

# Package: DrugExposureDiagnostics (via r-universe)

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**Title** Diagnostics for OMOP Common Data Model Drug Records

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**Description** Ingredient specific diagnostics for drug exposure records in the Observational Medical Outcomes Partnership (OMOP) common data model.

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**Suggests** testthat (>= 3.0.0), duckdb, odbc, DBI, knitr, rmarkdown, zip, lubridate, tibble, DT, graphics, SqlRender, magick, DiagrammeRsvg, ggplot2, cowplot, plotly

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**URL** <https://darwin-eu.github.io/DrugExposureDiagnostics/>,  
<https://github.com/darwin-eu/DrugExposureDiagnostics>

**BugReports** <https://github.com/darwin-eu/DrugExposureDiagnostics/issues>

**VignetteBuilder** knitr

**Language** en-US

**Repository** <https://darwin-eu.r-universe.dev>

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checkDaysSupply	<i>Check if Days_supply is the same as datediff(drug_exp_start_date,drug_exp_end_date)</i>
-----------------	--

---

### Description

Check if Days\_supply is the same as datediff(drug\_exp\_start\_date,drug\_exp\_end\_date)

### Usage

```
checkDaysSupply(
  cdm,
  drugRecordsTable = "ingredient_drug_records",
  byConcept = TRUE,
  sampleSize = 10000
)
```

**Arguments**

cdm	CDMConnector reference object
drugRecordsTable	a modified version of the drug exposure table, default "ingredient_drug_records"
byConcept	whether to get result by drug concept
sampleSize	the sample size given in execute checks

**Value**

a table with the stats of days supply compared to start and end date

---

checkDbType	<i>Check the database type.</i>
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---

**Description**

Check the database type.

**Usage**

```
checkDbType(cdm, type = "cdm_reference", messageStore)
```

**Arguments**

cdm	CDMConnector reference object
type	type of the database, default cdm_reference
messageStore	checkmate collection

---

checkDrugDose	<i>Get a summary of the daily drug dose</i>
---------------	---

---

**Description**

Get a summary of the daily drug dose

**Usage**

```
checkDrugDose(cdm, ingredientConceptId, minCellCount = 5)
```

**Arguments**

cdm	CDMConnector reference object
ingredientConceptId	ingredient
minCellCount	minimum number of events to report- results lower than this will be obscured. If NULL all results will be reported.

**Value**

a table with the stats about the daily dose

---

checkDrugSig	<i>Check the drug sig field; this is the verbatim instruction for the drug as written by the provider.</i>
--------------	--

---

**Description**

Check the drug sig field; this is the verbatim instruction for the drug as written by the provider.

**Usage**

```
checkDrugSig(
  cdm,
  drugRecordsTable = "ingredient_drug_records",
  byConcept = TRUE,
  sampleSize = 10000
)
```

**Arguments**

cdm	CDMConnector reference object
drugRecordsTable	a modified version of the drug exposure table, default "ingredient_drug_records"
byConcept	whether to get result by drug concept
sampleSize	the sample size given in execute checks

**Value**

a table with a summary of the sig values

---

checkIngredientInTable	<i>Check ingredient is present in given table</i>
------------------------	---

---

**Description**

Check ingredient is present in given table

**Usage**

```
checkIngredientInTable(cdm, conceptId, tableName, messageStore)
```

**Arguments**

cdm	CDMConnector reference object
conceptId	ingredient concept id to check
tableName	name of the table to check
messageStore	checkmate collection

---

checkIsIngredient	<i>Check is an ingredient</i>
-------------------	-------------------------------

---

**Description**

Check is an ingredient

**Usage**

```
checkIsIngredient(cdm, conceptId, messageStore)
```

**Arguments**

cdm	CDMConnector reference object
conceptId	ingredient concept id to check
messageStore	checkmate collection

---

checkLogical	<i>Check if given object is a boolean.</i>
--------------	--

---

**Description**

Check if given object is a boolean.

