Specification for ETL
from OMOP CDM v5 to PCORnet CDM v3

Revision Date: April 7, 2016

Versions

4/7/2016	Toan	Added the version table
5/5/2016	Don Torok	Added section for Death and Death Cause
8/25/2016	Toan	Added Dispensing
12/19/2016	Don Torok	Reconciled with Conventions Document

Table of Contents

1.0 Introduction

The purpose of this document is to provide a mechanism for PCORnet data partners to communicate information about how they transformed data stored in OMOP Common Data Model (CDM) Version 5 format into the PCORnet Common Data Model (CDM) Version 3.0. To describe how the information will be used to help the PCORnet Coordinating Center better understand the transformation process, appropriate uses of the PCORnet data, and the comparability of data sources. This document details the approach used for the Extract, Transform, and Load (ETL) process to transform OMOP CDMv5 data elements to the data elements in the PCORnet CDM Version 3.0.

The document, 2015-06-01-PCORnet-Common-Data-Model-v3dot0-RELEASE.pdf, should be used in conjunction with this document, as the PCORnet Common Data Model has the data types and descriptions of the PCORnet tables.

This document assumes that the conventions outlined in CDRN Conventions for Populating OMOP CDM were followed in populating the OMOP CDMv5 database. It also requires that OMOP Vocabulary 5 or later be used for the ETL.

2.0 Source Data Mapping Approach

This document describes mapping of the target PCORnet Common Data Model (CDM) tables and columns from source OMOP CDM model v5.

The mapping was designed based on OMOP CDM v5 specification, PCORnet CDM v3 specification and Conventions for Populating OMOP CDM v5 for PCORnet v3. The mapping should provide sufficient information in order to design and develop ETL processes.

3.0 Source Data Mapping

This section describes mapping process and ETL conversions for transforming data from an OMOP CDM (source) to a PCORNet CDM (destination).

3.1 Data Mapping

Data mapping expects source and target data to be stored in any conventional relational database system per OMOP CDM v5 and PCORNet CDM v3 specifications respectively.

3.1.1 Table: Demographic

PCORI DEMOGRAPHIC table contains one record per patient. Load Demographic data from OMOP Person table as described below.

Demographic field mapping:

<table>
<tr><th>Destination Field</th><th>Source Field</th><th>Applied Rule</th><th>Comment</th></tr>
<tr><td>PATID</td><td>Person.person_id</td><td></td><td>Convert to text</td></tr>
<tr><td>BIRTH_DATE</td><td>Use Person.year_of_birth, month_of_birth and day_of_birth to construct date. Substitute month and day (each) as '01' if not available in the source.</td><td></td><td>Changed to date data type.</td></tr>
<tr><td>BIRTH_TIME</td><td>Person.time_of_birth</td><td>Use NULL if not available</td><td>Convert to text format ‘HH:MI’ using 24-hour clock and zero-padding for hour and minute</td></tr>
<tr><td>SEX</td><td>Person.gender_concept_id
Char 2</td><td>
<table>
<tr><th colspan="2">OMOP to PCORnet</th></tr>
<tr><td>44814664</td><td>A = Ambiguous</td></tr>
<tr><td>8532</td><td>F = Female</td></tr>
<tr><td>8507</td><td>M = Male</td></tr>
<tr><td>44814650</td><td>NI = No information</td></tr>
<tr><td>44814653</td><td>UN = Unknown</td></tr>
<tr><td>44814649</td><td>OT = Other</td></tr>
<tr><td>0</td><td>NULL</td></tr>
</table>
</td><td>
<table>
<tr><th colspan="2">OMOP Concepts</th></tr>
<tr><td>44814664</td><td>Ambiguous</td></tr>
<tr><td>8532</td><td>Female</td></tr>
<tr><td>8507</td><td>Male</td></tr>
<tr><td>44814650</td><td>No Information</td></tr>
<tr><td>44814653</td><td>Unknown</td></tr>
<tr><td>44814649</td><td>Other</td></tr>
<tr><td>0</td><td>Field does not exist in the source</td></tr>
</table>
</td></tr>
<tr><td>HISPANIC</td><td>Derive from Person.ethnicity_concept_id</td><td>
<table>
<tr><th colspan="2">OMOP to PCORnet</th></tr>
<tr><td>38003563</td><td>Y = Yes</td></tr>
<tr><td>38003564</td><td>N = No</td></tr>
<tr><td>44814650</td><td>NI = No information</td></tr>
<tr><td>44814653</td><td>UN = Unknown</td></tr>
<tr><td>44814649</td><td>OT = Other</td></tr>
<tr><td>0</td><td>NULL</td></tr>
</table>
</td><td>
<table>
<tr><th colspan="2">OMOP Concepts</th></tr>
<tr><td>38003563</td><td>Hispanic or Latino</td></tr>
<tr><td>38003564</td><td>Not Hispanic or Latino</td></tr>
<tr><td>44814650</td><td>No Information</td></tr>
<tr><td>44814653</td><td>Unknown</td></tr>
<tr><td>44814649</td><td>Other</td></tr>
<tr><td>0</td><td>Field does not exist in the source</td></tr>
</table>
</td></tr>
</table>

RACE	Derive from Person.Race_Concept_id		The mapping for Race from OMOP to PCORnet is given in a table below.
BIOBANK_FLAG	Observation.value_as_concept_id	If at least one record in Specimen table for the patient exist or in the Observation table observation_concept_id is 4001345 (Biobank flag) with value_as_concept_id = 4188539 (Yes) then set biobank_flag as 'Y' else 'N'	The allowable values are 'Y' or 'N'. The absence of a record indicates that there are no biobank specimens.
RAW_SEX	Person.gender_source_value		
RAW_ HISPANIC	Person.ethnicity_source_value		
RAW_RACE	Person.race_source_value		

OMOP to PCORnet Race Mapping

OMOP		**PCORnet**
concept	**description**	**Value**
38003600	African	03 = Black or African American
38003599	African American	03 = Black or African American
38003573	Alaska Native	01 = American Indian or Alaska Native
38003572	American Indian	01 = American Indian or Alaska Native
8657	American Indian or Alaska Native	01 = American Indian or Alaska Native
38003616	Arab	05 = White
8515	Asian	02 = Asian
38003574	Asian Indian	02 = Asian
38003601	Bahamian	03 = Black or African American
38003575	Bangladeshi	02 = Asian
38003602	Barbadian	03 = Black or African American
38003576	Bhutanese	02 = Asian
38003598	Black	03 = Black or African American

8516	Black or African American	03 = Black or African American
38003577	Burmese	02 = Asian
38003578	Cambodian	02 = Asian
38003579	Chinese	02 = Asian
38003604	Dominica Islander	03 = Black or African American
38003603	Dominican	03 = Black or African American
38003614	European	05 = White
38003581	Filipino	02 = Asian
38003605	Haitian	03 = Black or African American
38003582	Hmong	02 = Asian
38003583	Indonesian	02 = Asian
38003593	Iwo Jiman	02 = Asian
38003606	Jamaican	03 = Black or African American
38003584	Japanese	02 = Asian
38003585	Korean	02 = Asian
38003586	Laotian	02 = Asian
38003597	Madagascar	02 = Asian
38003587	Malaysian	02 = Asian
38003594	Maldivian	02 = Asian
38003612	Melanesian	04 = Native Hawaiian or OtherPacific Islander
38003611	Micronesian	04 = Native Hawaiian or OtherPacific Islander
38003615	Middle Eastern or North African	05 = White
8557	Native Hawaiian or Other Pacific Islander	04 = Native Hawaiian or OtherPacific Islander
38003595	Nepalese	02 = Asian
38003588	Okinawan	02 = Asian
38003613	Other Pacific Islander	04 = Native Hawaiian or OtherPacific Islander

38003589	Pakistani	02 = Asian
38003610	Polynesian	04 = Native Hawaiian or OtherPacific Islander
38003596	Singaporean	02 = Asian
38003590	Sri Lankan	02 = Asian
38003580	Taiwanese	02 = Asian
38003591	Thai	02 = Asian
38003607	Tobagoan	03 = Black or African American
38003608	Trinidadian	03 = Black or African American
38003592	Vietnamese	02 = Asian
38003609	West Indian	03 = Black or African American
8527	White	05 = White
44814659	Multiple Race	06 = Multiple Race
44814660	Refuse to answer	07 = Refuse to answer
44814650	No Information	NI = No information
44814653	Unknown	UN = Unknown
44814649	Other	OT = Other
0	Field does not exist in the source	NULL

3.1.2 Table: Enrollment

The ENROLLMENT table has a start/stop structure that contains records for continuous enrollment periods.

