README: Python Pipeline for Patient Facts Table

Asset Creators: Madeleine Jones (UVA), Aubrey Winger (UVA), Johanna Loomba (UVA), Andrea Zhou (UVA)

Original Source and Reference:
https://github.com/National-COVID-Cohort-Collaborative/Logic-Liaison-Confirmed-COVID-Positive-Template/blob/main/README%20for%20Logic%20Liaison%20Confirmed%20Covid%20Positive%20Template.pdf

README Sections

- Status
- Purpose
- Required Input Tables
- Use
- Pipeline Functions
- Default Concept Sets Used
- Variable Creation: Comorbidity Indicators Pre and Post COVID
- Data Dictionary

Status

AS OF MAR, 2022: The README has been created following the structure of the original source template and has been updated to reflect the python version of the pipeline.

Purpose

The pipeline provides the code to obtain a summary dataset of COVID-positive patients in a patient-level table called *COVID_Patient_Summary_Table_LDS*. The patient-level table contains one row for each PCR or AG lab positive COVID-19 patient or U07.1 diagnosed COVID-19 patient with a number of commonly referenced facts and indicators derived from the patient datasets.

Required Input Tables

The following external datasets are required for running the pipeline functions:

- LL_DO_NOT_DELETE_REQUIRED_concept_sets_confirmed
- LL_concept_sets_fusion (New_Concepts_Table)
- concept_set_members
- manifest
- person
- measurement
- condition_occurrence
- visit_occurrence

- ED_visits
- hospitalization
- location
- observation
- procedure_occurrence
- device_exposure
- drug_exposure
- death

Use

Import the pipeline with all of its table functions using the line: *from pipeline import **. Then call each function sequentially on the original external datasets to create the pipeline tables. The order of table functions to be called is:

1. *customize_concept_sets*
2. *COHORT*
3. *conditions_of_interest*
4. *observations_of_interest*
5. *procedures_of_interest*
6. *devices_of_interest*
7. *drugs_of_interest, measurements_of_interest*
8. *visits_of_interest*
9. *COVID_deaths*
10. *cohort_all_facts_table*
11. *COVID_Patient_Summary_Table_LDS*

The pipeline_execution.py file is an example of using this script on the University of Virginia Health Data.

Pipeline Functions

Each table in the pipeline is created using a function defined with the table's name. The table functions are outlined below as well as their respective inputs and short descriptions. For more information on each function, use the ? command to view the function docstrings.

customize_concept_sets

- Combines the two concept set inputs
- Inputs: LL_concept_sets_fusion, LL_DO_NOT_DELETE_REQUIRED_concept_sets_confirmed

COHORT

- Identifies the cohort of COVID positive patients

- Inputs: measurement, concept_set_members, person, location, manifest, condition_occurrence, visit_occurrence

conditions_of_interest
- Identify patients with conditions associated with condition concept ids
- Inputs: COHORT, concept_set_members, condition_occurrence, customize_concept_set

observations_of_interest
- Identify patients with observations associated with observation concept ids
- Inputs: observation, concept_set_members, COHORT, customize_concept_sets

procedures_of_interest
- Identify patients with procedures associated with procedure concept ids
- Inputs: COHORT, concept_set_members, procedure_occurrence, customize_concept_sets

devices_of_interest
- Identify patients with device exposure associated with device concept ids
- Inputs: device_exposure, COHORT, concept_set_members, customize_concept_sets

drugs_of_interest
- Identify patients with drug exposure associated with drug concept ids
- Inputs: concept_set_members, drug_exposure, COHORT, customize_concept_sets

measurements_of_interest
- Identify patients with measurements associated with measurement concept ids
- Inputs: measurement, concept_set_members, COHORT

visits_of_interest
- Identify patients with ED and hospital visit concepts within desired timeframe
- Inputs: COHORT, visit_occurrence, concept_set_members

