**Linking UNC EMR data to Insurance Claims**

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| **Stage** | **Activities** | **Medicare** | **NC Medicaid** | **BCBSNC** |
| 1 | Design linked EHR/claims study including selection of claims data sources for linkage  Consult w/ Tracs CER SI re: cost and timelines for use of linked claims data (in parallel with design)  Consult with Sheps Center re: linkage process as well as expectations, costs, and timeline for honest broker data linkage work  Consult w/ Tracs Bioinformatics re: cost of data extraction from CDW | | | | |
| 2 | Prepare Research Plan and budget | | | | |
| 3 | Submit research plan to [UNC IRB](https://irbis2.research.unc.edu/) for review and approval  While awaiting IRB approval, prepare request(s) for [permission to use data from CDW](https://tracs.unc.edu/index.php/services/comparative-effectiveness-research/databases) (see Tracs website for form) | While awaiting IRB approval, prepare request(s) for permission to use data from **Medicare**, (see Amy Lowman) | While awaiting IRB approval, prepare request for permission to use data from **NC Medicaid** (see Abigail Haydon) | While awaiting IRB approval, prepare request for permission to use data from **BCBSNC** (see Abigail Haydon) |
| 4 | Submit proposed research to UNC’s [CDW Oversight review and approval](https://tracs.unc.edu/cdwh-project-review-request) | While awaiting CDW approval, submit draft materials for ResDAC for review. Expect revisions, then obtain signatures, and finally submit to CMS (via ResDAC) for formal review/approval. | While awaiting CDW approval, submit draft materials for Sheps / DMA for review. Expect revisions before materials go to DMA for review/approval. | While awaiting CDW approval, submit draft materials for Sheps/BCBSNC for review. Expect revisions before materials go to BCBSNC for review/approval. |
| 5 | Once approved by CDW and IRB, Tracs analyst identifies records that meet eligibility criteria (based on computable phenotype) | | | | |
| 6 | Tracs analyst prepares list of patids (+/- additional identifiers for linkage) for claims data specific process: | If linking to **Medicare**, patids from CDW used by study programmer to identify individuals who are linkable via existing crosswalk file on Sheps Secure Server | If linking to **NC Medicaid**, finder file sent to NC DMA for linkage to encrypted beneficiary IDs. Crosswalk between patid and encrypted Medicaid ID returned to honest broker at Sheps who extracts claims for those individuals who match, and then provides study personnel with access on Sheps Secure Server | If linking to **BCBSNC**, honest broker at Sheps will use identifiers from CDW to link to member enrollment data from BCBSNC. Honest broker at Sheps extracts claims for those individuals who match, removes any sensitive identifiers from the claims data files, and provides access to study personnel on Sheps Secure Server |
| 7 | Tracs analyst extracts data from CDM or EPIC needed for research question and provides access to research team | | | | |
| 8 | Study programmer creates analytic dataset(s) using EMR and claims | | | | |
| 9 | Research personnel conduct statistical analysis, generate aggregate results, and ultimately manuscripts / presentations | | | | |

**Funding Considerations**

* **Cost to extract data from CDW**: If all EHR data elements are contained in the PCORnet common data model, cost is modest. Extraction of data from the CDW that are not contained in the CDM requires custom programming. For linkage to NC Medicaid or BCBSNC, identifiers are needed to link and these are not in the CDM. Analyst time charged at $75/hr after 4 hrs per project. Request consultation / cost estimate from NC Tracs Bioinformatics.
* **Cost for linkage to BCBSNC** via Sheps Honest Broker: $70/hr. The number of hours depends on the size of the cohort to be linked and the importance of maximizing the percentage of individuals who can be retained in the linked dataset (typically <80 hrs). Request cost estimate from Roger Akers, Sheps Center.
* **Use of Sheps Secure Server**: $3050/account/year with reduced fee for students; waivers may be granted for unfunded research. All linked data must be housed in the Sheps environment and cannot be moved or copied out of that environment. Direct questions regarding establishing access to Abigail Haydon. Questions regarding waivers should be directed to Roger Akers, Sheps Center.
* **Medicare reuse**: cost for reuse only (no new data): $2000; except for dissertation studies (no charge). If you anticipate amending the reuse to include future years of data that are not currently part of the Master DUA, each amendment will also incur a $2000 fee payable to CMS. Direct questions re: process to Amy Lowman or Michele Jonsson Funk.
* **Programmer effort** for extracting claims, creating analytic files, and producing aggregate results varies by project. At this time, claims data are not in the PCORnet Common Data Model and therefore standardized SAS queries cannot be used for studies involving linked data. Request cost estimate from Tracs CER SI (Abigail Haydon).

**Claims Data Descriptions**

**Medicare**

http://www.shepscenter.unc.edu/data/medicare-data-20-sample/database-description/

The Medicare data includes 20 percent of all Medicare beneficiaries age 65 years and older with fee-for-service coverage of Medicare Parts A, B, and D. Beneficiaries are included in the data set if they have simultaneous coverage of Parts A, B, and D for at least one calendar month in 2007-2015. Once a beneficiary meets these selection criteria, all available fee-for-service claims data and death data are included from that point through the end of 2015. The data are updated yearly using the same sampling scheme for each year. There is an approximate 2 year lag for updating.

In addition to the national 20% sample, we also have Medicare claims for all fee-for-service beneficiaries who had one or more visits at any of the sites in the UNC Health System across North Carolina between April 1, 2014 and November 2017. These claims are currently available for 2015, and 2016 claims are expected in Summer 2018.

**NC Medicaid**

<http://www.shepscenter.unc.edu/data/bcbsnc-claims-data-ccqi/database-description/>

The NC Medicaid database contains claims data from the North Carolina Department of Health and Human Services Division of Medical Assistance.

The database includes the following:

* Claims information (including doctor visits, inpatient and outpatient care, prescription medications, dental treatments, charge amounts, dates of service, and diagnoses and procedures).
* Provider information (including specialty and location).
* Member information (including date of birth, gender, county/ZIP code of residence, race and ethnicity).

Dates available: January 2011 – December 2017 (as of 6/15/2018)

**Blue Cross Blue Shield of North Carolina (BCBSNC)**

<http://www.shepscenter.unc.edu/data/bcbsnc-claims-data-ccqi/database-description/>

The BCBSNC database contains claims data on health care services reimbursed by BCBSNC. The database includes claim records from insured groups, administrative services only (ASO) groups, and individual market and Affordable Care Act Exchange Plans.

The database includes the following:

* Claims information (including doctor visits, inpatient and outpatient care, prescription medications, dental treatments, charge amounts, dates of service, and diagnoses and procedures).
* Provider information (including specialty and location).
* Member information (including date of birth, gender, county/ZIP code of residence).

Dates available: January 2006 – March 2017 (as of 6/6/2018)