"Enrollment" is an insurance-based concept that defines a period during which all medically-attended events are expected to be observed. For partners that do not have enrollment information for some of their patients, other approaches for identifying periods during which complete medical capture is expected can be used.

This table is designed to identify periods during which a person is expected to have complete data capture. Members with medical coverage, drug coverage, or both should be included.

A record is expected to represent a unique combination of PATID, ENR_START_DATE.

Currently OMOP CDM is using the earliest and latest encounter dates ('E'), which is in violation of the PCORnet requirement. This is to be discussed with PCORnet.

Enrollment field mapping:

<table>
<tr><th>Destination Field</th><th>Source Field</th><th>Applied Rule</th><th>Comment</th></tr>
<tr><td>PATID</td><td>Observation_Period.person_id</td><td></td><td>Convert to text</td></tr>
<tr><td>ENR_START_DATE</td><td>Observation_Period.observation_period_start_date</td><td></td><td></td></tr>
<tr><td>ENR_END_DATE</td><td>Observation_Period.observation_period_end_date</td><td></td><td></td></tr>
<tr><td>CHART</td><td>Observation.value_as_concept_id where observation_type_concept_id = 4030450 (Patient chart)</td><td>Join to Observation table on person_id, observation_start_date and observation_type_concept_id = 4030450 (Patient chart). If the value_as_concept_id = 4188539 (Yes) then ‘Y’ else ‘N’</td><td>The absence of an Observation record for a person for an Observation Period will be interpreted as No.</td></tr>
<tr><td>ENR_BASIS</td><td>Observation_Period.period_type_concept_id</td><td>
<table>
<tr><th colspan="2">OMOP to PCORnet</th></tr>
<tr><td>44814722</td><td>I = Insurance</td></tr>
<tr><td>44814723</td><td>G = Geography</td></tr>
<tr><td>44814725</td><td>A = Algorithmic</td></tr>
<tr><td>44814724</td><td>E = Encounter Based</td></tr>
</table>
</td><td>
<table>
<tr><th colspan="2">OMOP Concepts</th></tr>
<tr><td>44814722</td><td>Insurance</td></tr>
<tr><td>44814723</td><td>Geography</td></tr>
<tr><td>44814725</td><td>Algorithmic</td></tr>
<tr><td>44814724</td><td>Encounter Based</td></tr>
</table>
</td></tr>
</table>

3.1.3 Table: Encounter

The ENCOUNTER Table contains one record per PATID and ENCOUNTERID (which reflects a unique combination of PATID, ADMIT_DATE, PROVIDERID and ENC_TYPE).
The encounter table should include information on interactions between patients and providers. Each diagnosis and procedure recorded during the encounter should have a separate record in the Diagnosis or Procedure Tables.
Multiple visits to the same provider on the same day may be considered one encounter (especially if defined by a reimbursement basis); if so, the ENCOUNTER record should be associated with all diagnoses and procedures that were recorded during those visits.

Note: PCORnet requires that all Procedure and Diagnosis records link back to an Encounter record. This is not a requirement for OMOP CDM. It may be necessary for the ETL to ‘create’ Encounters for some Procedures and Diagnosis records.

Encounter field mapping:

<table>
<tr><th>Destination Field</th><th>Source Field</th><th>Applied Rule</th><th>Comment</th></tr>
<tr><td>PATID</td><td>Visit_Occurrence.person_id</td><td></td><td>Convert to text, Required</td></tr>
<tr><td>ENCOUNTERID</td><td>Visit_Occurrence.visit_occurrence_id</td><td></td><td>Convert to text, Required</td></tr>
<tr><td>ADMIT_DATE</td><td>Visit_Occurrence.visit_start_date</td><td></td><td>This also will hold the encounter date for encounters that are not ER or Inpatient. Required</td></tr>
<tr><td>ADMIT_TIME</td><td>Visit_Occurrence.visit_start_time</td><td>If available format as ‘hh:mm:ss’ military time otherwise is should be NULL</td><td></td></tr>
<tr><td>DISCHARGE_DATE</td><td>Visit_Occurrence.visit_end_date</td><td></td><td></td></tr>
<tr><td>DISCHARGE_TIME</td><td>Visit_Occurrence.visit_end_time</td><td>If available format as ‘hh:mm:ss’ otherwise is should be NULL</td><td></td></tr>
<tr><td>PROVIDERID</td><td>Visit_Occurrence.provider_id</td><td></td><td>Convert to text</td></tr>
<tr><td>FACILITY_LOCATION</td><td>Location.zip (first 3 digits only)</td><td>Join Visit_Occurrence to Care_Site on care_site_id, then to Location on location_id. NULL if it cannot be derived.</td><td>Only if zipcode is available. Otherwise NULL
3-digit zip for PCORNet</td></tr>
<tr><td>ENC_TYPE</td><td>Visit_Occurrence.visit_concept_id</td><td>
<table>
<tr><th colspan="2">OMOP to PCORnet</th></tr>
<tr><td>9201</td><td>IP = Inpatient Hospital Stay</td></tr>
<tr><td>9202</td><td>AV = Ambulatory Visit</td></tr>
<tr><td>9203</td><td>ED = Emergency Department</td></tr>
<tr><td>TBD</td><td>EI = Emergency Department Inpatient Hospital Stay</td></tr>
<tr><td>42898160</td><td>IS = Non-Acute Institutional Stay</td></tr>
<tr><td>44814710</td><td>IS = Non-Acute Institutional Stay</td></tr>
<tr><td>44814711</td><td>OA = Other Ambulatory Visit</td></tr>
</table>
</td><td>Required
<table>
<tr><th colspan="2">OMOP Concepts</th></tr>
<tr><td>9201</td><td>Inpatient Visit</td></tr>
<tr><td>9202</td><td>Outpatient Visit</td></tr>
<tr><td>9203</td><td>Emergency Room Visit</td></tr>
<tr><td>42898160</td><td>Long Term Care Visit</td></tr>
<tr><td>TBD</td><td>Emergency Room - Inpatient Visit</td></tr>
<tr><td>44814710</td><td>Non-Acute Institutional Stay</td></tr>
<tr><td>44814711</td><td>Other ambulatory visit</td></tr>
<tr><td>44814650</td><td>No information</td></tr>
</table>
</td></tr>
</table>

<table>
<tr>
<td></td>
<td></td>
<td>
<table>
<tr><td>44814650</td><td>NI = No information</td></tr>
<tr><td>44814653</td><td>UN = Unknown</td></tr>
<tr><td>44814649</td><td>OT = Other</td></tr>
<tr><td>0</td><td>NULL</td></tr>
</table>
</td>
<td>
<table>
<tr><td>44814653</td><td>Unknown</td></tr>
<tr><td>44814649</td><td>Other</td></tr>
<tr><td>0</td><td>Field does not exist in the source</td></tr>
</table>
</td>
</tr>
<tr>
<td>FACILITYID</td>
<td>Visit_Occurrence.care_site_id</td>
<td></td>
<td>Convert to text</td>
</tr>
<tr>
<td>DISCHARGE_DISPOSITION</td>
<td>Visit_occurrence .discharge_to_concept_id</td>
<td>OMOP uses a single value, discharge_to_concept_id for both the discharge disposition and status. If the patient discharge concept id is to any of the location listed in the discharge status section, then the assumption is the person was discharged alive. Set to NULL for ambulatory or OA visits.
<table>
<tr><th colspan="2">OMOP to PCORnet</th></tr>
<tr><td>4161979</td><td>A = Discharged alive</td></tr>
<tr><td>4216643</td><td>E = Expired</td></tr>
<tr><td>44814650</td><td>NI = No information</td></tr>
<tr><td>44814653</td><td>UN = Unknown</td></tr>
<tr><td>44814649</td><td>OT = Other</td></tr>
<tr><td>Any other code</td><td>A = Discharged alive</td></tr>
<tr><td>0</td><td>NULL</td></tr>
</table>
</td>
<td>
<table>
<tr><th colspan="2">OMOP Concepts</th></tr>
<tr><td>4161979</td><td>Discharged alive</td></tr>
<tr><td>4216643</td><td>Patient died</td></tr>
<tr><td>44814650</td><td>No Information</td></tr>
<tr><td>44814653</td><td>Unknown</td></tr>
<tr><td>44814649</td><td>Other</td></tr>
<tr><td>0</td><td>Field does not exist in the source</td></tr>
</table>
</td>
</tr>
<tr>
<td>DISCHARGE_STATUS</td>
<td>Visit_occurrence .discharge_to_concept_id</td>
<td>Set to NULL for ambulatory or OA visits.
<table>
<tr><th colspan="2">OMOP to PCORnet</th></tr>
<tr><td>38004205</td><td>AF = Adult Foster Home</td></tr>
<tr><td>38004301</td><td>AL = Assisted Living Facility</td></tr>
<tr><td>4021968</td><td>AM = Against Medical Advice</td></tr>
</table>
</td>
<td>
<table>
<tr><th colspan="2">OMOP Concepts</th></tr>
<tr><td>38004205</td><td>Agencies, Foster Care Agency</td></tr>
<tr><td>38004301</td><td>Nursing & Custodial Care Facilities, Assisted Living Facility</td></tr>
</table>
</td>
</tr>
</table>