COVID_deaths
- Identify patients with death concept ids
- Inputs: death, COHORT, visit_occurrence, concept_set_members

cohort_all_facts_table

- Creates date level table with one row per COVID-positive patient per date with facts from previous tables
- Inputs: conditions_of_interest, measurements_of_interest, visits_of_interest, procedures_of_interest, observations_of_interest, drugs_of_interest, COVID_deaths, COHORT, devices_of_interest, visit_occurrence

COVID_Patient_Summary_Table_LDS

- Creates summary table with one row per COVID-positive patient with all facts
- Inputs: cohort_all_facts_table, COHORT, visits_of_interest, COVID_deaths, customize_concept_sets

Default Concept Sets Used

This set of comorbidities includes conditions listed in the Charlson Comorbidity Index. However, instead of using Quan et. al list of ICD codes only, we instead created these concept sets using the primary conditions listed in SNOMED-CT hierarchy and including all descendants.

We also created concept sets for each of the comorbidity sections listed on this CDC website as of Dec 2021: CDC "People of any age with the conditions listed below are more likely to get severely ill from COVID-19". Notes regarding each concept set and validation can be found in the Concept Set Browser. Search the comorbidity as named in the variable, but include spaces between words. For example, to look up the concept set used for the "HEARTFAILURE_before_or_day_of_covid_indicator", search "HEART FAILURE" in the concept set browser. Johanna Loomba is the creator of the concept sets used, so you can also use this for your search.

Variable Creation: Comorbidity Indicators Pre and Post COVID

The _post_COVID_indicator columns have a value of 1 if a COVID-19 patient has any record of given comorbidity on any day after the index event. The _before_or_day_of_COVID_indicator columns have a value of 1 if a COVID-19 patient has any record of given comorbidity on the same day or prior to the index event. This decision was made because, for patients whose medical history was captured for the first time on their COVID index date (no prior visits recorded), most chronic conditions captured that day pre-dated infection. HOWEVER, the user should consider excluding conditions flagged as “before or day of COVID” if the variables you choose to generate are less chronic, such as fever. To do this, exclude “before or day of COVID” conditions when the observation_period_before_COVID is zero. To utilize the facts found on the index date as part of the "during COVID" or "post COVID" periods, import this template to allow for study-specific fact indexing of the COVID index or another index date of interest.

Data Dictionary

This data dictionary is made in accordance with the original pipeline dictionary. The variables in the *COVID_Patient_Summary_Table_LDS* are as follows:

person_id, int: Unique identifier for the N3C patient

COVID_first_PCR_or_AG_lab_positive, datetime: Date representing first instance of measurement "*ATLAS SARS-CoV-2 rt-PCR and AG*" with a positive result "*ResultPos*"

COVID_first_diagnosis_date, datetime: Date representing the first instance of a COVID-19 diagnosis *"N3C Covid Diagnosis"* having been charted (when available)

COVID_first_poslab_or_diagnosis_date, datetime: Date representing the first instance of either the measurement "*ATLAS SARS-CoV-2 rt-PCR and AG*" with a positive result "*ResultPos*" or a COVID-19 diagnosis *"N3C Covid Diagnosis"* having been charted (when available). THIS DATE SERVES AS THE INDEX DATE FOR MOST OF THE BELOW VARIABLES.

number_of_visits_before_covid, float: The total number of visit days the patient was recorded having prior to their COVID index event visit, with hospitalizations collapsed to a single visit

observation_period_before_covid, float: The number of days between the patient's earliest recorded visit and the index event

number_of_visits_post_covid, float: The total number of visit days the patient was recorded having after their COVID index event visit, with hospitalizations collapsed to a single visit

observation_period_post_covid, float: The number of days between the patient's index event and last recorded visit

sex, string: gender_concept_name from main OMOP Person Table. Per OMOP ETL conventions, "use the gender or sex value present in the data under the assumption that it is the biological sex at birth. This field should not be used to study gender identity issues. If the source data captures gender identity it should be stored in the OBSERVATION table." Per OHDSI documentation, "the Gender domain captures all concepts about the sex of a person, denoting the biological and physiological characteristics."

