

# Package ‘PhenotypeR’

January 20, 2025

**Type** Package

**Title** Assess Study Cohorts Using a Common Data Model

**Version** 0.1.1

**Description** Phenotype study cohorts in data mapped to the Observational Medical Outcomes Partnership Common Data Model. Diagnostics are run at the database, code list, cohort, and population level to assess whether study cohorts are ready for research.

**License** Apache License ( $\geq 2$ )

**Encoding** UTF-8

**Depends** R ( $\geq 4.0$ )

**Suggests** CDMConnector ( $\geq 1.6.1$ ), duckdb, DBI, gt, omock, testthat ( $\geq 3.0.0$ ), knitr, visOmopResults ( $\geq 0.5.0$ ), glue, RPostgres, PatientProfiles ( $\geq 1.2.2$ ), ggplot2, ggpubr, stringr, shiny, DiagrammeR, sortable, shinycssloaders, here, DT, bslib, shinyWidgets, plotly, tidyr, scales

**Config/testthat/edition** 3

**RoxygenNote** 7.3.2

**Imports** CodelistGenerator ( $\geq 3.3.1$ ), CohortCharacteristics ( $\geq 0.4.0$ ), CohortConstructor ( $\geq 0.3.2$ ), cli, dplyr, IncidencePrevalence ( $\geq 0.9.0$ ), omopgenerics ( $\geq 0.4.0$ ), OmopSketch ( $\geq 0.1.2$ ), magrittr, purrr, rlang, vctrs, usethis

**URL** <https://ohdsi.github.io/PhenotypeR/>

**VignetteBuilder** knitr

**NeedsCompilation** no

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**Repository** CRAN

**Date/Publication** 2025-01-17 19:00:02 UTC

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addCodelistAttribute *Adds the cohort\_codelist attribute to a cohort*

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### Description

‘addCodelistAttribute()’ allows the users to add a codelist to a cohort in OMOP CDM.

This is particularly important for the use of ‘codelistDiagnostics()’, as the underlying assumption is that the cohort that is fed into ‘codelistDiagnostics()’ has a cohort\_codelist attribute attached to it.

### Usage

```
addCodelistAttribute(cohort, codelist, cohortName = names(codelist))
```

### Arguments

cohort	Cohort table in a cdm reference
codelist	Named list of concepts
cohortName	For each element of the codelist, the name of the cohort in ‘cohort’ to which the codelist refers

### Value

A cohort

### Examples

```
library(PhenotypeR)

cdm <- mockPhenotypeR()

cohort <- addCodelistAttribute(cohort = cdm$my_cohort, codelist = list("cohort_1" = 1L))
attr(cohort, "cohort_codelist")

CDMConnector::cdmDisconnect(cdm)
```

---

codelistDiagnostics    *Run codelist-level diagnostics*

---

### Description

'codelistDiagnostics()' runs phenotypeR diagnostics on the cohort\_codelist attribute on the cohort. Thus codelist attribute of the cohort must be populated. If it is missing then it could be populated using 'addCodelistAttribute()' function.

Furthermore 'codelistDiagnostics()' requires achilles tables to be present in the cdm so that concept counts could be derived.

### Usage

```
codelistDiagnostics(cohort)
```

### Arguments

cohort            A cohort table in a cdm reference. The cohort\_codelist attribute must be populated. The cdm reference must contain achilles tables as these will be used for deriving concept counts.

### Value

A summarised result

### Examples

```
library(CohortConstructor)
library(PhenotypeR)

cdm <- mockPhenotypeR()

cdm$arthropathies <- conceptCohort(cdm,
                                  conceptSet = list("arthropathies" = c(40475132)),
                                  name = "arthropathies")

result <- codelistDiagnostics(cdm$arthropathies)

CDMConnector::cdmDisconnect(cdm = cdm)
```

cohortDiagnostics      *Run cohort-level diagnostics*

---

### Description

Runs phenotypeR diagnostics on the cohort. The diagnostics include: \* Age groups and sex summarised. \* A summary of visits of everyone in the cohort using visit\_occurrence table. \* A summary of age and sex density of the cohort. \* Attritions of the cohorts. \* Overlap between cohorts (if more than one cohort is being used).

### Usage

```
cohortDiagnostics(cohort)
```

### Arguments

cohort                  Cohort table in a cdm reference

### Value

A summarised result

### Examples

```
library(PhenotypeR)

cdm <- mockPhenotypeR()

result <- cohortDiagnostics(cdm$my_cohort)

CDMConnector::cdmDisconnect(cdm = cdm)
```

---

databaseDiagnostics      *Database diagnostics*

---

### Description

phenotypeR diagnostics on the cdm object.

Diagnostics include: \* Summarise a cdm\_reference object, creating a snapshot with the metadata of the cdm\_reference object. \* Summarise the observation period table getting some overall statistics in a summarised\_result object.

### Usage

```
databaseDiagnostics(cdm)
```

**Arguments**

cdm                    CDM reference

**Value**

A summarised result

**Examples**

```
library(PhenotypeR)
cdm <- mockPhenotypeR()
result <- databaseDiagnostics(cdm)
CDMConnector::cdmDisconnect(cdm = cdm)
```

---

matchedDiagnostics      *Compare characteristics of cohort matched to database population*

---

**Description**

A summary of the cohort that is matched to the original cohort that has been given by the user. Such summary contains basic cohort summary including number of visits within one year prior of the cohort\_start\_date, as well as a large scale characteristics using the following domains of OMOP CDM:

\* condition\_occurrence \* visit\_occurrence \* measurement \* procedure\_occurrence \* observation \* drug\_exposure

**Usage**

```
matchedDiagnostics(cohort, matchedSample = 1000)
```

**Arguments**

cohort                    Cohort table in a cdm reference

matchedSample      The number of people to take a random sample for matching. If NULL, no sampling will be performed.