<table>
<tr>
<td></td>
<td></td>
<td>
<table>
<tr><td>44814693</td><td>AW = Absent without leave</td></tr>
<tr><td>4216643</td><td>EX = Expired</td></tr>
<tr><td>38004195</td><td>HH = Home Health</td></tr>
<tr><td>8536</td><td>HO = Home / Self Care</td></tr>
<tr><td>8546</td><td>HS = Hospice</td></tr>
<tr><td>38004279</td><td>IP = Other Acute Inpatient Hospital</td></tr>
<tr><td>8676</td><td>NH = Nursing Home (Includes ICF)</td></tr>
<tr><td>8920</td><td>RH = Rehabilitation Facility</td></tr>
<tr><td>44814680</td><td>RS = Residential Facility</td></tr>
<tr><td>8717</td><td>SH = Still In Hospital</td></tr>
<tr><td>8863</td><td>SN = Skilled Nursing Facility</td></tr>
<tr><td>44814650</td><td>NI = No information</td></tr>
<tr><td>44814653</td><td>UN = Unknown</td></tr>
<tr><td>44814649</td><td>OT = Other</td></tr>
<tr><td>0</td><td>NULL</td></tr>
</table>
</td>
<td>
<table>
<tr><td>4021968</td><td>Patient self-discharge against medical advice</td></tr>
<tr><td>44814693</td><td>Absent without leave</td></tr>
<tr><td>4216643</td><td>Patient died</td></tr>
<tr><td>38004195</td><td>Agencies, Home Health</td></tr>
<tr><td>8536</td><td>Home</td></tr>
<tr><td>8546</td><td>Hospice</td></tr>
<tr><td>38004279</td><td>Hospitals, General Acute Care Hospital</td></tr>
<tr><td>8676</td><td>Nursing Facility</td></tr>
<tr><td>8920</td><td>Comprehensive Inpatient Rehabilitation Facility:</td></tr>
<tr><td>44814680</td><td>Residential Facility</td></tr>
<tr><td>8717</td><td>Inpatient Hospital</td></tr>
<tr><td>8863</td><td>Skilled Nursing Facility</td></tr>
<tr><td>44814650</td><td>No information</td></tr>
<tr><td>44814653</td><td>Unknown</td></tr>
<tr><td>44814649</td><td>Other</td></tr>
<tr><td>0</td><td>No matching concept</td></tr>
</table>
</td>
</tr>
<tr>
<td>DRG</td>
<td>Cost.DRG_source_value</td>
<td>Join Cost table on visit_occurrence_id
Set to NULL for ambulatory or OA visits.</td>
<td></td>
</tr>
<tr>
<td>DRG_TYPE</td>
<td>See Applied Rule</td>
<td>OMOP CDMv5 does not have this information. Use the appropriate value from the vocabulary below:
01 = CMS-DRG (old system)</td>
<td>02- double check</td>
</tr>
</table>

<table>
<tr><td></td><td></td><td>02 = MS-DRG (current system)
NI = No information
UN = Unknown
OT = Other</td><td></td></tr>
<tr><td>ADMITTING_SOURCE</td><td>Visit_occurrence
.admitting_source_concept
_id</td><td>Not applicable to ambulatory or OA visits.
<table>
<tr><th colspan="2">OMOP to PCORnet</th></tr>
<tr><td>38004205</td><td>AF = Adult Foster Home</td></tr>
<tr><td>38004195</td><td>HH = Home Health</td></tr>
<tr><td>38004207</td><td>AV = Ambulatory Visit</td></tr>
<tr><td>8920</td><td>RH = Rehabilitation Facility</td></tr>
<tr><td>8870</td><td>ED = Emergency Department</td></tr>
<tr><td>8536</td><td>HO = Home / Self Care</td></tr>
<tr><td>8546</td><td>HS = Hospice</td></tr>
<tr><td>38004279</td><td>IP = Other Acute Inpatient Hospital</td></tr>
<tr><td>38004301</td><td>AL = Assisted Living Facility</td></tr>
<tr><td>8676</td><td>NH = Nursing Home (Includes ICF)</td></tr>
<tr><td>44814680</td><td>RS = Residential Facility</td></tr>
<tr><td>8863</td><td>SN = Skilled Nursing Facility</td></tr>
<tr><td>44814650</td><td>NI = No information</td></tr>
<tr><td>44814653</td><td>UN = Unknown</td></tr>
<tr><td>44814649</td><td>OT = Other</td></tr>
<tr><td>0</td><td>NULL</td></tr>
</table></td><td>
<table>
<tr><th colspan="2">OMOP Concepts</th></tr>
<tr><td>38004205</td><td>Agencies, Foster Care Agency</td></tr>
<tr><td>38004195</td><td>Agencies, Home Health</td></tr>
<tr><td>38004207</td><td>Ambulatory Health Care Facilities, Clinic/Center, Ambulatory Surgical</td></tr>
<tr><td>8920</td><td>Comprehensive Inpatient Rehabilitation Facility</td></tr>
<tr><td>8870</td><td>Emergency Room - Hospital</td></tr>
<tr><td>8536</td><td>Home</td></tr>
<tr><td>8546</td><td>Hospice</td></tr>
<tr><td>38004279</td><td>Hospitals, General Acute Care Hospital</td></tr>
<tr><td>38004301</td><td>Nursing & Custodial Care Facilities, Assisted Living Facility</td></tr>
<tr><td>8676</td><td>Nursing Facility</td></tr>
<tr><td>44814680</td><td>Residential facility</td></tr>
<tr><td>8863</td><td>Skilled Nursing Facility</td></tr>
<tr><td>44814650</td><td>No Information</td></tr>
<tr><td>44814653</td><td>Unknown</td></tr>
<tr><td>44814649</td><td>Other</td></tr>
<tr><td>0</td><td>Field does not exist in the source</td></tr>
</table></td></tr>
</table>

RAW_ ENC_TYPE	Visit_Occurrence.visit_source_value		
RAW_ DISCHARGE_DISPOSITION	Visit_occurrence .discharge_to_source_value	Not applicable to ambulatory or OA visits.	Note: discharge_to_source_value is used to populate both discharge disposition and discharge status
RAW_ DISCHARGE_STATUS	Visit_occurrence .discharge_to_source_value	Not applicable to ambulatory or OA visits.	
RAW_ DRG_TYPE	NULL	Not applicable to ambulatory or OA visits.	
RAW_ ADMITTING_SOURCE	Visit_occurrence .admitting_source_value	Not applicable to ambulatory or OA visits.	

3.1.4 Table: Diagnosis

DIAGNOSIS should capture unique diagnoses made during an encounters, except those generated from problem lists. If a patient has multiple diagnoses associated with one encounter, then there should be one record in this table for each diagnosis. Exclude records from the OMOP CDM where the Condition Type Concept is EHR problem list entry (38000245). Records where the Condition Type Concept is EHR problem list entry will go into the PCORnet Condition table.

The admit date for the diagnosis is copied from the encounter record which is the admission or appointment date, whereas in the OMOP CDM, the condition occurrence date is when the condition was defined. Therefore, it is possible that there will be more than one of the same diagnoses during a visit in the OMOP CDM. Duplicate records are also possible due to the mapping of one source code to multiple standard codes.

Duplicate diagnosis records should be reduced to a single record for PCORnet based on the following Condition Occurrence attributes: *person_id, visit occurrence id* and *condition source value*. Some of the columns in the duplicated records may have different values, for example, the *condition status source value* might be 'Admitting' for one record and 'Final' for another. The desire is to select the most definitive record. So in deduping, order the records by the *condition status source values*: Final/Discharge, Admitting, Interim, No Information, Unknown, Other, NULL, and then by the *condition type*: Principal, Secondary, Unable to Classify, No Information, Unknown, Other, NULL. Take the values from the first row.