city, string: City from location table

state, string: State from location table

postal_code, string: Zip from location table

county, string: County from location table

age_at_covid, int: Calculated age using the year of birth (for L2) or date of birth (for L3) and the date of the index event. As of 7/15/22, July 1st used as placeholder month and day of birth when there are 0s or nulls in the OMOP person table to avoid biasing towards older age.

race, string: "Hispanic or Latino" for anyone with this race, otherwise "Asian", "Black or African American", “Native Hawaiian or Other Pacific Islander”, "American Indian or Alaska Native", "White", or "Other". "Unknown" is assigned to all others. **NOTE**: A number of patients with a source value of Asian or Other Pacific Islander are categorized as “Unknown” until the site is able to differentiate and correct their source values since the current value does not reasonably fall into only one of the 6 minimum race/ethnicity categories defined by the NIH.

race_ethnicity, string: "Hispanic or Latino Any Race" for anyone with this ethnicity, otherwise "Asian Non-Hispanic", "Black or African American Non-Hispanic", “Native Hawaiian or Other Pacific Islander Non-Hispanic”, "American Indian or Alaska Native Non-Hispanic", "White Non-Hispanic", or "Other Non-Hispanic". "Unknown" is assigned to all others. **NOTE**: A number of patients with a source value of Asian or Other Pacific Islander are categorized as “Unknown” until the site is able to differentiate and correct their source values since the current value does not reasonably fall into only one of the 6 minimum race/ethnicity categories defined by the NIH.

data_extraction_date, datetime: The date that the patient's site last ran data extraction scripts for N3C

cdm_name, string: The Clinical Data Model (CDM) associated with this patient's contributing institution (OMOP, TriNetX, ACT, or PCORNet). The different CDMs have different strengths and weaknesses and may result in a pattern of missingness.

cdm_version, float: The version of the Clinical Data Model used by this patient's contributing institution

shift_date_yn, string: Y if the patient's site shifts dates, otherwise N (note that for De-Id L2 data, all the records are shifted, so this field has been uniformly changed to reflect Y for all sites)

max_num_shift_days, float: The maximum number of days that the patient's site shifts dates, otherwise N (note that for De-Id L2 data, all records are shifted, so this field has been uniformly changed to reflect +180 days for all sites)

BMI_max_observed_or_calculated_before_or_day_of_covid, float: The maximum Body Mass Index on the same day or prior to the index event. Default parameters of reasonability are set for height, weight, and BMI, but can be controlled by template user as input parameters. The max reasonable BMI measure "*body mass index"* prior to the index date is reported. Both calculated BMI (using a weight "*Body weight (LG34372-9 and SNOMED)"* and temporally associated height "*Height (LG34373-7 + SNOMED)"* for calculation) and reported BMI as a measure are used to identify the closest measure. If both are available on the same date, the EMR reported BMI is used instead of calculated BMI.

OBESITY_before_or_day_of_covid_indicator, float: Value of 1 if COVID-19 patient has any record of "OBESITY" before or day of index event OR has BMI_max_observed_or_calculated_before_or_day_of_covid > 30.

SYSTEMICCORTICOSTEROIDS_before_or_day_of_covid_indicator, integer: Value of 1 if COVID-19 patient has any record (order or administration) of *“N3C CORTICOSTEROIDS FOR SYSTEMIC USE”* drug prior to the index event. See the "Logic Liaison Tips" section for more information about medications.

Antibody_Neg_before_or_day_of_covid_indicator, float: Value of 1 if COVID-19 patient has any record of *"Atlas #818 [N3C] CovidAntibody retry"* with *"ResultNeg"* value on the same day or prior to the index event.