**Value**

A summarised result

**Examples**

```
library(PhenotypeR)

cdm <- mockPhenotypeR()

result <- matchedDiagnostics(cdm$my_cohort)

CDMConnector::cdmDisconnect(cdm = cdm)
```

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mockPhenotypeR	<i>Function to create a mock cdm reference for mockPhenotypeR</i>
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**Description**

'mockPhenotypeR()' creates an example dataset that can be used to show how the package works

**Usage**

```
mockPhenotypeR(
  nPerson = 100,
  con = DBI::dbConnect(duckdb::duckdb()),
  writeSchema = "main",
  seed = 111
)
```

**Arguments**

nPerson	number of people in the cdm.
con	A DBI connection to create the cdm mock object.
writeSchema	Name of an schema on the same connection with writing permissions.
seed	seed to use when creating the mock data.

**Value**

cdm object

**Examples**

```
library(PhenotypeR)

cdm <- mockPhenotypeR()

cdm
```

---

phenotypeDiagnostics *Phenotype a cohort*

---

## Description

This comprises all the diagnostics that are being offered in this package, this includes:

\* A diagnostics on the database via 'databaseDiagnostics'. \* A diagnostics on the cohort\_codelist attribute of the cohort via 'codelistDiagnostics'. \* A diagnostics on the cohort via 'cohortDiagnostics'. \* A diagnostics on the population via 'populationDiagnostics'. \* A diagnostics on the matched cohort via 'matchedDiagnostics'.

## Usage

```
phenotypeDiagnostics(  
  cohort,  
  databaseDiagnostics = TRUE,  
  codelistDiagnostics = TRUE,  
  cohortDiagnostics = TRUE,  
  populationDiagnostics = TRUE,  
  populationSample = 1e+06,  
  populationDateRange = as.Date(c(NA, NA)),  
  matchedDiagnostics = TRUE,  
  matchedSample = 1000  
)
```

## Arguments

cohort	Cohort table in a cdm reference
databaseDiagnostics	If TRUE, database diagnostics will be run.
codelistDiagnostics	If TRUE, codelist diagnostics will be run.
cohortDiagnostics	If TRUE, cohort diagnostics will be run.
populationDiagnostics	If TRUE, population diagnostics will be run.
populationSample	Number of people from the cdm to sample. If NULL no sampling will be performed
populationDateRange	Two dates. The first indicating the earliest cohort start date and the second indicating the latest possible cohort end date. If NULL or the first date is set as missing, the earliest observation_start_date in the observation_period table will be used for the former. If NULL or the second date is set as missing, the latest observation_end_date in the observation_period table will be used for the latter.

matchedDiagnostics

If TRUE, cohort to population diagnostics will be run.

matchedSample The number of people to take a random sample for matching. If NULL, no sampling will be performed.

### Value

A summarised result

### Examples

```
library(PhenotypeR)

cdm <- mockPhenotypeR()

result <- phenotypeDiagnostics(cdm$my_cohort)

CDMConnector::cdmDisconnect(cdm = cdm)
```

---

populationDiagnostics *Population-level diagnostics*

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### Description

phenotypeR diagnostics on the cohort of input with relation to a denomination population. Diagnostics include:

\* Incidence \* Prevalence

### Usage

```
populationDiagnostics(
  cohort,
  populationSample = 1e+06,
  populationDateRange = as.Date(c(NA, NA))
)
```

### Arguments

cohort Cohort table in a cdm reference

populationSample

Number of people from the cdm to sample. If NULL no sampling will be performed

populationDateRange

Two dates. The first indicating the earliest cohort start date and the second indicating the latest possible cohort end date. If NULL or the first date is set as missing, the earliest observation\_start\_date in the observation\_period table will be used for the former. If NULL or the second date is set as missing, the latest observation\_end\_date in the observation\_period table will be used for the latter.



**Value**

A summarised result

**Examples**

```
library(PhenotypeR)
library(dplyr)

cdm <- mockPhenotypeR()

dateStart <- cdm$my_cohort |>
  summarise(start = min(cohort_start_date, na.rm = TRUE)) |>
  pull("start")
dateEnd <- cdm$my_cohort |>
  summarise(start = max(cohort_start_date, na.rm = TRUE)) |>
  pull("start")

result <- cdm$my_cohort |>
  populationDiagnostics(populationDateRange = c(dateStart, dateEnd))

CDMConnector::cdmDisconnect(cdm = cdm)
```

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shinyDiagnostics

*Create a shiny app summarising your phenotyping results*


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**Description**

A shiny app that is designed for any diagnostics results from phenotypeR, this includes:

\* A diagnostics on the database via ‘databaseDiagnostics’. \* A diagnostics on the cohort\_codelist attribute of the cohort via ‘codelistDiagnostics’. \* A diagnostics on the cohort via ‘cohortDiagnostics’. \* A diagnostics on the population via ‘populationDiagnostics’. \* A diagnostics on the matched cohort via ‘matchedDiagnostics’.

**Usage**

```
shinyDiagnostics(result, directory, open = rlang::is_interactive())
```

**Arguments**

result	A summarised result
directory	Directory where to save report
open	If TRUE, the shiny app will be launched in a new session. If FALSE, the shiny app will be created but not launched.

**Value**

A shiny app

**Examples**

```
library(PhenotypeR)

cdm <- mockPhenotypeR()

result <- phenotypeDiagnostics(cdm$my_cohort)

shinyDiagnostics(result, tempdir())

CDMConnector::cdmDisconnect(cdm = cdm)
```

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