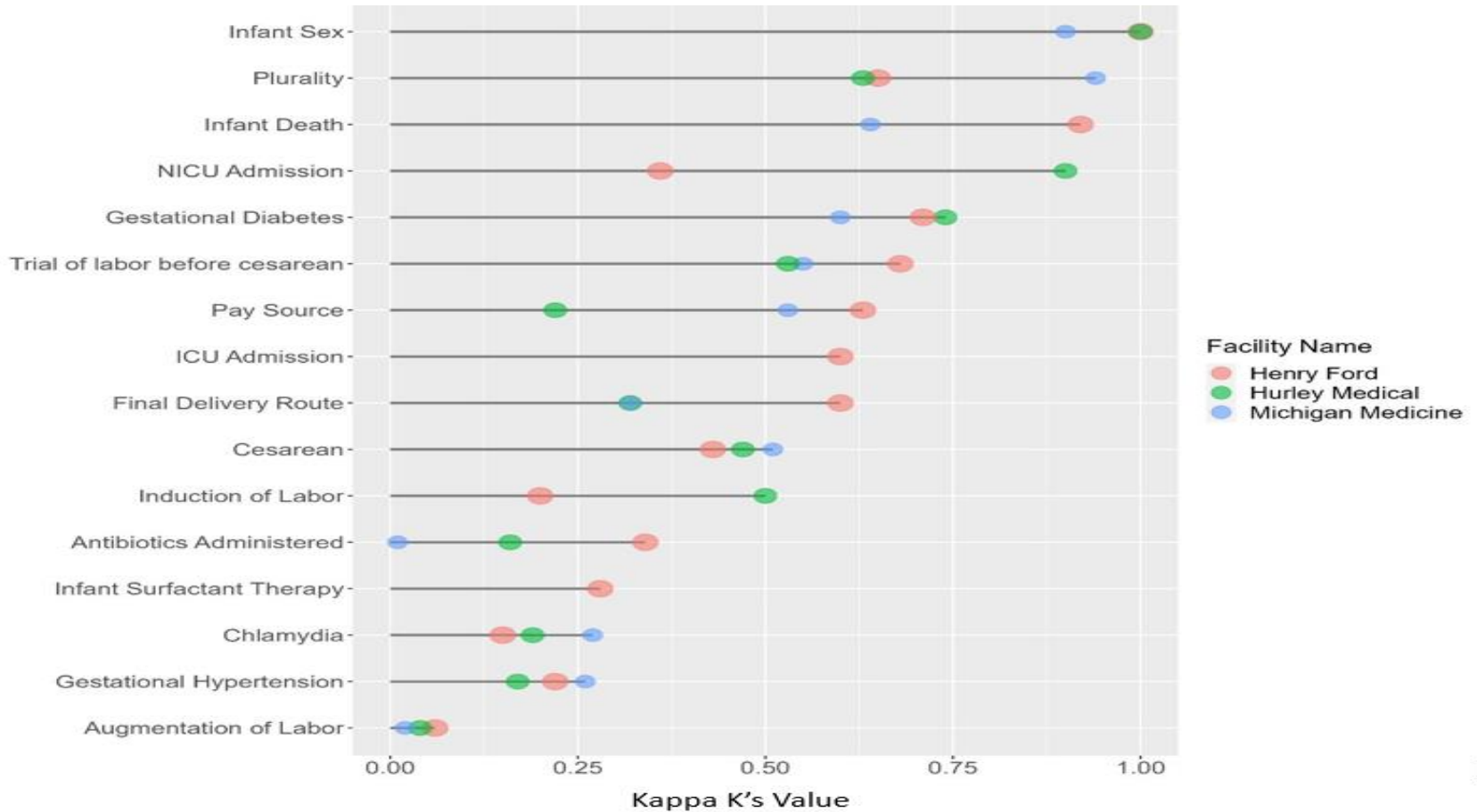
Filtering by time, resource, and code



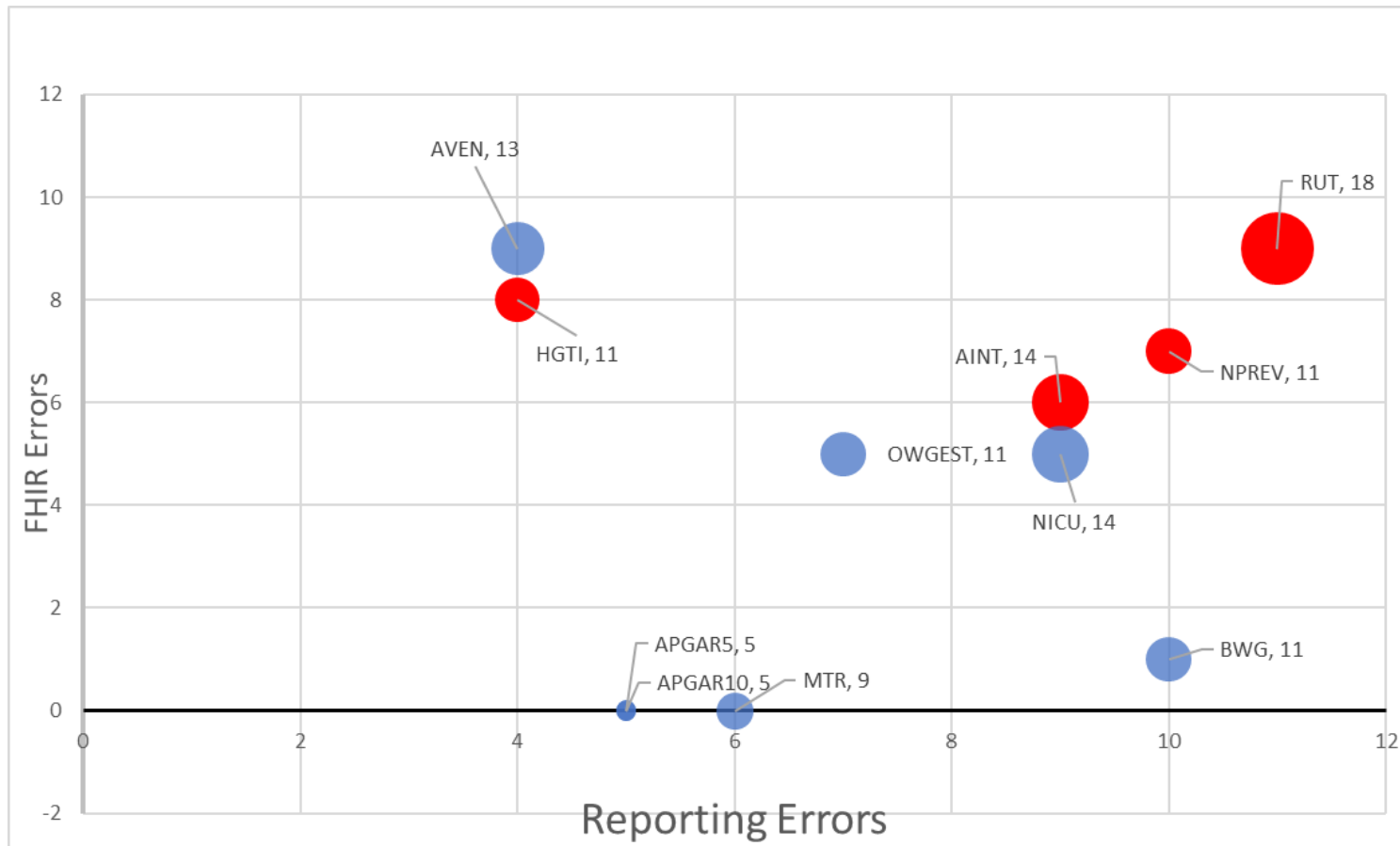
Round 1 Results

1

2



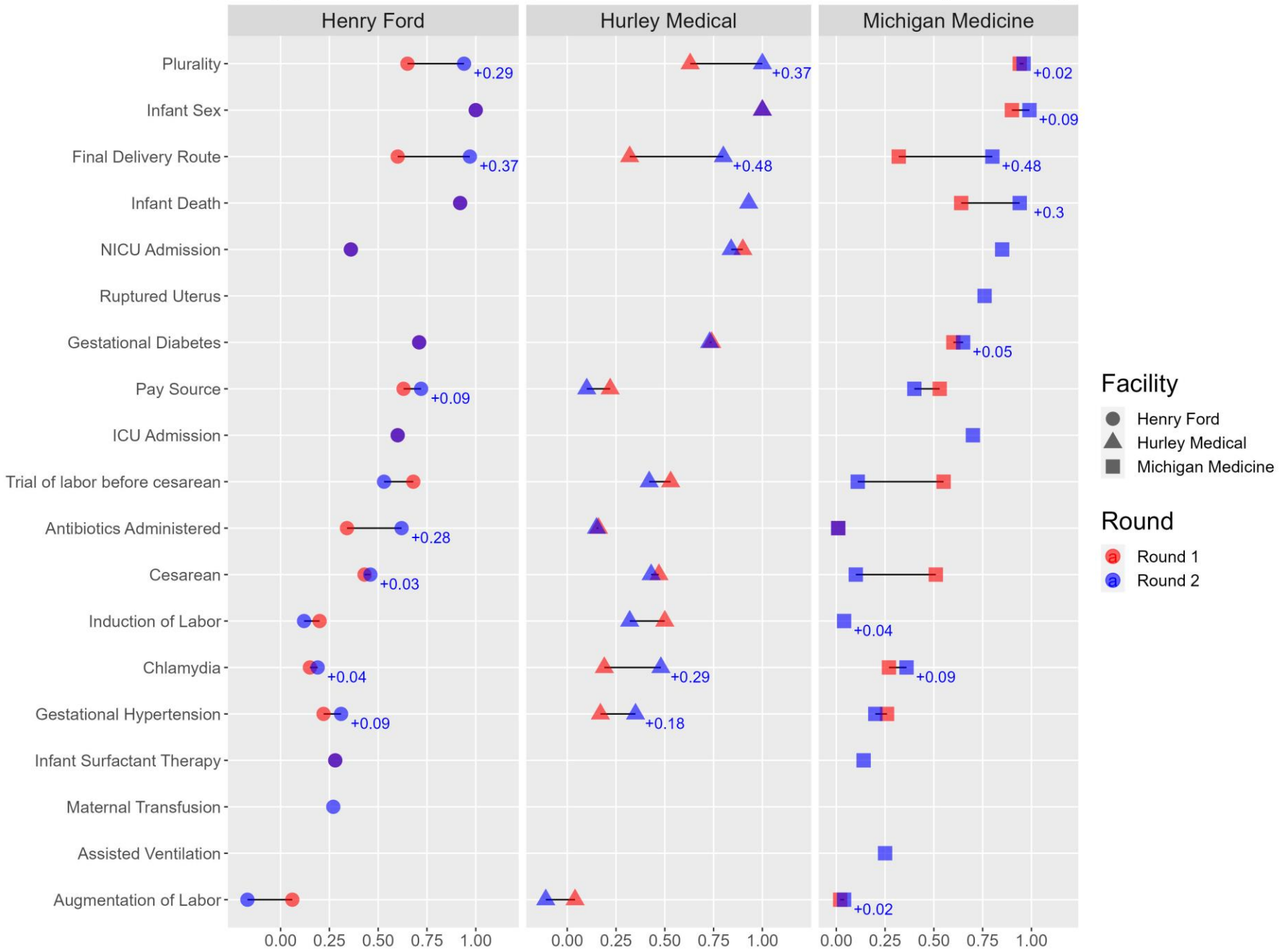
Discrepancy Analysis



● Mother

● Child

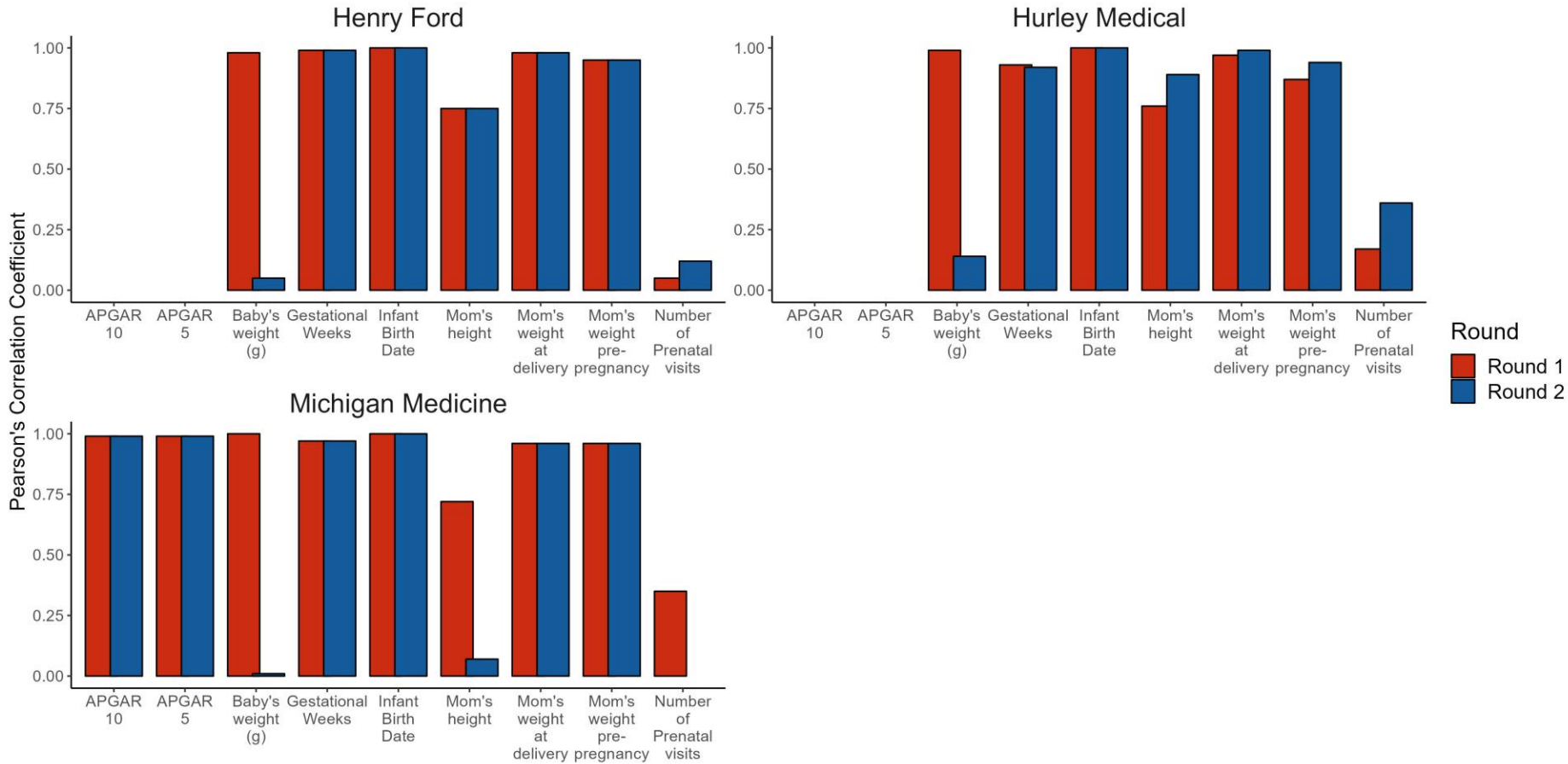
Kappa Statistic Comparison of Select Variables by Facility



Quantitative Results



Pearson's Correlation Comparison Between Rounds by Facility



Maternal morbidity

Ruptured Uterus

- 0 reported on BC
- FHIR found 14
- 3 confirmed