Antibody_Pos_before_or_day_of_covid_indicator, float: Value of 1 if COVID-19 patient has any record of *"Atlas #818 [N3C] CovidAntibody retry"* with *"ResultPos"* value on the same day or prior to the index event.

number_of_COVID_vaccine_doses_before_or_day_of_covid, long: Count of COVID-19 vaccine doses received by COVID-19 patient on the same day or prior to the index event. See community note regarding N3C vaccination data considerations.

COVID_diagnosis_during_covid_hospitalization_indicator, integer: Value of 1 if the patient had a COVID-19 diagnosis charted between first_COVID_hospitalization_start_date and first_COVID_hospitalization_end_date

LL_IMV_during_covid_hospitalization_indicator, float: Value of 1 if patient had observation, procedure, device_exposure, or condition related to invasive mechanical ventilation *“[ICU/MODS]IMV”* between first_COVID_hospitalization_start_date and first_COVID_hospitalization_end_date

LL_ECMO_during_covid_hospitalization_indicator, float: Value of 1 if patient had observation, procedure, device_exposure, or condition related to *"Kostka - ECMO"* between first_COVID_hospitalization_start_date and first_COVID_hospitalization_end_date

COVIDREGIMENCORTICOSTEROIDS_during_covid_hospitalization_indicator, integer: Value of 1 if COVID-19 patient has any record (order or administration) of "*NIH Systemic Corticosteroids"* drug between first_COVID_hospitalization_start_date and first_COVID_hospitalization_end_date. This concept set was created to reflect Systemic Corticosteroids recommended by NIH for COVID treatment, only oral and IV . NIH Oct 19, 2021 list. **NOTE:** These medications are also often used to treat diseases other than COVID-19. See the "Logic Liaison Tips" section for more information about medications.

REMDISIVIR_during_covid_hospitalization_indicator, integer: Value of 1 if COVID-19 patient has any record (order or administration) of "*Remdesivir"* drug between first_COVID_hospitalization_start_date and first_COVID_hospitalization_end_date. See the "Logic Liaison Tips" section for more information about medications.

COVID_patient_death_during_covid_hospitalization_indicator, float: Value of 1 if patient had death recorded between first_COVID_hospitalization_start_date and first_COVID_hospitalization_end_date

BMI_max_observed_or_calculated_post_covid, float: The maximum Body Mass Index after the index event. Default parameters of reasonability are set for height, weight, and BMI, but can be controlled by template user as input parameters. The max reasonable BMI measure "*body mass index"* after the index date is reported. Both calculated BMI (using a weight *"Body weight (LG34372-9 and SNOMED)"* and temporally associated height *"Height (LG34373-7 + SNOMED)"* for calculation) and reported BMI as a measure are used to identify the closest measure. If both are available on the same date, the EMR reported BMI is used instead of calculated BMI.

OBESITY_post_covid_indicator, float: Value of 1 if COVID-19 patient has any record of "OBESITY" post index event OR has BMI_max_observed_or_calculated_post_covid > 30.

Long_COVID_diagnosis_post_covid_indicator, integer: Value of 1 if the patient has Long COVID Diagnosis U09.9 (concept set *"Long-COVID (PASC)"*)

Long_COVID_clinic_visit_post_covid_indicator, integer: Value of 1 if the patient had any known *"Long COVID Clinic Visit"* [note that not all sites are transmitting this data]

MISC_post_covid_indicator, integer: Value of 1 if COVID-19 patient has any record of *"MULTISYSTEM INFLAMMATORY SYNDROME - CHILDREN"* after the index event.

PNEUMONIADUETOCOVID_post_covid_indicator, integer: Value of 1 if COVID-19 patient has any record of *"PNEUMONIA DUE TO COVID-19"* after the index event.

SYSTEMICCORTICOSTEROIDS_post_covid_indicator, integer: Value of 1 if COVID-19 patient has any record (order or administration) of *“N3C CORTICOSTEROIDS FOR SYSTEMIC USE”* drug following the index event. See the "Logic Liaison Tips" section for more information about medications.