Diagnosis field mapping:

Destination Field	Source Field	Applied Rule	Comment

<table>
<tr><td>DIAGNOSISID</td><td>Condition_Occurrence
.condition_occurence_id</td><td></td><td>Convert to text
Arbitrary id, per PCORNet does not need to be persistent across refreshes.
Required</td></tr>
<tr><td>PATID</td><td>Condition_Occurrence.person_id</td><td></td><td>Convert to text. Required</td></tr>
<tr><td>ENCOUNTERID</td><td>Condition_Occurrence
.visit_occurrence_id</td><td></td><td>Convert to text. Required</td></tr>
<tr><td>ENC_TYPE</td><td>Encounter.enc_type</td><td>Join to [target] Encounter table on
Encounter.encounterid =
Condition_Occurrence.visit_occurrence_id</td><td>Copied from ENCOUNTER record.
Required</td></tr>
<tr><td>ADMIT_DATE</td><td>Encounter.admit_date</td><td>Join to Encounter table on
Encounter.encounterid =
Condition_Occurrence.visit_occurrence_id</td><td>Copied from ENCOUNTER record.
Required</td></tr>
<tr><td>PROVIDERID</td><td>Encounter.provider_id</td><td>Join to encounter table on
Encounter.encounterid =
Condition_Occurrence.visit_occurrence_id</td><td>Convert to text
Copied from ENCOUNTER record</td></tr>
<tr><td>DX</td><td>Condition_Occurrence
.condition_source_value</td><td></td><td>PCORnet expects to see diagnosis codes as they were represented in the source system. Required</td></tr>
<tr><td>DX_TYPE</td><td>Derive from Concept
.vocabulary_id</td><td>Join condition_source_concept_id to Concept.concept_id to get vocabulary_id
<table><tr><th colspan="2">OMOP to PCORnet Vocabulary Mapping</th></tr><tr><td>ICD9CM</td><td>09 = ICD-9-CM</td></tr><tr><td>ICD10CM</td><td>10 = ICD-10-CM</td></tr><tr><td>SNOMED</td><td>SM = SNOMED CT</td></tr></table>
Otherwise
use ‘OT’ (‘Other’)</td><td>If a local ontology is used, and cannot be mapped to a standard ontology such as ICD-9-CM, DX_TYPE should be populated as “Other”.
Required.</td></tr>
<tr><td>DX_SOURCE</td><td>Condition_Occurrence
.condition_status_concept_id</td><td><table><tr><th colspan="2">OMOP to PCORnet</th></tr><tr><td>4203942</td><td>AD = Admitting</td></tr><tr><td>4230359</td><td>FI = Final/Discharge</td></tr><tr><td>4033240</td><td>IN = Interim</td></tr><tr><td>44814650</td><td>No Information</td></tr><tr><td>44814653</td><td>Unknown</td></tr><tr><td>44814649</td><td>Other</td></tr></table></td><td>Required
<table><tr><th colspan="2">OMOP Concepts</th></tr><tr><td>4203942</td><td>Admitting diagnosis</td></tr><tr><td>4230359</td><td>Final /discharge diagnosis</td></tr><tr><td>4033240</td><td>Preliminary diagnosis</td></tr></table></td></tr>
</table>

<table>
<tr><td></td><td></td><td></td><td><table><tr><td>44814650</td><td>No Information</td></tr><tr><td>0</td><td>Unknown</td></tr><tr><td>44814649</td><td>Other</td></tr></table></td></tr>
<tr><td>PDX</td><td>Derive from Condition_Occurrence .condition_type_concept_id</td><td>If condition_type_concept_id = 44786627
Then 'P' (Principal)
Else If condition_type_concept_id = 44786629
Then 'S' (Secondary)
Else
If respective Visit_Occurrence.visit_concept_id are
9202 (Outpatient Visit)
9203 (Emergency Room Visit)
44814711 (Other ambulatory visit)
Then ‘X’ (Unable to Classify)
Else<table><tr><td colspan="2">OMOP to PCORnet</td></tr><tr><td>44814650</td><td>No Information</td></tr><tr><td>44814653</td><td>Unknown</td></tr><tr><td>44814649</td><td>Other</td></tr></table></td><td>Principal discharge diagnosis flag. Relevant only
on IP and IS encounters.

Primary Condition (44786627)
and Secondary Condition(44786629)</td></tr>
<tr><td>RAW_DX</td><td>Condition_Occurrence .condition_source_value</td><td></td><td>Load source values 'as is' - with source-specific suffixes and prefixes.</td></tr>
<tr><td>RAW_ DX_TYPE</td><td>Concept.vocabulary_id</td><td>Same as dx_type above</td><td></td></tr>
<tr><td>RAW_ DX_SOURCE</td><td>Condition status source value</td><td>If de-dupping, should match the dx_source</td><td></td></tr>
<tr><td>RAW_ PDX</td><td>Concept.concept_name</td><td>If condition_type_concept_id IN(44786627, 44786629) join to Concept.concept_id
Otherwise NULL</td><td>Primary Condition (44786627)
Secondary Condition (44786629)</td></tr>
</table>

3.1.5 Table: Procedure

The PROCEDURE Table contains one record per unique combination of PATID, ENCOUNTERID, PX, and PX_TYPE. Because the date in the procedure table is that of the encounter, not necessarily when the procedure was performed, there may be multiples of the same procedure for the person/encounter/date when selecting from the OMOP procedure table. Duplicate records are also possible due to the mapping

of one source code to multiple standard codes. These duplicated procedure records should be reduced to a single record in PCORnet based on procedure_occurrence.visit_occurrence_id and procedure_occurrence.procedure_source_value.
In OMOP CDM Procedure_Occurrence.visit_occurrence_id is optional, however PCORNet CDM specification requires mandatory encounter id for DIAGNOSIS and PROCEDURE. Exclude procedures where the visit_occurrence_id is NULL.
Procedure field mapping:

<table>
<tr><th>Destination Field</th><th>Source Field</th><th>Applied Rule</th><th>Comment</th></tr>
<tr><td>PROCEDURESID</td><td></td><td></td><td>Required</td></tr>
<tr><td>PATID</td><td>Procedure_Occurrence.person_id</td><td></td><td>Convert to text. Requred</td></tr>
<tr><td>ENCOUNTERID</td><td>Procedure_Occurrence.visit_occurrence_id</td><td></td><td>Convert to text. Required</td></tr>
<tr><td>ENC_TYPE</td><td>Encounter.enc_type</td><td>Join to [target] Encounter table on Procedure_Occurrence.visit_occurrence_id = Encounter.encounterid</td><td>Copied from ENCOUNTER record. Required</td></tr>
<tr><td>ADMIT_DATE</td><td>Encounter.admit_date</td><td>Join to Encounter table on Procedure_Occurrence.visit_occurrence_id = Encounter.encounterid</td><td>Copied from ENCOUNTER record. Required</td></tr>
<tr><td>PROVIDERID</td><td>Encounter.provider_id</td><td>Join to encounter table on Procedure_Occurrence.visit_occurrence_id = Encounter.providerid</td><td>Convert to text
Copied from ENCOUNTER record.</td></tr>
<tr><td>PX_DATE</td><td>procedure_occurrence.procedure_date</td><td></td><td></td></tr>
<tr><td>PX</td><td>procedure_occurrence.procedure_source_value
Otherwise
Concept.concept_code</td><td>If procedure_source_concept_id is 44814649 (Other) or 0 (No matching concept), use procedure_occurrence.procedure_source_value.
Otherwise
join procedure_ source_concept_id to Concept.concept_id.</td><td>PCORnet expects to see all procedure codes as they were represented in the source system. Therefore, use source_concept_id or source_value to represent PX in the source coding system.
Required</td></tr>
<tr><td>PX_TYPE</td><td>Derive from Concept.vocabulary_id</td><td>Join procedure_source_concept_id to Concept.concept_id to get vocabulary_id
<table>
<tr><th colspan="2">OMOP to PCORnet Vocabulary Mapping</th></tr>
<tr><td>ICD9CM</td><td>09 = ICD-9-CM</td></tr>
<tr><td>ICD9Proc</td><td>09 = ICD-9-CM</td></tr>
<tr><td>ICD10PCS</td><td>10 = ICD-10-PCS</td></tr>
</table></td><td>Required
<table>
<tr><th>OMOP Vocabulary Codes</th></tr>
<tr><td>ICD9CM</td></tr>
<tr><td>ICD9Proc</td></tr>
<tr><td>ICD10PCS</td></tr>
<tr><td>CPT4</td></tr>
</table></td></tr>
</table>

