

Package ‘DrugExposure’

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Type Package

Title DrugExposure: To learn patterns of Medication Compliance, Aderence and Persistence

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Description The DrugExposure R package analyzes medication compliance and persistence in cohorts. It assesses drug utilization from first exposure, calculates key metrics like medication possession ratio and proportional days covered, and enhances insights into real-world adherence to improve patient outcomes.

Depends DatabaseConnector (>= 5.0.0),
R (>= 4.1.0)

Imports checkmate,
CirceR,
CohortGenerator,
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lifecycle,
rlang,
SqlRender

Suggests Eunomia,
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RJSONIO,
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withr

Remotes CirceR

License Apache License

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VignetteBuilder knitr

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URL <https://ohdsi.github.io/DrugExposure/>, <https://github.com/OHDSI/DrugExposure>

BugReports <https://github.com/OHDSI/DrugExposure/issues>

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createCodeSetTableFromConceptSetExpression

Generate a Temporary Codeset Table from a Concept Set Expression

Description

This function takes a Circe-generated conceptSetExpression object (list) and creates a temporary table containing unique concept IDs.

Usage

```
createCodeSetTableFromConceptSetExpression(
  connection,
  vocabularyDatabaseSchema,
  conceptSetExpression,
  tempEmulationSchema = getOption("sqlRenderTempEmulationSchema"),
  conceptSetTable = "#concept_sets"
)
```

Arguments

- | | |
|--------------------------|--|
| connection | An object of type connection as created using the connect function in the DatabaseConnector package. Can be left NULL if connectionDetails is provided, in which case a new connection will be opened at the start of the function, and closed when the function finishes. |
| vocabularyDatabaseSchema | Schema name where your OMOP vocabulary data resides. This is commonly the same as cdmDatabaseSchema. Note that for SQL Server, this should include both the database and schema name, for example 'vocabulary.dbo'. |
| conceptSetExpression | A R object (list) that is conforming to OHDSI Circe concept set expression. Usually from ROhdsiWebApi. Defines the concept set expression as r list object. This is converted to json and given to CirceR to get concept set expression sql. |
| tempEmulationSchema | Some database platforms like Oracle and Impala do not truly support temp tables. To emulate temp tables, provide a schema with write privileges where temp tables can be created. |
| conceptSetTable | The name of a remote temp table that has the unique concept_id. Should have column name concept_id and be unique. |

defaultCohortGeneratorSubsetOperator

Create Default Subset Operators for Cohort Generation

Description

This function configures a set of default subset operators used in cohort generation. It uses CohortGenerator package subset operator, and allows for easily specifying demographic and temporal parameters to subset a cohort and create a new cohort.

Usage

```
defaultCohortGeneratorSubsetOperator(
  minAge = 0,
  maxAge = 90,
  genderSubset = c(8532, 8507),
  restrictToEarliestOccurrence = TRUE,
  race = NULL,
  calendarStartDate = "2016-01-01",
  calendarEndDate = Sys.Date() - 365,
  priorTime = 365,
  followUpTime = 365,
  ethnicity = NULL,
  limitTo = "firstEver"
)
```

Arguments

minAge	Integer, optional. The minimum age at first drug exposure. Defaults to 0 years.
maxAge	Integer, optional. The maximum age at first drug exposure. Defaults to 90 years.
genderSubset	Numeric vector, optional. Identifies genders using concept IDs. Defaults to c(8532, 8507).
restrictToEarliestOccurrence	Logical, optional. Specifies whether to restrict the analysis to the earliest occurrence of the drug exposure. Defaults to TRUE.
race	Integer, optional. Concept ID for specifying race.
calendarStartDate	Date, optional. Specifies the earliest date from which to consider drug exposures, used to left-censor data. Defaults to '2016-01-01'.
calendarEndDate	Date, optional. The latest date up to which to consider drug exposures, used to right-censor data. By default, it is set to one year before the current date to account for claims accrual lag.
priorTime	Integer, optional. Represents the number of days of prior observation required before the start of drug exposure. Defaults to 365 days.
followUpTime	Integer, optional. Represents the number of days of follow-up observation after the start of drug exposure. Defaults to 365 days.
ethnicity	Integer, optional. Concept ID for specifying ethnicity.

limitTo Character, optional. Describes whether to restrict the analysis to the first-ever observation period or to all observation periods with drug exposure. Defaults to 'firstEver'.

Value

A list of configured subset operators suitable for use in cohort generation functions.

Examples

```
defaultCohortGeneratorSubsetOperator(
  minAge = 18,
  maxAge = 65,
  genderSubset = c(8532),
  restrictToEarliestOccurrence = FALSE,
  race = 2106,
  calendarStartDate = as.Date("2010-01-01"),
  calendarEndDate = as.Date("2020-12-31"),
  priorTime = 180,
  followUpTime = 180,
  ethnicity = 38003564,
  limitTo = "all"
)
```

```
getDrugExposureInDenominatorCohort
```

get drug exposure events for a person

Description

Given a concept set expression and a denominator cohort to restrict the persons and exposure event to period in the denominator cohort, this function creates a temp table that has the records from drug_exposure table.