Antibody_Neg_post_covid_indicator, float: Value of 1 if COVID-19 patient has any record of *"Atlas #818 [N3C] CovidAntibody retry"* with *"ResultNeg"* value after the index event.

Antibody_Pos_post_covid_indicator, float: Value of 1 if COVID-19 patient has any record of *"Atlas #818 [N3C] CovidAntibody retry"* with *"ResultPos"* value after the index event.

PCR_AG_Neg_post_covid_indicator, float: Value of 1 if COVID-19 patient has any record of *"ATLAS SARS-CoV-2 rt-PCR and AG"* with *"ResultNeg"* value after the index event.

PCR_AG_Pos_post_covid_indicator, float: Value of 1 if COVID-19 patient has any record of *"ATLAS SARS-CoV-2 rt-PCR and AG"* with *"ResultPos"* value after the index event.

number_of_COVID_vaccine_doses_post_covid, long: Count of COVID-19 vaccine doses received by COVID-19 patient after the index event. See community note regarding N3C vaccination data considerations.

had_at_least_one_reinfection_post_covid_indicator, float: Value of 1 if COVID-19 patient had a positive PCR or AG test > 60 days after the earliest_covid_lab_or_diagnosis date

first_COVID_ED_only_start_date, datetime: Date of first qualifying Emergency Department visit (see COVID_associated_ED_only_visit_indicator)

first_COVID_hospitalization_start_date, datetime: Start date of first qualifying hospitalization (see COVID_associated_hospitalization_indicator)

first_COVID_hospitalization_end_date, datetime: End date of first qualifying hospitalization (see COVID_associated_hospitalization_indicator)

COVID_hospitalization_length_of_stay, float: The number of days from first_COVID_hospitalization_start_date to first_COVID_hospitalization_end_date

COVID_associated_ED_only_visit_indicator, int: Value of 1 if the patient had an Emergency Department visit *"[PASC] ED Visits"* AND a COVID-19 diagnosis *"N3C Covid Diagnosis"* charted in the day prior to 16 days following the index event. This time frame is aligned with the windows used by the CDC. It can be modified in the template. Note also that ED visits that overlap with an admission are considered part of the hospitalization (see microvisit_to_macrovisit table documentation in the enclave), so those patients who first present in the ED but are then admitted instead of discharged will NOT be flagged here. This is also aligned with CDC methods for counting the COVID-19 associated ED visits.

COVID_associated_hospitalization_indicator, int: Value of 1 if the patient was hospitalized in the day prior to 16 days following the index event AND a COVID-19 diagnosis *"N3C Covid Diagnosis"* charted in the day prior to 16 days following the index event. This time frame is aligned with the windows used by the CDC. It can be modified in the template. Note that the N3C microvisit_to_macrovisit table was used to identify hospitalizations (see enclave documentation here).

COVID_patient_death_indicator, float: Value of 1 if the patient had death or discharge to hospice recorded in N3C.

death_within_specified_window_post_covid, float: Value of 1 if the patient had death date occur within specified window following COVID_first_PCR_or_AG_lab_positive. Specified window is defaulted to 60 days which is also utilized for specifying the window in which to look for a reinfection following index event. This can be defined by the template user via the reinfection_wait_time parameter in the cohort_all_facts_table node.

Severity_Type, string: See Community Note "Logic Liaison: Severity Type Definition"

COMORBIDITY indicators before or day of and post- COVID:

The _before_or_day_of_COVID_indicator columns have a value of 1 if COVID-19 patient has any record of given comorbidity on the same day or prior to the index event. The _post_COVID_indicator columns have a value of 1 if COVID-19 patient has any record of given comorbidity on any day after the index event.