<table>
<tr>
<td></td>
<td></td>
<td>
<table>
<tr><td>CPT4</td><td>C4 = CPT-4 (i.e., HCPCS Level I)</td></tr>
<tr><td>HCPCS</td><td>HC = HCPCS (i.e., HCPCS Level II)</td></tr>
<tr><td>LOINC</td><td>LC = LOINC</td></tr>
<tr><td>NDC</td><td>ND = NDC</td></tr>
<tr><td>Revenue Code</td><td>RE = Revenue</td></tr>
<tr><td>PCORNet</td><td>OT = Other</td></tr>
</table>
Otherwise
Use ‘OT’ (‘Other’).
</td>
<td>
<table>
<tr><td>HCPCS</td></tr>
<tr><td>LOINC</td></tr>
<tr><td>NDC</td></tr>
<tr><td>Revenue Code</td></tr>
<tr><td>PCORNet</td></tr>
</table>
</td>
</tr>
<tr>
<td>PX_SOURCE</td>
<td>procedure_occurrence.procedure_type_concept_id</td>
<td>If the procedure type is:
any of the claims values set to CL
EHR Order List, set to OD
Hospital Cost Record, set to BI
Otherwise set to OT</td>
<td>PCORnet values are
OD=Order
BI=Billing
CL=Claim
NI=No information
UN=Unknown
OT=Other</td>
</tr>
<tr>
<td>RAW_PX</td>
<td>Procedure_Occurrence.procedure_source_value</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RAW_PX_TYPE</td>
<td>Concept.concept_id</td>
<td>If source_condition_concept_id is 44814649 (Other) or 0 (No matching concept), use ‘OT’ (‘Other’).
Otherwise, join procedure_source_concept_id to Concept.concept_id</td>
<td></td>
</tr>
</table>

3.1.6 Table: Vital

Measurements to Vital

Multiple measurements per encounter can be populated (for example, 3 blood pressure readings). There will be records where not all the vital statistics are defined. Create a record any time there is at least one of the attributes, weight, blood pressure, height or BMI is defined.
Vital signs data are sourced from OMOP Measurement and Observation tables.
Records corresponding to one visit may be grouped into one Vital record or represented as one Vital record per one vital sign.
Systolic and diastolic blood pressure coming from the same measurement must be by grouped into one record by utilizing Fact_Relationship link between the two records in the Measurement table as follows. Fact_id_1 and fact_id_2 should be equal to the respective measurement_id of diastolic and systolic BP records. Domain_concept_id_1 and domain_concept_id_2 should be equal to 21 (‘Measurement’).

Relationship_concept_id should be equal to 46233682 (‘Diastolic to systolic blood pressure measurement’).

OMOP Measurement to PCORnet VITAL field mapping:

<table>
<tr><th>Destination Field</th><th>Source Field</th><th>Applied Rule</th><th>Comment</th></tr>
<tr><td>VITALID</td><td></td><td></td><td>Required</td></tr>
<tr><td>PATID</td><td>Measurement.person_id</td><td></td><td>Convert to text. Required</td></tr>
<tr><td>ENCOUNTERID</td><td>Measurement.visit_occurrence_id
or
NULL</td><td></td><td>Convert to text
Arbitrary encounter-level identifier. This is an optional relationship; the ENCOUNTERID should be present if the vitals were measured as part of healthcare delivery: Measurement.measurement_type_concept_id = ‘Observation Recorded from EHR’ (38000276).</td></tr>
<tr><td>MEASURE_DATE</td><td>Measurement.
measurement_date</td><td></td><td>Required</td></tr>
<tr><td>MEASURE_TIME</td><td>Measurement.measurement_time</td><td>Text. Format as 'HH:MI' as 24 hours clock with zero-padding for hours and minutes.</td><td></td></tr>
<tr><td>VITAL_SOURCE</td><td>Measurement.
measurement_type_concept_id</td><td>
<table>
<tr><th colspan="2">OMOP to PCORnet</th></tr>
<tr><th>Concept Id</th><th>PCORnet Value</th></tr>
<tr><td>45754907</td><td>OT = Other</td></tr>
<tr><td>44818701</td><td>HC = Healthcare delivery setting</td></tr>
<tr><td>44818702</td><td>HC = Healthcare delivery setting</td></tr>
<tr><td>44818703</td><td>HC = Healthcare delivery setting</td></tr>
<tr><td>44818704</td><td>PR=Patient-reported</td></tr>
<tr><td>5001</td><td>HC = Healthcare delivery setting</td></tr>
<tr><td>0</td><td>OT = Other</td></tr>
</table>
</td><td>
<table>
<tr><th>Concept</th><th>Description</th></tr>
<tr><td>45754907</td><td>Derived value</td></tr>
<tr><td>44818701</td><td>From physical examination</td></tr>
<tr><td>44818702</td><td>Lab result</td></tr>
<tr><td>44818703</td><td>Pathology finding</td></tr>
<tr><td>44818704</td><td>Patient reported value</td></tr>
<tr><td>5001</td><td>Test ordered through EHR</td></tr>
</table>
If multiple vital signs are compiled together in one record, Measurement.measurement_Type_Concept_ID must be the same. Required</td></tr>
<tr><td>HT</td><td>Measurement.value_as_number</td><td>Where Measurement .measurement_concept_id = 3036277 (Body height)
Convert to inches.</td><td></td></tr>
</table>

<table>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td>WT</td><td>Measurement.value_as_number</td><td>Where Measurement .measurement_concept_id = 3025315 (Body weight)
Convert to pounds</td><td></td></tr>
<tr><td>DIASTOLIC</td><td>Measurement.value_as_number</td><td>Where Measurement .measurement_concept_id in (3012888, 3034703, 3019962, 3013940)</td><td></td></tr>
<tr><td>SYSTOLIC</td><td>Measurement.value_as_number</td><td>Where Measurement .measurement_concept_id in (3004249, 3018586, 3035856, 3009395)</td><td></td></tr>
<tr><td>ORIGINAL_BMI</td><td>Measurement.value_as_number</td><td>Where Measurement .measurement_concept_id = 3038553 (Body mass index)</td><td></td></tr>
<tr><td>BP_POSITION</td><td>derived from Measurement.measurement_concept_id</td><td><table><tr><th>Concept</th><th>Description</th><th>PCORnet Value</th></tr><tr><td>3034703</td><td>Diastolic Blood Pressure - Sitting</td><td>‘01’</td></tr><tr><td>3019962</td><td>Diastolic Blood Pressure - Standing</td><td>‘02’</td></tr><tr><td>3013940</td><td>Diastolic Blood Pressure - Supine</td><td>‘03’</td></tr><tr><td>3012888</td><td>Diastolic BP</td><td>‘NI’</td></tr><tr><td>3018586</td><td>Systolic Blood Pressure - Sitting</td><td>‘01’</td></tr><tr><td>3035856</td><td>Systolic Blood Pressure - Standing</td><td>‘02’</td></tr><tr><td>3009395</td><td>Systolic Blood Pressure - Supine</td><td>‘03’</td></tr><tr><td>3004249</td><td>Systolic BP</td><td>‘NI’</td></tr></table>NULL if no blood pressure reading in this record.</td><td>Position when blood pressure taken is derived from the diastolic and systolic code provided.</td></tr>
<tr><td>RAW_DIASTOLIC</td><td>Measurement.measurement_source_value</td><td>Where Measurement .measurement_concept_id in (3012888, 3034703, 3019962, 3013940)</td><td><table><tr><th colspan="2">OMOP Concepts</th></tr><tr><td>3012888</td><td>BP diastolic</td></tr><tr><td>3034703</td><td>Diastolic blood pressure--sitting</td></tr></table></td></tr>
</table>

			3019962 Diastolic blood pressure--standing 3013940 Diastolic blood pressure--supine
RAW_ SYSTOLIC	Measurement.measurement_source_value	Measurement .measurement_concept_id in (3004249, 3018586, 3035856, 3009395)	OMOP Concepts 3004249 BP systolic 3018586 Systolic blood pressure--sitting 3035856 Systolic blood pressure--standing 3009395 Systolic blood pressure--supine
RAW _ BP_ POSITION	NULL		Not available

Tobacco to Vital

Tobacco status and tobacco type Observation records are grouped into one VITAL record by *person_id* and *visit_occurrence_id* or *obsevation_date* where the *Observation.observation_concept_id* is set to 4041306 (Tobacco use and exposure). A scheme to convert these records into the PCORNET values for *smoking, tobacco* and *tobacco_type* is explained in the document 'A Solution for Mapping OMOP Observation to PCORnet Vital Smoking'. This will allow the ETL to consolidate the various possible tobacco related responses into a single set of values for PCORnet.