Usage

```
getDrugExposureInDenominatorCohort(
  connection = NULL,
  conceptSetExpression,
  cdmDatabaseSchema,
  tempEmulationSchema = getOption("sqlRenderTempEmulationSchema"),
  conceptSetTable = "#concept_sets",
  denominatorCohortDatabaseSchema = NULL,
  denominatorCohortTable = "#denominator",
  denominatorCohortId = 0,
  drugExposureOutputTable = "#drug_exposure"
)
```

Arguments

connection	An object of type connection as created using the connect function in the DatabaseConnector package. Can be left NULL if connectionDetails is provided, in which case a new connection will be opened at the start of the function, and closed when the function finishes.
conceptSetExpression	A R object (list) that is conforming to OHDSI Circe concept set expression. Usually from ROhdsiWebApi. Defines the concept set expression as r list object. This is converted to json and given to CirceR to get concept set expression sql.
cdmDatabaseSchema	Schema name where your patient-level data in OMOP CDM format resides. Note that for SQL Server, this should include both the database and schema name, for example 'cdm_data.dbo'.
tempEmulationSchema	Some database platforms like Oracle and Impala do not truly support temp tables. To emulate temp tables, provide a schema with write privileges where temp tables can be created.
conceptSetTable	The name of a remote temp table that has the unique concept_id. Should have column name concept_id and be unique.
denominatorCohortDatabaseSchema	The cohort database schema that has the denominator cohort.
denominatorCohortTable	The cohort table name that has the denominator cohort.
denominatorCohortId	The cohort id of the denominator cohort.
drugExposureOutputTable	the output table

getNumeratorCohorts *Create Numerator Cohorts*

Description

This function takes an input a cohort (called denominator to bind the numerator cohort to), a concept set expression to create the numerator cohort.

Usage

```
getNumeratorCohorts(
  connection = NULL,
  cdmDatabaseSchema,
  tempEmulationSchema = getOption("sqlRenderTempEmulationSchema"),
  numeratorCohortTableName = "#numerator",
  drugExposureTable = "#drug_exposure",
  persistenceDays = c(0),
  baseCohortDefinitionId = 100
)
```

Arguments

connection	An object of type connection as created using the connect function in the DatabaseConnector package. Can be left NULL if connectionDetails is provided, in which case a new connection will be opened at the start of the function, and closed when the function finishes.
cdmDatabaseSchema	Schema name where your patient-level data in OMOP CDM format resides. Note that for SQL Server, this should include both the database and schema name, for example 'cdm_data.dbo'.
tempEmulationSchema	Some database platforms like Oracle and Impala do not truly support temp tables. To emulate temp tables, provide a schema with write privileges where temp tables can be created.
numeratorCohortTableBaseName	The name of the output table
drugExposureTable	The name of the table with "#drug_exposure". Should be a temp table.
persistenceDays	Number of days to check for persistence of drug exposure.
baseCohortDefinitionId	The minimum cohortId to create cohorts for all persistenceDays

runDrugExposure	<i>Run Drug Exposure Analysis</i>
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Description

This function takes as a input a Circe compatible concept set expression (as r list object that can be converted to json), a denominator cohort or a set of rules to create the denominator cohort, and checks for occurrence of drug exposure events in the drug_exposure table of the CDM for the conceptId in the given concept expression in the period and for the subjects in the denominator cohort. It then computes a series of drug utilization metrics (adherence, persistence, utilization, patterns) and reports returns a list of objects that maybe utilized in a drug exposure report.

Usage

```
runDrugExposure(
  connectionDetails = NULL,
  connection = NULL,
  conceptSetExpression,
  cdmDatabaseSchema,
  denominatorCohortDatabaseSchema,
  denominatorCohortTable,
  denominatorCohortId,
  vocabularyDatabaseSchema = cdmDatabaseSchema,
  tempEmulationSchema = getOption("sqlRenderTempEmulationSchema"),
  persistenceDays = c(0)
)
```

Arguments

connectionDetails	An object of type connectionDetails as created using the createConnectionDetails function in the DatabaseConnector package. Can be left NULL if connection is provided.
connection	An object of type connection as created using the connect function in the DatabaseConnector package. Can be left NULL if connectionDetails is provided, in which case a new connection will be opened at the start of the function, and closed when the function finishes.
conceptSetExpression	A R object (list) that is conforming to OHDSI Circe concept set expression. Usually from ROhdsiWebApi. Defines the concept set expression as r list object. This is converted to json and given to CirceR to get concept set expression sql.
cdmDatabaseSchema	Schema name where your patient-level data in OMOP CDM format resides. Note that for SQL Server, this should include both the database and schema name, for example 'cdm_data.dbo'.
denominatorCohortDatabaseSchema	The cohort database schema that has the denominator cohort.
denominatorCohortTable	The cohort table name that has the denominator cohort.
denominatorCohortId	The cohort id of the denominator cohort.
vocabularyDatabaseSchema	Schema name where your OMOP vocabulary data resides. This is commonly the same as cdmDatabaseSchema. Note that for SQL Server, this should include both the database and schema name, for example 'vocabulary.dbo'.
tempEmulationSchema	Some database platforms like Oracle and Impala do not truly support temp tables. To emulate temp tables, provide a schema with write privileges where temp tables can be created.
persistenceDays	(optional) Number of days to check for persistence of drug exposure. Can take a array of days, and report will be generated for all.

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