

# Package ‘sgapi’

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**Title** Aid Querying 'nomis' and 'Office for National Statistics Open Geography' APIs

**Version** 1.1.2

**Description** Facilitates extraction of geospatial data from the 'Office for National Statistics Open Geography' and 'nomis' Application Programming Interfaces (APIs). Simplifies process of querying 'nomis' datasets <<https://www.nomisweb.co.uk/>> and extracting desired datasets in dataframe format. Extracts area shapefiles at chosen resolution from 'Office for National Statistics Open Geography' <<https://geoportal.statistics.gov.uk/>>.

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<https://github.com/Defra-Data-Science-Centre-of-Excellence/sgapi>

**BugReports**

<https://github.com/Defra-Data-Science-Centre-of-Excellence/sgApi/issues>

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**Author** Michael Stocks [aut, cre],  
Andrew Christy [aut],  
James Macpherson [aut],  
Hadyn Jenkins [aut],  
Crown Copyright (Department for Environment Food and Rural Affairs)  
[cph]

**Maintainer** Michael Stocks <[sgapi.orchub@gmail.com](mailto:sgapi.orchub@gmail.com)>

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---

|                 |  |
|-----------------|--|
| assert_function | <i>Escape Function in Case of Errors</i> |
|-----------------|--|

---

### Description

Evaluate condition and return error message if condition not satisfied.

### Usage

```
assert_function(condition, msg)
```

### Arguments

|           |   |
|-----------|---|
| condition | a logical expression (e.g. is.null(test_variable))      |
| msg       | the error message returned if the condition is not met. |

### Value

No return value, called for side effects.

**Examples**

```
assert_function(1==2,"Incorrect inequality")
```

---

```
availableBoundaries.rda
```

*List of available ONS boundaries*

---

**Description**

A list of the available boundary layers that the Office for National Statistics (ONS) has for ArcGIS queries

**Usage**

```
availableBoundaries
```

**Format**

A list of with 3348 rows and 1 variable:

**boundary** name of boundary table within 'ONS Open geography'

**Source**

```
availableBoundaries.rda
```

---

```
build_constituency_query_string
```

*Build constituency section of get\_boundary\_areaname query string*

---

**Description**

Create correctly formatted 'where' part of url query string used by get\_boundary\_areaname to fetch constituency boundaries

**Usage**

```
build_constituency_query_string(constituency_list, ...)
```

**Arguments**

```
constituency_list
```

Vector of constituency names

```
...
```

Additional strings to be added to the query string

**Value**

A string formatted for 'where' portion of url for querying Open Geography portal

**Examples**

```
build_constituency_query_string("Westminster", "LAD22NM", "3D")
"%20(%20'LAD22NM%20%3D%20'Westminster')%20"
```

```
build_constituency_query_string(c("Westminster", "Tower Hamlets"), "LAD22NM", "3D")
"%20(%20'LAD22NM%20%3D%20'Westminster'%20OR%20LAD22NM%20%3D%20'Tower%20Hamlets')%20"
```

---

build\_url\_query\_string

*Build URL Query String*

---

**Description**

Takes named arguments (...) and creates a URL query string starting with 'prefix' with each named pair of arguments separated with 'sep' and each item within a value that is a vector separated by 'value\_sep'.

Each value part of the named arguments must be coercible to character. For example, list(key1 = "value1", key2 = 42, key3 = c(1, 2, 4)) would be acceptable as it can all be coerced to characters

**Usage**

```
build_url_query_string(prefix = "?", sep = "&", value_sep = ",", ...)
```

**Arguments**

|           |  |
|-----------|--|
| prefix    | Prefix to returned URL. Defaults to "?".   |
| sep       | . String separating used to separate in the URL output each named argument in (...). Defaults to "&".    |
| value_sep | String separating each item in value if the value part of a named argument is a vector. Defaults to ",". |
| ...       | Any number of named argument pairs where the value must be coercible to character                        |

**Value**

A string containing the named arguments parsed into the URL query string format

## Examples

```
build_url_query_string()
""
build_url_query_string(field1 = "option1")
"?field1=option1"
build_url_query_string(field1 = "option1", field2 = 42, field3 = c(1, 2, 3))
"?field1=option1&field2=42&field3=1,2,3"
build_url_query_string(prefix = "/query?", sep = "|", value_sep = ":",
                        field1 = 1, field2 = c(7, 8, 9))
"/query?field1=1|field2=7:8:9"
```

---

get\_available\_scales *Available Boundary Scales for 'nomis' Table*

---

## Description

Retrieve available spatial scales for a given 'nomis' table id. This is useful as each table only has data at a specific set of scales, e.g. many census tables are available at MSOA and LSOA resolutions but not at Regional level.