OMOP Observation to PCORnet VITAL field mapping for Tobacco:

Destination Field	Source Field	Applied Rule	Comment
VITALID			
PATID	Observation.person_id		Convert to text
ENCOUNTERID	Observation.visit_occurrence_id or NULL		Convert to text Arbitrary encounter-level identifier. This is an optional relationship; the ENCOUNTERID should be present if the vitals were measured as part of healthcare

<table>
<tr><td></td><td></td><td></td><td>delivery: Observation.Observation_type_concept_id = ‘Observation Recorded from EHR’ (38000276).</td></tr>
<tr><td>MEASURE_DATE</td><td>Observation. Observation_date</td><td></td><td></td></tr>
<tr><td>MEASURE_TIME</td><td>Observation.Observation_time</td><td>Text. Format as 'HH:MI' as 24 hours clock with zero-padding for hours and minutes.</td><td></td></tr>
<tr><td>VITAL_SOURCE</td><td>Observation. Observation_type_concept_id</td><td><table><tr><th colspan="2">OMOP to PCORnet</th></tr><tr><td>44814721</td><td>PR = Patient-reported</td></tr><tr><td>38000276</td><td>HC = Healthcare delivery setting</td></tr><tr><td>All other codes</td><td>OT = Other</td></tr></table></td><td>Relevant OMOP concepts are: ‘Patient reported’ (44814721) or ‘Observation Recorded from EHR’ (38000276). If multiple vital signs are compiled together in one record, Observation.Observation_Type_Concept_ID must be the same.</td></tr>
<tr><td>SMOKING</td><td>Observation.value_as_concept_id</td><td>Where Observation.observation_concept_id = 4041306 (Tobacco use and exposure)<table><tr><th colspan="2">Valid PCORnet values</th></tr><tr><td>01</td><td>Current every day smoker</td></tr><tr><td>02</td><td>Current some day smoker</td></tr><tr><td>03</td><td>Former smoker</td></tr><tr><td>04</td><td>Never smoker</td></tr><tr><td>05</td><td>Smoker, current status unknown</td></tr><tr><td>06</td><td>Unknown if ever smoked</td></tr><tr><td>07</td><td>Heavy tobacco smoker</td></tr><tr><td>08</td><td>Light tobacco smoker</td></tr><tr><td>NI</td><td>No information</td></tr><tr><td>UN</td><td>Unknown</td></tr><tr><td>OT</td><td>Other</td></tr></table></td><td>See ‘A Solution for Mapping OMOP Observation to PCORnet Vital Smoking’</td></tr>
</table>

<table>
<tr>
<td>TOBACCO</td>
<td>Observation.value_as_concept_id</td>
<td>Where Observation.observation_concept_id = 4041306 (Tobacco use and exposure)
<table>
<tr><th colspan="2">Valid PCORnet values</th></tr>
<tr><td>01</td><td>Current user</td></tr>
<tr><td>02</td><td>Never</td></tr>
<tr><td>03</td><td>Quit/former user</td></tr>
<tr><td>04</td><td>Passive or environmental exposure</td></tr>
<tr><td>06</td><td>Not asked</td></tr>
<tr><td>NI</td><td>No information</td></tr>
<tr><td>UN</td><td>Unknown</td></tr>
<tr><td>OT</td><td>Other</td></tr>
</table>
</td>
<td>See ‘A Solution for Mapping OMOP Observation to PCORnet Vital Smoking’</td>
</tr>
<tr>
<td>TOBACCO_TYPE</td>
<td>Observation.value_as_concept_id</td>
<td>Where Observation.observation_concept_id = 4041306 (Tobacco use and exposure)
<table>
<tr><th colspan="2">Valid PCORnet values</th></tr>
<tr><td>01</td><td>01 = Cigarettes only</td></tr>
<tr><td>02</td><td>Non-smoked tobacco only</td></tr>
<tr><td>03</td><td>Cigarettes and other tobacco</td></tr>
<tr><td>04</td><td>None</td></tr>
<tr><td>05</td><td>Use of smoked tobacco but no information about non-smoked tobacco use</td></tr>
<tr><td>NI</td><td>No information</td></tr>
<tr><td>UN</td><td>Unknown</td></tr>
<tr><td>OT</td><td>Other</td></tr>
</table>
</td>
<td>See ‘A Solution for Mapping OMOP Observation to PCORnet Vital Smoking’</td>
</tr>
<tr>
<td>RAW_SMOKING</td>
<td></td>
<td>Set to NULL</td>
<td></td>
</tr>
<tr>
<td>RAW_TOBACCO</td>
<td></td>
<td>Set to NULL</td>
<td></td>
</tr>
</table>

RAW_TOBACCO_TYPE		Set to NULL	

3.1.7 Table: LAB_RESULT_CM

The LAB_RESULT_CM table contains one record per LAB_RESULT_CM_ID.
Only records with actual lab results should be included in this table. If the results suggest that the test was run (e.g., result is “borderline”) include it. But if the test is not resulted for any reason then do not include it.
The source for Lab results in OMOP CDM is the Measurement table, all measurement records where Measurement.measurement_type_concept_id is 44818702 (‘Lab result’). In OMOP CDM, lab tests are represented by LOINC codes. The following LAB_RESULT_CM fields are derived from the LOINC codes: LAB_NAME, LAB_LOINC, SPECIMEN_SOURCE, and RESULT_UNIT. Mappings for selected LOINC codes between OMOP concepts and these attributes are presented in the table below. This list will have to be expanded as the list of target LOINC codes grows.

PCORnet Lab Name	**OMOP Concept ID**	**LAB_NAME**	**LAB_LOINC**	**SPECIMEN_SOURCE**	**RESULT_UNIT**
Troponin I cardiac	3021337	TROP_I	10839-9	SR_PLS	NG/ML
Creatinine kinase MB/creatinine kinase total	3007150	CK-MBI	12187-1	SR_PLS	PERCENT
Creatinine	3016662	CREATININE	12190-5	OT	MG/DL
Low-density lipoprotein	3028288	LDL	13457-7	SR_PLS	
Creatinine kinase MB	3005785	CK_MB	13969-1	SR_PLS	NG/ML
Low-density lipoprotein	3009966	LDL	18262-6	SR_PLS	MG/DL
Creatinine kinase MB/creatinine kinase total	3016311	CK-MBI	20569-0	SR_PLS	PERCENT
Low-density lipoprotein	3028437	LDL	2089-1	SR_PLS	MG/DL
Creatinine kinase total	3007220	CK	2157-6	SR_PLS	U/L

Creatinine	3016723	CREATININE	2160-0	SR_PLS	MG/DL
Low-density lipoprotein	3001308	LDL	22748-8	SR_PLS	
Creatinine kinase MB	3029790	CK_MB	32673-6	SR_PLS	U/L
Troponin T cardiac (qualitative)	3042837	Trop_T_QL	33204-9	SR_PLS	
Creatinine	3051825	CREATININE	38483-4	BLOOD	MG/DL
Troponin I cardiac	3033745	TROP_I	42757-5	BLOOD	NG/ML
Low-density lipoprotein	3046549	LDL	43727-7	SR_PLS	OT
Hemoglobin A1c	3004410	A1C	4548-4	BLOOD	PERCENT
Low-density lipoprotein	3053190	LDL	47213-4	SR_PLS	
Troponin T cardiac (qualitative)	3048529	Trop_T.QN	48425-3	BLOOD	UG/L
Troponin T cardiac (qualitative)	3052931	Trop_T_QL	48426-1	BLOOD	
Creatinine kinase MB/creatinine kinase total	3048863	CK-MBI	49136-5	SR_PLS	
Low-density lipoprotein	40757565	LDL	54434-6	SR_PLS	OT
Low-density lipoprotein	40758569	LDL	55440-2	SR_PLS	MG/DL
Creatinine kinase MB	3017761	CK_MB	5912-1	SR_PLS	