TUBERCULOSIS_before_or_day_of_covid_indicator / TUBERCULOSIS_post_covid_indicator, float: Value of 1 if COVID-19 patient has condition *"TUBERCULOSIS"* before or day of / post index event

MILDLIVERDISEASE_before_or_day_of_covid_indicator / MILDLIVERDISEASE_post_covid_indicator, float: Value of 1 if COVID-19 patient has condition *"MILD LIVER DISEASE*" before or day of / post index event

MODERATESEVERELIVERDISEASE_before_or_day_of_covid_indicator / MODERATESEVERELIVERDISEASE_post_covid_indicator, integer: Value of 1 if COVID-19 patient has condition *"MODERATE OR SEVERE LIVER DISEASE*" before or day of / post index event

THALASSEMIA_before_or_day_of_covid_indicator / THALASSEMIA_post_covid_indicator, float: Value of 1 if COVID-19 patient has condition *"THALASSEMIA"* before or day of / post index event

RHEUMATOLOGICDISEASE_before_or_day_of_covid_indicator / RHEUMATOLOGICDISEASE_post_covid_indicator, float: Value of 1 if COVID-19 patient has condition *"RHEUMATOLOGIC DISEASE"* before or day of / post index event

DEMENTIA_before_or_day_of_covid_indicator / DEMENTIA_post_covid_indicator, float: Value of 1 if COVID-19 patient has condition *"DEMENTIA"* before or day of / post index event

CONGESTIVEHEARTFAILURE_before_or_day_of_covid_indicator / CONGESTIVEHEARTFAILURE_post_covid_indicator, float: Value of 1 if COVID-19 patient has condition *"CONGESTIVE HEART FAILURE*" before or day of / post index event

SUBSTANCEUSEDISORDER_before_or_day_of_covid_indicator / SUBSTANCEUSEDISORDER_post_covid_indicator, integer: Value of 1 if COVID-19 patient has condition *"SUBSTANCE USE DISORDER"* before or day of / post index event

DOWNSYNDROME_before_or_day_of_covid_indicator / DOWNSYNDROME_post_covid_indicator, float: Value of 1 if COVID-19 patient has condition *"DOWN SYNDROME"* before or day of / post index event

KIDNEYDISEASE_before_or_day_of_covid_indicator / KIDNEYDISEASE_post_covid_indicator, float: Value of 1 if COVID-19 patient has condition *"KIDNEY DISEASE"* before or day of / post index event.

MALIGNANTCANCER_before_or_day_of_covid_indicator / MALIGNANTCANCER_post_covid_indicator, float: Value of 1 if COVID-19 patient has condition *"MALIGNANT CANCER"* before or day of / post index event

DIABETESCOMPLICATED_before_or_day_of_covid_indicator / DIABETESCOMPLICATED_post_covid_indicator, integer: Value of 1 if COVID-19 patient has condition *"DIABETES COMPLICATED"* before or day of / post index event

CEREBROVASCULARDISEASE_before_or_day_of_covid_indicator / CEREBROVASCULARDISEASE_post_covid_indicator, float: Value of 1 if COVID-19 patient has condition *"CEREBROVASCULAR DISEASE"* before or day of / post index event

PERIPHERALVASCULARDISEASE_before_or_day_of_covid_indicator / PERIPHERALVASCULARDISEASE_post_covid_indicator, float: Value of 1 if COVID-19 patient has condition *"PERIPHERAL VASCULAR DISEASE"* before or day of / post index event

PREGNANCY_before_or_day_of_covid_indicator / PREGNANCY_post_covid_indicator, integer: Value of 1 if COVID-19 patient has condition *"PREGNANT*" before or day of / post index event

HEARTFAILURE_before_or_day_of_covid_indicator / HEARTFAILURE_post_covid_indicator, float: Value of 1 if COVID-19 patient has condition *"HEART FAILURE"* before or day of / post index event

HEMIPLEGIAORPARAPLEGIA_before_or_day_of_covid_indicator / HEMIPLEGIAORPARAPLEGIA_post_covid_indicator, integer: Value of 1 if COVID-19 patient has condition *"HEMIPLEGIA or PARAPLEGIA"* before or day of / post index event.