**Usage**

```
checkLogical(input, messageStore, null.ok = TRUE)
```

**Arguments**

input	the input
messageStore	checkmate collection
null.ok	if value null is allowed

---

checkSampleMinCellCount

*Check that the sample is bigger than the mincellcount*

---

### **Description**

Check that the sample is bigger than the mincellcount

### **Usage**

checkSampleMinCellCount(sampleSize, minCellCount, messageStore)

### **Arguments**

sampleSize	sample size for sampling
minCellCount	minimum cell count below which to obscure results
messageStore	checkmate collection

---

checkTableExists

*Check if given table exists in cdm.*

---

### **Description**

Check if given table exists in cdm.

### **Usage**

checkTableExists(cdm, tableName, messageStore)

### **Arguments**

cdm	CDMConnector reference object
tableName	checkmate collection
messageStore	the message store

---

checkVerbatimEndDate    *Check the verbatim\_end\_date field*

---

### Description

Check the verbatim\_end\_date field

### Usage

```
checkVerbatimEndDate(
  cdm,
  drugRecordsTable = "ingredient_drug_records",
  byConcept = TRUE,
  sampleSize = 10000
)
```

### Arguments

cdm	CDMConnector reference object
drugRecordsTable	a modified version of the drug exposure table, default "ingredient_drug_records"
byConcept	whether to get result by drug concept
sampleSize	the sample size given in execute checks

### Value

a table with the stats about the verbatim\_end\_date

---

computeDBQuery	<i>Store the given input in a remote database table. It will be stored either in a permanent table or a temporary table depending on tablePrefix.</i>
----------------	---

---

### Description

Store the given input in a remote database table. It will be stored either in a permanent table or a temporary table depending on tablePrefix.

### Usage

```
computeDBQuery(table, tablePrefix, tableName, cdm, overwrite = TRUE)
```

**Arguments**

table	the input table
tablePrefix	The stem for the permanent tables that will be created when running the diagnostics. Permanent tables will be created using this prefix, and any existing tables that start with this will be at risk of being dropped or overwritten. If NULL, temporary tables will be used throughout.
tableName	the input table
cdm	cdm reference object
overwrite	if the table should be overwritten (default TRUE).

**Value**

reference to the table

---

executeChecks	<i>Execute given checks on Drug Exposure.</i>
---------------	---

---

**Description**

Execute given checks on Drug Exposure.

**Usage**

```
executeChecks(
  cdm,
  ingredients = c(1125315),
  subsetToConceptId = NULL,
  checks = c("missing", "exposureDuration", "quantity"),
  minCellCount = 5,
  sample = 10000,
  tablePrefix = NULL,
  earliestStartDate = "2010-01-01",
  verbose = FALSE,
  byConcept = TRUE
)
```

**Arguments**

cdm	CDMConnector reference object
ingredients	vector of ingredients, by default: acetaminophen
subsetToConceptId	vector of concept IDs of the ingredients to filter. If a concept ID is positive it will be included, a negative one will be excluded. If NULL, all concept IDs for an ingredient will be considered.



checks	the checks to be executed, by default the missing values, the exposure duration and the quantity. Possible options are "missing", "exposureDuration", "type", "route", "sourceConcept", "daysSupply", "verbatimEndDate", "dose", "sig", "quantity" and "diagnosticsSummary"
minCellCount	minimum number of events to report- results lower than this will be obscured. If NULL all results will be reported.
sample	the number of samples, default 10.000
tablePrefix	The stem for the permanent tables that will be created when running the diagnostics. Permanent tables will be created using this prefix, and any existing tables that start with this will be at risk of being dropped or overwritten. If NULL, temporary tables will be used throughout.
earliestStartDate	the earliest date from which a record can be included
verbose	verbose, default FALSE
byConcept	boolean argument whether to return results by Concept or overall only

**Value**

named list with results

**Examples**

```
## Not run:
db <- DBI::dbConnect(" Your database connection here ")
cdm <- CDMConnector::cdm_from_con(
  con = db,
  cdm_schema = "cdm schema name"
)
result <- executeChecks(
  cdm = cdm,
  ingredients = c(1125315))

## End(Not run)
```

---

executeChecksSingleIngredient

*Execute given checks on Drug Exposure for a single ingredient.*

---

**Description**

Execute given checks on Drug Exposure for a single ingredient.