International normalized ratio	3022217	INR	6301-6	PPP	
Troponin T cardiac (qualitative)	3019572	Trop_T.QN	6597-9	BLOOD	UG/L
Troponin T cardiac (qualitative)	3019800	Trop_T.QN	6598-7	SR_PLS	UG/L
Hemoglobin	3000963	HGB	718-7	BLOOD	G/DL

Lab Result CM field Mapping: (assumes that non-OMOP-standard columns added for Order date and Result date/time)

Destination Field	Source Field	Applied Rule	Comment
LAB_RESULT_CM_ID	Measurement.measurement _id		Convert to text
PATID	Measurement.person_id		Convert to text
ENCOUNTERID	Measurement.visit_occurrence_id or NULL		Convert to text Arbitrary encounter-level identifier. This is an optional relationship; the ENCOUNTERID should be present if the labs were taken as part of healthcare delivery
LAB_NAME	Measurement.measurement_concept_id	Derived from Measurement. measurement_concept_id., see the mapping table above.	
SPECIMEN_SOURCE	Measurement.measurement_concept_id	Derived from Measurement. measurement_concept_id., see the mapping table above.	
LAB_LOINC	Measurement.measurement_concept_id	Derived from Measurement. measurement_concept_id., see the mapping table above.	
PRIORITY	measurement.priority		Optional column added to OMOP Measurement table
RESULT_LOC	NULL		Not populated
LAB_PX	NULL		Not populated
LAB_PX_TYPE	NULL		Not populated

<table>
<tr><td>LAB_ORDER_DATE</td><td>measurement.lab_order_date</td><td></td><td>Optional column added to OMOP Measurement table</td></tr>
<tr><td>SPECIMEN_DATE</td><td>Measurement.measurement_date</td><td></td><td></td></tr>
<tr><td>SPECIMEN_TIME</td><td>Measurement.measurement_time</td><td>Text. Format as 'HH:MI' as 24 hours clock with zero-padding for hours and minutes.</td><td></td></tr>
<tr><td>RESULT_DATE</td><td>Measurement.result_date</td><td></td><td>Optional column added to OMOP Measurement table</td></tr>
<tr><td>RESULT_TIME</td><td>Measurement.result time</td><td>Text. Format as 'HH:MI' as 24 hours clock with zero-padding for hours and minutes.</td><td>Optional column added to OMOP Measurement table</td></tr>
<tr><td>RESULT_QUAL</td><td>Measurement.value_as_concept_id</td><td></td><td>Not populated for the PCORnet required labs but may be populated for other labs.</td></tr>
<tr><td>RESULT_NUM</td><td>Measurement.value_as_number</td><td></td><td></td></tr>
<tr><td>RESULT_MODIFIER</td><td>Concept.concept_code</td><td>Derived by linking Measurement.measurement_source_concept_id to Concept.concept_ id.
<table>
<tr><th colspan="2">OMOP to PCORnet</th></tr>
<tr><td>4171756</td><td>LT = Less than</td></tr>
<tr><td>4171754</td><td>LE = Less than or equal to</td></tr>
<tr><td>4172703</td><td>EQ = Equal</td></tr>
<tr><td>4172704</td><td>GT = Greater than</td></tr>
<tr><td>4171755</td><td>GE = Greater than or equal to</td></tr>
</table></td><td>
<table>
<tr><th colspan="2">OMOP Concepts for Operators</th></tr>
<tr><th>Concept ID</th><th>Concept Name</th></tr>
<tr><td>4171756</td><td><</td></tr>
<tr><td>4171754</td><td><=</td></tr>
<tr><td>4172703</td><td>=</td></tr>
<tr><td>4172704</td><td>></td></tr>
<tr><td>4171755</td><td>>=</td></tr>
</table></td></tr>
<tr><td>RESULT_UNIT</td><td>Measurement.measurement_concept_id</td><td>Derived from Measurement. measurement_concept_id., see the mapping table above.</td><td></td></tr>
<tr><td>NORM_RANGE_LOW</td><td>measurement.range_low</td><td></td><td></td></tr>
<tr><td>NORM_MODIFIER_LOW</td><td>NULL</td><td></td><td>Not populated</td></tr>
<tr><td>NORM_RANGE_HIGH</td><td>measurement.range_high</td><td></td><td></td></tr>
</table>

<table>
<tr><td>NORM_MODIFIER_HIGH</td><td>NULL</td><td></td><td>Not populated</td></tr>
<tr><td>ABN_IND</td><td>measurement.value_as_concept_id</td><td>If the value as concept id is populated with values that indicate low, high or abnormal the map these to PCORnet values
<table><tr><th>Concept Id</th><th>PCORnet Value</th></tr><tr><td>4135493</td><td>AB=Abnormal</td></tr><tr><td>4267416</td><td>AL=Abnormally low</td></tr><tr><td>4328749</td><td>AH=Abnormally high</td></tr><tr><td>4069590</td><td>NL=Normal</td></tr></table>
If the value is NULL in OMOP set to NULL IN PCORnet
Otherwise set to OT = Other</td><td><table><tr><th>Concept</th><th>Descr</th></tr><tr><td>4135493</td><td>Abnormal</td></tr><tr><td>4267416</td><td>Low</td></tr><tr><td>4328749</td><td>High</td></tr><tr><td>4069590</td><td>Normal</td></tr></table></td></tr>
<tr><td>RAW_ LAB_NAME</td><td>Measurement.measurement_source_value</td><td></td><td></td></tr>
<tr><td>RAW_ LAB_CODE</td><td>Concept.concept_code</td><td>Derived by linking Measurement.measurement_source_concept_id to Concept.concept_id</td><td></td></tr>
<tr><td>RAW_ PANEL</td><td>NULL</td><td></td><td>Not populated</td></tr>
<tr><td>RAW_ RESULT</td><td>Measurement.value_source_value</td><td></td><td></td></tr>
<tr><td>RAW_ UNIT</td><td>Measurement.unit_source_value</td><td></td><td></td></tr>
<tr><td>RAW_ ORDER_DEPT</td><td>NULL</td><td></td><td></td></tr>
<tr><td>RAW_ FACILITY_CODE</td><td>NULL</td><td></td><td></td></tr>
</table>

3.1.8 Table: CONDITION

A condition represents a patient's diagnosed and self-reported health conditions and diseases. The patient's medical history and current state may both be represented.
CONDITION should capture all records from the OMOP CDM where the Condition Type Concept is EHR problem list entry (38000245) or Patient Self-Reported Condition (45905770).
Exclude CONDITION row is the *condition_source_value* is a test description rather than a coding vocabulary value.
Condition field mapping:

Destination Field	Source Field	Applied Rule	Comment

<table>
<tr><td>CONDITIONID</td><td></td><td></td><td></td></tr>
<tr><td>PATID</td><td>Condition_Occurrence.person_id</td><td></td><td>Convert to text</td></tr>
<tr><td>ENCOUNTERID</td><td>Condition_Occurrence.visit_occurrence_id</td><td></td><td>Convert to text</td></tr>
<tr><td>REPORT_DATE</td><td>Encounter.admit_date</td><td>Join to [target] Encounter table on Condition_Occurrence.visit_occurrence_id = Encounter.encounterid</td><td>Copied from ENCOUNTER record</td></tr>
<tr><td>RESOLVE_DATE</td><td>condition_occurrence.condition_end_date</td><td></td><td></td></tr>
<tr><td>ONSET_DATE</td><td>condition_occurrence.condition_start_date</td><td></td><td></td></tr>
<tr><td>CONDITION_STATUS</td><td>Derive from condition_end_date</td><td>If condition_end_date is null then
'AC' – Active
Else
'RS' - Resolved</td><td>Condition Status = Inactive will not be populated.</td></tr>
<tr><td>CONDITION</td><td>Condition_Occurrence.condition_source_value</td><td>Exclude rows if the condition source value is a text description rather than a code.</td><td></td></tr>
<tr><td>CONDITION_TYPE</td><td>Derive from Concept.vocabulary_id</td><td>Join source_condition_concept_id to Concept.concept_id to get vocabulary_id
<table><tr><td colspan="2">OMOP to PCORnet Vocabulary Mapping</td></tr><tr><td>ICD9CM</td><td>09 = ICD-9-CM</td></tr><tr><td>ICD10CM</td><td>10 = ICD-10-CM</td></tr><tr><td>SNOMED</td><td>SM = SNOMED CT</td></tr><tr><td>PCORNet</td><td>OT = Other</td></tr></table>
Otherwise
use ‘OT’ (‘Other’)</td><td><table><tr><td>OMOP Vocabularies</td></tr><tr><td>ICD9CM</td></tr><tr><td>ICD10CM</td></tr><tr><td>SNOMED</td></tr><tr><td>PCORNet</td></tr></table></td></tr>
<tr><td>CONDITION_SOURCE</td><td>Derive from Condition_Occurrence.condition_type_concept_id</td><td><table><tr><td colspan="2">OMOP to PCORnet</td></tr><tr><td>38000245</td><td>HC=Healthcare problem list</td></tr></table></td><td><table><tr><td>Concept</td><td>Desciption</td></tr><tr><td>38000245</td><td>EHR problem list entry</td></tr><tr><td>44819221</td><td>Patient-reported</td></tr></table></td></tr>
</table>