PSYCHOSIS_before_or_day_of_covid_indicator / PSYCHOSIS_post_covid_indicator, float: Value of 1 if COVID-19 patient has condition *"PSYCHOSIS"* before or day of / post index event

CORONARYARTERYDISEASE_before_or_day_of_covid_indicator / CORONARYARTERYDISEASE_post_covid_indicator, float: Value of 1 if COVID-19 patient has condition *"CORONARY ARTERY DISEASE"* before or day of / post index event

DEPRESSION_before_or_day_of_covid_indicator / DEPRESSION_post_covid_indicator, float: Value of 1 if COVID-19 patient has condition *"DEPRESSION"* before or day of / post index event

METASTATICSOLIDTUMORCANCERS_before_or_day_of_covid_indicator / METASTATICSOLIDTUMORCANCERS_post_covid_indicator, integer: Value of 1 if

COVID-19 patient has condition *"METASTATIC SOLID TUMOR CANCERS"* before or day of / post index event

HIVINFECTION_before_or_day_of_covid_indicator / HIVINFECTION_post_covid_indicator, float: Value of 1 if COVID-19 patient has condition *"HIV INFECTION"* before or day of / post index event

CHRONICLUNGDISEASE_before_or_day_of_covid_indicator / CHRONICLUNGDISEASE_post_covid_indicator, float: Value of 1 if COVID-19 patient has condition *"CHRONIC LUNG DISEASE*" before or day of / post index event

PEPTICULCER_before_or_day_of_covid_indicator / PEPTICULCER_post_covid_indicator, float: Value of 1 if COVID-19 patient has condition *"PEPTIC ULCER"* before or day of / post index event

SICKLECELLDISEASE_before_or_day_of_covid_indicator / SICKLECELLDISEASE_post_covid_indicator, float: Value of 1 if COVID-19 patient has condition *"SICKLE CELL DISEASE"* before or day of / post index event

MYOCARDIALINFARCTION_before_or_day_of_covid_indicator / MYOCARDIALINFARCTION_post_covid_indicator, float: Value of 1 if COVID-19 patient has condition *"MYOCARDIAL INFARCTION*" before or day of / post index event

DIABETESUNCOMPLICATED_before_or_day_of_covid_indicator / DIABETESUNCOMPLICATED_post_covid_indicator, integer: Value of 1 if COVID-19 patient has condition *"DIABETES UNCOMPLICATED"* before or day of / post index event

CARDIOMYOPATHIES_before_or_day_of_covid_indicator / CARDIOMYOPATHIES_post_covid_indicator, float: Value of 1 if COVID-19 patient has condition *"CARDIOMYOPATHIES"* before or day of / post index event

HYPERTENSION_before_or_day_of_covid_indicator / HYPERTENSION_post_covid_indicator, float: Value of 1 if COVID-19 patient has condition *"HYPERTENSION"* before or day of / post index event

OTHERIMMUNOCOMPROMISED_before_or_day_of_covid_indicator / OTHERIMMUNOCOMPROMISED_post_covid_indicator, integer: Value of 1 if COVID-19 patient has condition *"IMMUNODEFICIENCY*" before or day of / post index event

PULMONARYEMBOLISM_before_or_day_of_covid_indicator / PULMONARYEMBOLISM_post_covid_indicator , integer: Value of 1 if COVID-19 patient has condition *"PULMONARY EMBOLISM"* before or day of / post index event

TOBACCOSMOKER_before_or_day_of_covid_indicator / TOBACCOSMOKER_post_covid_indicator, float: Value of 1 if COVID-19 patient has condition *"TOBACCO SMOKER"* before or day of / post index event

SOLIDORGANORBLOODSTEMCELLTRANSPLANT_before_or_day_of_covid_indicator / SOLIDORGANORBLOODSTEMCELLTRANSPLANT_post_covid_indicator, integer: Value of 1 if COVID-19 patient has condition *"TRANSPLANT OF SOLID ORGAN OR BLOOD STEM CELL"* before or day of / post index event