**Usage**

```
executeChecksSingleIngredient(
  cdm,
  ingredient = 1125315,
  subsetToConceptId = NULL,
  checks = c("missing", "exposureDuration", "quantity"),
  minCellCount = 5,
  sampleSize = 10000,
  tablePrefix = NULL,
  earliestStartDate = "2010-01-01",
  verbose = FALSE,
  byConcept = FALSE
)
```

**Arguments**

<code>cdm</code>	CDMConnector reference object
<code>ingredient</code>	ingredient, by default: acetaminophen
<code>subsetToConceptId</code>	vector of concept IDs of the ingredients to filter. If a concept ID is positive it will be included, a negative one will be excluded. If NULL, all concept IDs for an ingredient will be considered.
<code>checks</code>	the checks to be executed, by default the missing values, the exposure duration and the quantity.
<code>minCellCount</code>	minimum number of events to report- results lower than this will be obscured. If NULL all results will be reported.
<code>sampleSize</code>	the number of samples, default 10.000
<code>tablePrefix</code>	The stem for the permanent tables that will be created when running the diagnostics. Permanent tables will be created using this prefix, and any existing tables that start with this will be at risk of being dropped or overwritten. If NULL, temporary tables will be used throughout.
<code>earliestStartDate</code>	the earliest date from which a record can be included
<code>verbose</code>	verbose, default FALSE
<code>byConcept</code>	boolean argument whether to return results by Concept or overall only

**Value**

named list with results

---

getDrugMissings	<i>Check missings in drug exposure records</i>
-----------------	--

---

**Description**

Check missings in drug exposure records

**Usage**

```
getDrugMissings(  
  cdm,  
  drugRecordsTable = "ingredient_drug_records",  
  byConcept = TRUE,  
  sampleSize = 10000  
)
```

**Arguments**

cdm	CDMConnector reference object
drugRecordsTable	a modified version of the drug exposure table, default "ingredient_drug_records"
byConcept	by individual drug Concept
sampleSize	the sample size given in execute checks

**Value**

a table with a summary of missing records

---

getDrugRecords	<i>Drug exposure records for ingredients of interest</i>
----------------	--

---

**Description**

Drug exposure records for ingredients of interest

**Usage**

```
getDrugRecords(  
  cdm,  
  ingredient,  
  includedConceptsTable,  
  drugRecordsTable = "drug_exposure",  
  tablePrefix = NULL,  
  verbose = FALSE  
)
```

**Arguments**

cdm	CDMConnector reference object
ingredient	Concept ID for ingredient of interest
includedConceptsTable	includedConceptsTable
drugRecordsTable	drugRecordsTable, default "drug_exposure"
tablePrefix	The stem for the permanent tables that will be created when running the diagnostics. Permanent tables will be created using this prefix, and any existing tables that start with this will be at risk of being dropped or overwritten. If NULL, temporary tables will be used throughout.
verbose	verbose

**Value**

a table containing drug exposure records

---

getDrugRoutes	<i>Get drug exposure route types</i>
---------------	--------------------------------------

---

**Description**

Get drug exposure route types

**Usage**

```
getDrugRoutes(
  cdm,
  drugRecordsTable = "ingredient_drug_records",
  byConcept = TRUE,
  sampleSize = 10000
)
```

**Arguments**

cdm	CDMConnector reference object
drugRecordsTable	a modified version of the drug exposure table, default "ingredient_drug_records"
byConcept	by individual drug Concept
sampleSize	the sample size given in execute checks

**Value**

a table with the drug exposure route types

---

getDrugSourceConcepts *Check drug exposure source types*

---

**Description**

Check drug exposure source types

**Usage**

```
getDrugSourceConcepts(  
    cdm,  
    drugRecordsTable = "ingredient_drug_records",  
    sampleSize = 10000  
)
```

