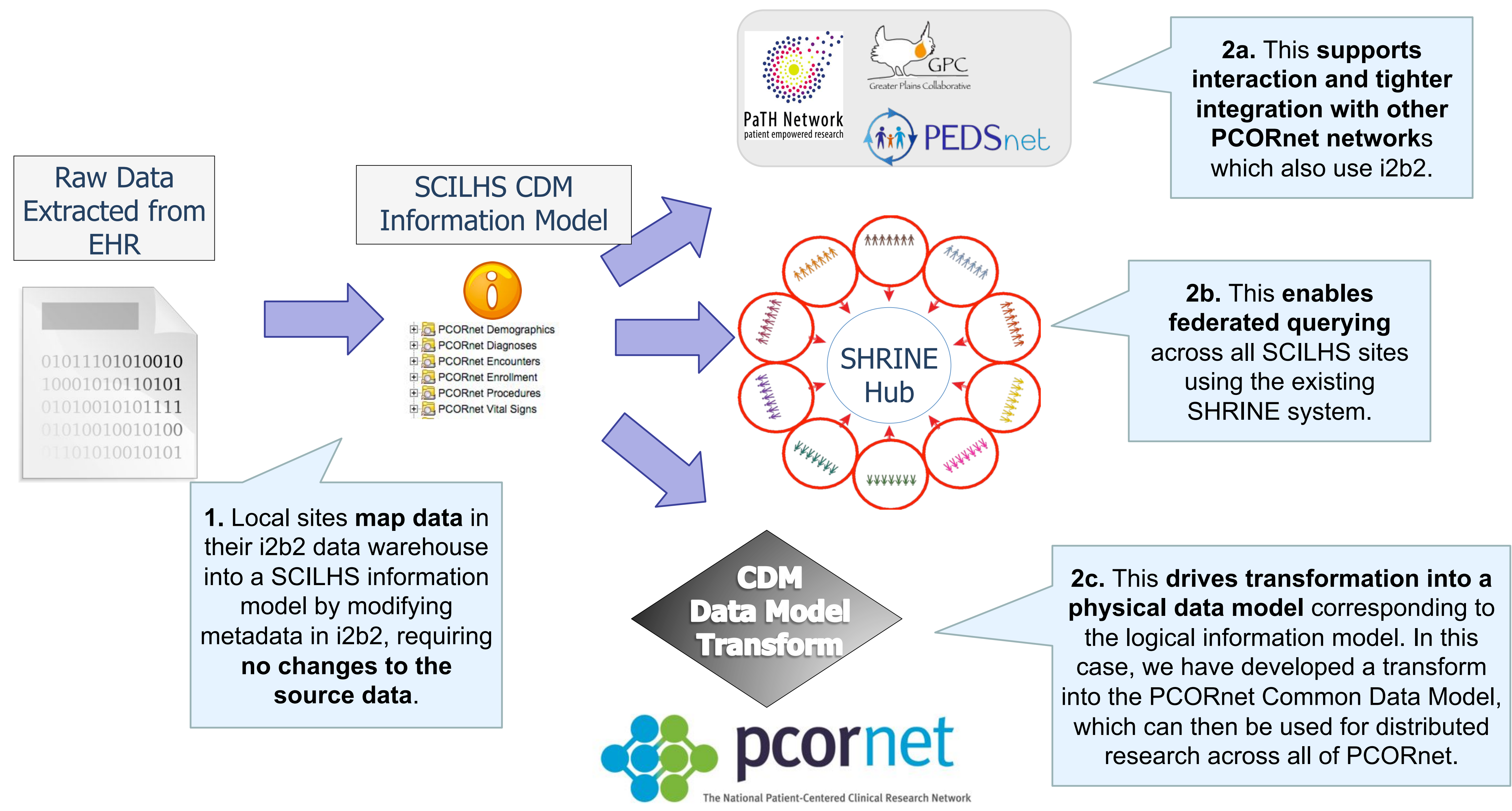


Background

- The **Patient Centered Outcomes Research Institute's Patient-Centered Clinical Research Network (PCORnet)** is a national effort to instantiate a national 'network of networks' that supports large-scale comparative effectiveness research.
- The **Scalable Collaborative Infrastructure for a Learning Health System (SCILHS)** is a PCORnet network run by Harvard Medical School with ten hospital sites across the US.
- Informatics for Integrating Biology and the Bedside (i2b2)** is an NIH open source clinical data analytics platform, used at over 100 sites worldwide including one-third of PCORnet and the entire SCILHS network.
- To enable distributed research across the network, PCORnet has defined a **Common Data Model (CDM)**, but this still requires robust approaches to transforming local data into the CDM.