## Usage

```
get_available_scales(id, base_url = "https://www.nomisweb.co.uk/api/v01")
```

## Arguments

|          |   |
|----------|---|
| id       | A valid 'nomis' table id given as a string. |
| base_url | Nomis API base url                          |

## Value

A tidy dataframe listing the geographical scales available for the 'nomis' table selected.

## Examples

```
get_available_scales(id="NM_1003_1")
```

---

|                |   |
|----------------|---|
| get_boundaries | <i>Get Boundaries Using Geospatial Filter</i> |
|----------------|---|

---

### Description

Retrieve boundaries from the Office for National Statistics (ONS) 'ONS Geography Portal' given a valid boundary name and layer name. If the submitted geometry is outwith the ONS Boundary, e.g. the geometry is in France, the function will return an empty shape file.

### Usage

```
get_boundaries(boundary, geometry_filter = NULL,
base_url = "https://services1.arcgis.com/ESMARspQHw9BZ9/arcgis/rest/services")
```

### Arguments

|                 |  |
|-----------------|--|
| boundary        | A valid ONS boundary name given as a string.   |
| geometry_filter | geospatial shape or point (using latitude and longitude). Currently limited to a rectangular box or dropped pin. |
| base_url        | Open Geography Portal base url   |

### Value

An sf object for all constituencies in the geospatial area submitted through the geometry\_filter, at the chosen ONS Boundary.

### Examples

```
## Not run:
get_boundaries(boundary="MSOA_Dec_2011_Boundaries_Generalised_Clippped_BGC_EW_V3_2022",
geometry_filter="-1.282825,52.354169,0.206626,52.7106")

## End(Not run)
```

---

|                         |  |
|-------------------------|--|
| get_boundaries_areaname | <i>Get Boundaries Using Area Names</i> |
|-------------------------|--|

---

### Description

Extract a geojson shapefile of the chosen areas at the user-selected resolution. List of all boundaries can be found here: <https://geoportal.statistics.gov.uk/search?q=Boundary&sort=Date%20Created%7Ccreated%7Cdesc>

**Usage**

```
get_boundaries_areaname(boundary, col_name_var, chosen_constituency_list,
base_url = "https://services1.arcgis.com/ESMARspQHm9BZ9/arcgis/rest/services")
```

**Arguments**

|                          |   |
|--------------------------|---|
| boundary                 | The resolution of constituencies, e.g. Census Output Areas or Westminster Constituencies. Available boundaries can be found here: <a href="https://geoportal.statistics.gov.uk/">https://geoportal.statistics.gov.uk/</a> |
| col_name_var             | The name of the datafield where the constituency name is held, e.g. PCON22NM for 2022 Parliamentary Constituencies.   |
| chosen_constituency_list | List of chosen constituencies.  |
| base_url                 | Open geography portal base url  |

**Value**

An sf object of the constituencies submitted to the function. If there are no constituencies, return is NULL.

**Examples**

```
get_boundaries_areaname(boundary="Local_Authority_Districts_December_2022_UK_BGC_V2",
col_name_var="LAD22NM",chosen_constituency_list=c("Westminster","Tower Hamlets","County Durham"))
```

---

get\_keyword\_table\_id *Keyword Search of 'nomis'*

---

**Description**

Function to return dataframe of all 'nomis' tables, and their corresponding codes and descriptions, which have the chosen keyword.

**Usage**

```
get_keyword_table_id(
  usr_keyword,
  base_url = "https://www.nomisweb.co.uk/api/v01"
)
```

**Arguments**

|             |  |
|-------------|--|
| usr_keyword | Keyword to search 'nomis' tables for, e.g. "religion", "employment", "housing" |
| base_url    | nomis url to query   |

**Value**

A tidy dataframe of all nomis tables and their ids, which contain the chosen keyword.

**Examples**

```
get_keyword_table_id(usr_keyword="passports")
```

---

|                            |                     |
|----------------------------|---------------------|
| <code>get_ons_table</code> | <i>Get ONS data</i> |
|----------------------------|---------------------|

---

**Description**

Retrieve data from the Office of National Statistics (ONS) via the Nomis API for a given dataset.