Maternal transfusion

- 0 reported on BC
- FHIR found 13
- 3 confirmed

Mother admit to ICU

- FHIR identified 3 missed by BC

- FHIR appears to have great specificity
- FHIR does not yet have great sensitivity

Pre-population vs. Decision Support

Pre-populate

- Apgar scores
- Infant living
- OB estimate gestational age
- Sex
- Plurality
- Surfactant
- Pre-preg birth weight
- Infant DOB
- Gestational Diabetes

Decision Support

- Induction/Augmentation
- Trial of Labor
- Antibiotics during labor
- Source of Payment
- Mother's height
- Ruptured Uterus
- Maternal Transfusion
- Mom ICU Admission
- NICU admission
- Assisted Ventilation
- Gestational hypertension

Key findings

- ① All the data items we searched for are in the EHR
- ② Considerable variation across facilities
- ③ Birth clerks are wrong way too often
- ④ Changes in the EHR can cause problems
- ⑤ FHIR has high specificity

Status and Next Steps

- Working with Altarum to create app (FHIRCert) in Epic App Orchard for full pilot
- Working with VitalChek to interface with DAVE
- Once live in Epic App Orchard, FHIRCert can be leveraged in other jurisdictions

Pursuing a full pilot of BFDR SMART-on-FHIR as an optional activity under ELC Tier 3

- Birth Certificate Quality Improvement Project !

Acknowledgments

- National Center for Health Statistics
- Altarum Institute
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- Michigan Medicine, Ann Arbor MI

Questions:

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