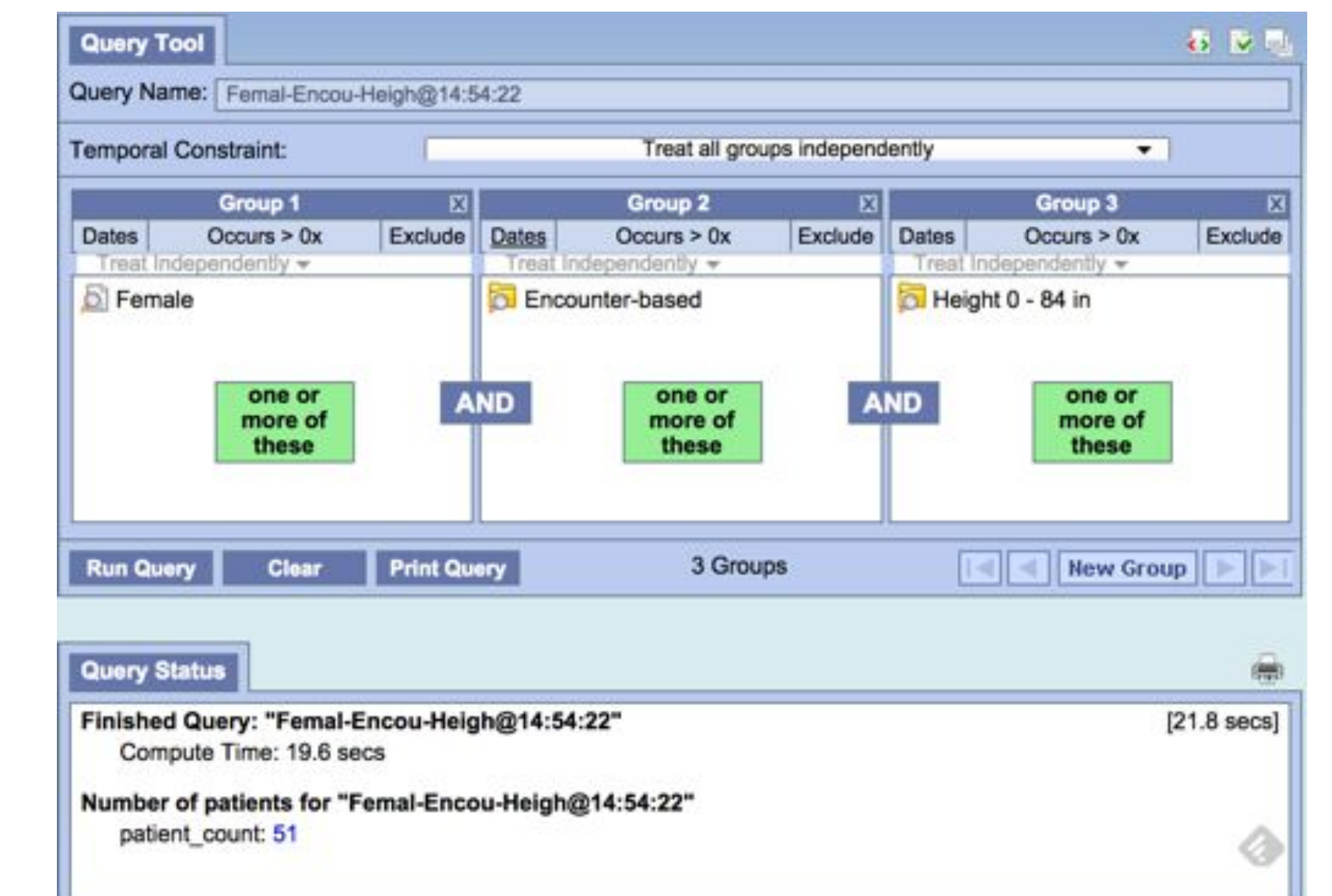


PCORnet i2b2 Information Model



Results and Discussion: Interoperable Querying

- Our seven core SCILHS sites have **mapped the majority of their data to the CDM Information Model, and inter- and intra- network queries** are coming online presently.



A query on fake test data mapped to the SCILHS' Information Model, for females of normal height who received care in the network (were 'Enrolled').

- Three other PCORnet networks** which use i2b2 have agreed to use an Information Model derived from SCILHS', which will allow the three networks to effectively operate as one.
- The **Accrual to Clinical Trials network** is using an expanded version of our SCILHS Information Model to also support interoperability.
- The methodology uses **standard, popular, freely available** components.
- The SCHILS Information Model is **available to beta testers on request**, and it **can be viewed from the i2b2 demo website** by logging in as username pcori -- <http://www.i2b2.org/webclient>

Future Work

We hope to extend our tools to support transformation of i2b2 data into other standard formats for exchange with patients and other PCORnet networks.

Materials and Methods

- We have developed a robust approach for creating common **i2b2 Information Models** and mapping local data into them. Our approach allows the source data to **remain unchanged**.
- An i2b2 information model is defined by **hierarchical i2b2 pathnames**, which assign a standard semantic meaning to each data element.
- Implementers modify other columns in the i2b2 metadata table, so that the standardized pathnames map to the local data. We have developed an i2b2 information model that defines all elements in **PCORnet's Common Data Model**.
- The Information Model allows research to be performed **across the SCILHS network**, through an existing distributed i2b2 query system (SHRINE).
- We have developed SQL scripts which generate **PCORnet Common Data Model Tables** using the pathnames in the information model to determine data location in i2b2. This enables querying across non-i2b2 networks in PCORnet by enabling direct interoperability with the PopMedNet-derived PCORnet Distributed Research Network client.

Mapping Approaches: Modifying the Information Model Metadata Table

White

c_fullname
 \PCOR\DEMOGRAPHIC\RACE\05\
c_dimcode
 'his/white','hiw','c','w','white','m','mid.eastern'

To map data in the patient and and encounter dimensions, augment the value list in the dimcode with local values.

Diabetes Mellitus

Code renaming
 \PCOR\DIAGNOSIS\09\001-999.99\240-279.99\249-259.99\250\
c_basecode
 ICD9:250
 PHSICD9:250

If codes are different but have a 1:1 mapping with PCORnet CDM, change the basecode to match the local code.

Hispanic

Local children

C_VISUAL ATTRIBUT C_BASECODE
 FAE ETHNICITY:HISPANIC
 LAE ETH:HISP
 LAE ETH:LAT

If a particular PCORnet code maps to several local codes, create these as children underneath that PCORnet code. Queries will automatically gather all the local codes.

We have developed a mapping tool to assist in adding local codes.

The hierarchical pathname defines the information model, and the three methods above map the pathname to local data, through modifications of the metadata table.

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