		<table><tr><td>44819221</td><td>PC=PCORnet-defined condition algorithm NI=No information</td></tr><tr><td>44814649</td><td>Other</td></tr></table>	
RAW_CONDITION_STATUS	NULL		
RAW_CONDITION	Condition_Occurrence.condition_source_value		
RAW_CONDITION_TYPE	Observation.vocabulary_id	If condition_ source_concept_id is 44814649 (‘Other’), use ‘OT’ (‘Other’). Otherwise, join condition_source_concept_id to Concept.concept_id	
RAW_CONDITION_SOURCE	NULL		

3.1.9 Table: PRESCRIBING

Provider orders for medication dispensing and/or administration.

PRESCRIBING should capture all uniquely recorded in-patient medication dispensing and administration. The PRESCRIBING table in the PCORnet CDM is populated with all records in the DRUG EXPOSURE table with Drug_type_concept_id =

- 38000180 (Inpatient administration),
- 38000179 (Physician administered drug (identified as procedure)),
- 43542358 (Physician administered drug (identified from EHR observation)),
- 43542357 (Physician administered drug (identified from referral record)),
- 38000177 (Prescription written)

If a medication cannot be mapped to RxNorm, it should still be present

PRESCRIBING field mapping:

Destination Field	Source Field	Applied Rule	Comment
PRESCRIBINGID			

PATID	Drug_exposure.person_id		Convert to text
ENCOUNTERID	Drug_exposure.visit_occurrence_id		Convert to text
RX_PROVIDERID	Drug_exposure.provider_id		Convert to text
RX_ORDER_DATE	Drug_exposure.order_date		Order date added to Drug Exposure
RX_ORDER_TIME		Set to NULL	Not available in OMOP
RX_START_DATE	Drug_exposure.drug_exposure_start_date		
RX_END_DATE	Drug_exposure.drug_exposure_end_date		
RX_QUANTITY	Drug_exposure.quantity		
RX_REFILLS	Drug_exposure.refills		
RX_DAYS_SUPPLY	Drug_exposure.days_supply		
RX_FREQUENCY	drug_exposure.frequency	Map the frequency to the PCORnet values: 01=Every day 02=Two times a day (BID) 03=Three times a day (TID) 04=Four times a day (QID) 05=Every morning 06=Every afternoon 07=Before meals 08=After meals 09=As needed (PRN) NI=No information UN=Unknown OT=Other	Frequency added to drug exposure
RX_BASIC	Derive from drug_type_concept_id	If drug_type_concept_id is ‘38000177’ Then 01 (Dispensing) If drug_type_concept_id is IN (‘38000180’,’ 38000179’,’ 43542358’,’ 43542357’) Then 02 (Administration) Else Other	
RXNORM_CUI	Concept.concept_code	Join to Concept table on drug_concept_id = concept_id	vocabulary_id = 'RxNorm'
RAW_RX_MED_NAME	Concept.concept_name	Join to Concept table on drug_concept_id = concept_id	vocabulary_id = 'RxNorm'

RAW_RX_FREQUENCY	Drug_exposure.effective_dose		
RAW_RXNORM_CUI	Concept.concept_code	Join to Concept table on drug_source_concept_id = concept_id	Not limited to RXNORM

3.1.10 Table: DISPENSING

Outpatient pharmacy dispensing, such as prescriptions filled through a neighborhood pharmacy with a claim paid by an insurer. Outpatient dispensing is not commonly captured within healthcare systems.

DISPENSING should capture all uniquely recorded outpatient medication dispensing usually from claims data. The DISPENSING table in the PCORnet CDM is populated with all records in the DRUG EXPOSURE table with Drug_type_concept_id =

- 38000175 (Prescription dispensed in pharmacy),
- 38000176 (Prescription dispensed through mail order)

DISPENSING field mapping:

Destination Field	Source Field	Applied Rule	Comment
DISPENSINGID			
PATID	Drug_exposure.person_id		Convert to text
PRESCRIBINGID	NULL		How to link Precsribing ID to Dispensing ID? Per PCORNet: This is an optional relationship to the PRESCRIBING table, and may not be generally available. One prescribing order may generate multiple dispensing records.
DISPENSE_DATE	Drug_exposure.drug_exposure_start_date		
NDC	JOIN Drug_exposure WITH Vocabulary ON Drug_exposure.drug_source_concept_id = Vocabulary.Concept_ID If vocabulary.vocabulary_id = 'NDC' Then Vocabulary.concept_code Else Map RxNORM code in drug_concept_id to NDC	If one rxNORM code maps to multiple NDC codes, pick the one with lowest concept code.	
DISPENSE_SUP	Drug_exposure.day_supply		
DISPENSE_AMT	Drug_exposure.quantity		

RAW_NDC	Drug_exposure.drug_source_value		

3.1.11 Table: Death

The DEATH table contains one record per unique combination of PATID, DEATH_DATE, and DEATH_SOURCE.
Death field mapping:

Destination Field	Source Field	Applied Rule	Comment
PATID	Death.person_id		Convert to text
DEATH_DATE	Death.death_date		
DEATH_DATE_IMPUTE	'N'= Not Imputed		When date of death is imputed, this field indicates which parts of the date were imputed. Current assumption is that dates are not imputed.
DEATH_SOURCE	'L' = Other, Locally defined	"Other, locally defined" may be used to indicate presence of deaths reported from EHR systems, such as in-patient hospital deaths or dead on arrival.	Possible values: L=Other, locally defined N=National Death Index D=Social Security S=State Death files T=Tumor data NI=No information UN=Unknown OT=Other
DEATH_MATCH_ CONFIDENCE	'E' Excellent		Possible values: E=Excellent F=Fair P=Poor NI=No information UN=Unknown OT=Other

3.1.12 Table: Death Cause

The DEATH_CAUSE table contains one record per unique combination of PATID, DEATH_CAUSE, DEATH_CAUSE_CODE, DEATH_CAUSE_TYPE, and DEATH_CAUSE_SOURCE.
Only create a record when the cause_of_death_concept_id is defined in the OMOP death table.

Death Cause field mapping:

Destination Field	Source Field	Applied Rule	Comment
PATID	Death.person_id		Convert to text
DEATH_CAUSE	Death.cause_of_death_source_value		
DEATH_CAUSE_CODE	Death.cause_of_death_concept_id	Join to vocabulary.concept and derive from vocabulary_id. Use the following: 2 – '09 34 – '10' 0 – 'UN' Else 'OT'	Cause of death code type. Possible values: 09=ICD-9 10=ICD-10 NI=No information UN=Unknown OT=Other
DEATH_CAUSE _TYPE	'NI'= No Information		Possible values: C=Contributory I=Immediate/Primary O=Other U=Underlying NI=No information UN=Unknown OT=Other
DEATH_CAUSE_SOURCE	'L' = Other, Locally defined	"Other, locally defined" may be used to indicate presence of deaths reported from EHR systems, such as in-patient hospital deaths or dead on arrival.	Possible values: C=Contributory I=Immediate/Primary O=Other U=Underlying NI=No information UN=Unknown OT=Other
DEATH_CAUSE_CONFIDENCE	F=Fair		Possible values: E=Excellent F=Fair P=Poor NI=No information UN=Unknown OT=Other

4.0 Outstanding Issues

Immediate

1. Check with OHDSI if concept 44814723 has been corrected: 'Period while enrolled in study' should be changed to 'Geography based'.

Parking lot

1. TBD: Do we transfer to PCORI ‘invalid’ DX’s? For example ‘250.x’ Indicates diabetes but it is not a valid ICD9 code. Those will be stored in OMOP with source_concept_id=0. If yes, will we have DX_TYPE of ‘Other’? Need PCORnet feedback

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[dmt1]Change to agree with updated conventions document
[dmt2]Change to agree with current conventions