**Arguments**

cdm	CDMConnector reference object
drugRecordsTable	modified drug exposure table
sampleSize	the sample size given in execute checks

**Value**

a table with the drug source concepts

---

getDrugStrength *Drug strength records for ingredients of interest*

---

**Description**

Drug strength records for ingredients of interest

**Usage**

```
getDrugStrength(  
    cdm,  
    ingredient,  
    includedConceptsTable = "ingredient_concepts",  
    drugStrengthTable = "drug_strength",  
    tablePrefix = NULL,  
    verbose = FALSE  
)
```

**Arguments**

cdm	CDMConnector reference object
ingredient	ingredient concept ID for ingredient of interest
includedConceptsTable	table name for the concept ids, names and units
drugStrengthTable	table name for drug strength, default "drug_strength"
tablePrefix	The stem for the permanent tables that will be created when running the diagnostics. Permanent tables will be created using this prefix, and any existing tables that start with this will be at risk of being dropped or overwritten. If NULL, temporary tables will be used throughout.
verbose	verbose

**Value**

a table containing drug strength records

---

getDrugTypes	<i>Get drug exposure record types</i>
--------------	---------------------------------------

---

**Description**

Get drug exposure record types

**Usage**

```
getDrugTypes(
  cdm,
  drugRecordsTable = "ingredient_drug_records",
  byConcept = TRUE,
  sampleSize = 10000
)
```

**Arguments**

cdm	CDMConnector reference object
drugRecordsTable	a modified version of the drug exposure table, default "ingredient_drug_records"
byConcept	by individual drug Concept
sampleSize	the sample size given in execute checks

**Value**

a table with the drug exposure record types

---

getDuration	<i>Compute the difference in days between 2 variables in a database table.</i>
-------------	--

---

**Description**

Compute the difference in days between 2 variables in a database table.

**Usage**

```
getDuration(  
  cdm,  
  tableName = "drug_exposure",  
  startDateCol = "drug_exposure_start_date",  
  endDateCol = "drug_exposure_end_date",  
  colName = "duration"  
)
```

**Arguments**

cdm	CDMConnector reference object
tableName	the table name
startDateCol	the start date column name
endDateCol	the end date column name
colName	the result column name

**Value**

the table with as new column the duration

---

ingredientDescendantsInDb	<i>Get the descendants for the given ingredients</i>
---------------------------	--

---

**Description**

Get the descendants for the given ingredients

**Usage**

```
ingredientDescendantsInDb(  
  cdm,  
  ingredient,  
  drugRecordsTable = "drug_exposure",  
  tablePrefix = NULL,  
  verbose = FALSE  
)
```

**Arguments**

cdm	CDMConnector reference object
ingredient	ingredient concept id for ingredient of interest
drugRecordsTable	table name of the drug exposure records, default "drug_exposure"
tablePrefix	The stem for the permanent tables that will be created when running the diagnostics. Permanent tables will be created using this prefix, and any existing tables that start with this will be at risk of being dropped or overwritten. If NULL, temporary tables will be used throughout.
verbose	if verbose set to TRUE, the function will output extra messages

**Value**

temp table with concepts used

---

mockDrugExposure	<i>Mock Drug exposure tables for ingredients of interest</i>
------------------	--

---

**Description**

Mock Drug exposure tables for ingredients of interest

**Usage**

```
mockDrugExposure(
  drug_exposure = NULL,
  concept_ancestor = NULL,
  concept_relationship = NULL,
  concept = NULL,
  drug_strength = NULL,
  ingredient_drug_records = NULL,
  drug_exposure_size = 100,
  patient_size = 50,
  person = NULL,
  observation_period = NULL,
  amount_val = c(NA, 100, 200, 300),
  den_val = c(1, 10, 100),
  amount_unit = c(8587, 8576, 9655),
  num_unit = c(8587, 8576, 9655),
  denom_unit = c(8587, 8576, 8505),
  num_val = c(1, 2, 3),
  seed = 1
)
```



**Arguments**

drug_exposure	drug exposure table
concept_ancestor	concept_ancestor table
concept_relationship	concept_relationship table
concept	concept table
drug_strength	drug strength table
ingredient_drug_records	modified drug exposure table having drug name
drug_exposure_size	the sample size of the drug exposure table
patient_size	the number of unique patients in the drug exposure table
person	person table
observation_period	observation_period table
amount_val	vector of possible numeric amount value for the drug in the drug strength table
den_val	vector of possible numeric denominator value for the drug in drug strength table
amount_unit	vector of possible amount unit type drug strength table representing milligram, milliliter and microgram
num_unit	vector of possible numerator unit type drug strength table representing milligram, milliliter and microgram
denom_unit	vector of possible numerator unit type drug strength table representing milligram, milliliter and hour
num_val	vector of possible numeric numerator denominator value drug strength table
seed	seed to make results reproducible

**Value**

CDMConnector CDM reference object to duckdb database with mock data include concept\_ancestor, concept, drug\_strength, drug\_exposure tables

---

obscureCounts	<i>Obscure the small number of counts</i>
---------------	---

---

**Description**

Obscure the small number of counts

**Usage**

```
obscureCounts(table, tableName, minCellCount = 5, substitute = NA)
```

**Arguments**

table	the table as a tibble
tableName	the table name
minCellCount	the minimum number of counts that will be displayed. If NULL all results will be reported.
substitute	the substitute value if values will be obscured

**Value**

the input table with results obscured if minCellCount applies

---

`printDurationAndMessage`

*Print duration from start to now and print it as well as new status message*

---

**Description**

Print duration from start to now and print it as well as new status message

**Usage**

```
printDurationAndMessage(message, start)
```

**Arguments**

message	the message
start	the start time

**Value**

the current time

---

summariseChecks	<i>Create a summary about the diagnostics results</i>
-----------------	---

---

**Description**

Create a summary about the diagnostics results

**Usage**

```
summariseChecks(resultList)
```

**Arguments**

resultList      a list with the diagnostics results

**Value**

a table containing the diagnostics summary

---

summariseDrugExposureDuration	<i>Summarise drug exposure record durations</i>
-------------------------------	---

---

**Description**

Summarise drug exposure record durations

**Usage**

```
summariseDrugExposureDuration(
  cdm,
  drugRecordsTable = "ingredient_drug_records",
  byConcept = TRUE,
  sampleSize = 10000
)
```

**Arguments**

cdm	CDMConnector reference object
drugRecordsTable	a modified version of the drug exposure table, default "ingredient_drug_records"
byConcept	by individual drug Concept
sampleSize	the sample size given in execute checks

**Value**

a table with the drug exposure record durations

---

summariseQuantity	<i>Summarise the quantity column of the drug_exposure table</i>
-------------------	---

---

**Description**

Summarise the quantity column of the drug\_exposure table

**Usage**

```
summariseQuantity(
  cdm,
  drugRecordsTable = "ingredient_drug_records",
  byConcept = TRUE,
  sampleSize = sampleSize
)
```

**Arguments**

cdm	CDMConnector reference object
drugRecordsTable	a modified version of the drug exposure table, default "ingredient_drug_records"
byConcept	whether to get result by drug concept
sampleSize	the sample size given in execute checks

**Value**

a table with the summarized quantity result

---

writeResultToDisk	<i>Write diagnostics results to a zip file on disk in given output folder.</i>
-------------------	--

---

**Description**

Write diagnostics results to a zip file on disk in given output folder.

**Usage**

```
writeResultToDisk(resultList, databaseId, outputFolder, filename = NULL)
```

**Arguments**

resultList	named list with results
databaseId	database identifier
outputFolder	folder to write to
filename	output filename, if NULL it will be equal to databaseId

**Value**

No return value, called for side effects

**Examples**

```
## Not run:  
resultList <- list("mtcars" = mtcars)  
result <- writeResultToDisk(  
  resultList = resultList,  
  databaseId = "mtcars",  
  outputFolder = here::here())  
  
## End(Not run)
```

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