**Usage**

```
get_ons_table(
  id,
  base_url = "https://www.nomisweb.co.uk/api/v01",
  csv_parser_fnc = utils::read.csv,
  ...
)
```

**Arguments**

|                             |  |
|-----------------------------|--|
| <code>id</code>             | a table ID recognised by 'nomis' (e.g. "NM_1_1")   |
| <code>base_url</code>       | Nomis base url to query. Default: "https://www.nomisweb.co.uk/api/v01"   |
| <code>csv_parser_fnc</code> | Function for parsing the csv file from Nomis API url. Default: <code>read.csv</code>   |
| <code>...</code>            | Additional parameters used to filter and aggregate the data retrieved from ONS. These are passed to <code>build_url_query_string</code> to build everything in the url after "?". See "https://www.nomisweb.co.uk/api/v01/help" for information on the options available |

**Value**

A dataframe containing the data downloaded from ONS' Nomis API

**Examples**

```
# Pull all data from the "Jobseeker's Allowance" dataset
## Not run: get_ons_table("nm_1_1")
# Filter "Jobseeker's Allowance" dataset and select columns to output ('select')
get_ons_table("nm_1_1", geography = "TYPE480", time = "latest", measures = 20100, item = 1,
  select = c("geography_name", "sex_name", "obs_value"))

# Aggregate statistics using 'rows' and 'cols'
get_ons_table("nm_1_1",
```

```
geography = "TYPE480", time = "latest", measures = 20100, item = 1,
select = c("geography_name", "sex_name", "obs_value"),
rows = c("geography_name"), cols = c("sex_name"))
```

---

get\_overview

*Table Overview*


---

### Description

Retrieve dataset overview for a valid 'nomis' table id. Returned object includes description of the dataset, last update date, contact for the data. It also extracts all of the available instances of the available table dimensions, which can then be used to filter the dataset 'nomis' table.

### Usage

```
get_overview(id, base_url = "https://www.nomisweb.co.uk/api/v01")
```

### Arguments

|          |                         |
|----------|-------------------------|
| id       | A valid 'nomis' id.     |
| base_url | Base nomis url to query |

### Value

An object with overview information of chosen data set. Object has the structure of the extracted JSON object.

### Examples

```
get_overview(id="NM_1_1")
```

---

get\_structure

*Extract 'nomis' Table Data for Chosen Dimension*


---

### Description

Retrieve dataset for a valid 'nomis' table id and dimension. This extracts all of the available instances of the chosen dimension, which can then be used to filter the 'nomis' table.

### Usage

```
get_structure(id, dim, base_url = "https://www.nomisweb.co.uk/api/v01")
```

**Arguments**

|          |   |
|----------|---|
| id       | A valid 'nomis' id.                           |
| dim      | The name of the g which dimension is queried. |
| base_url | Base nomis url to query                       |

**Value**

An object with JSON structure for the chosen dimension of the selected 'nomis' table.

**Examples**

```
get_structure(id="NM_187_1",dim="industry")
```

---

get\_table

*Get 'nomis' Table*

---

**Description**

Retrieve a 'nomis' table, containing the columns of interest, using a given table ID. Option to apply filters to the query, and to circumnavigate the limit on number of rows returned using your 'nomis' uid.

**Usage**

```
get_table(
  id,
  options,
  selection = NULL,
  uid = NULL,
  base_url = "https://www.nomisweb.co.uk/api/v01"
)
```

**Arguments**

|           |  |
|-----------|--|
| id        | a table ID recognised by 'nomis' (e.g. "NM_1_1")   |
| options   | a list of paramaters to pass to the API query.   |
| selection | a vector of column names to return. NULL returns all. Defaults to NULL.  |
| uid       | Unique 'nomis' identifier to enable larger 'nomis' queries - <a href="https://www.nomisweb.co.uk/">https://www.nomisweb.co.uk/</a> . Defaults to NULL. |
| base_url  | Nomis base url to query  |

**Value**

A tidy dataframe of selected 'nomis' table with the selected parameters and user filters applied.

### Examples

```
get_table(id="NM_1_1", options = list("geography" = "TYPE480", "time" = "latest"))
get_table(id="NM_1002_1", options = list("geography" = "TYPE265", "time" = "latest"),
selection = "GEOGRAPHY_NAME,C_AGE_NAME,OBS_VALUE",uid=NULL)
```

---

get\_table\_dimensions    *Table Dimensions*

---

### Description

Extract dimensions available for a given 'nomis' table ID. e.g. the dimensions of the table 'RM011 - Country of birth by age ' are age, country and geography; this function will return all of the available age, country and geography filters available on the table.

### Usage

```
get_table_dimensions(id, base_url = "https://www.nomisweb.co.uk/api/v01")
```

### Arguments

|          |  |
|----------|--|
| id       | A table ID recognised by 'nomis' (e.g "NM_1_1"). |
| base_url | Nomis API base url                               |

### Value

A tidy dataframe of the dimensions, and available filtering values, of your chosen 'nomis' table.

### Examples

```
get_table_dimensions(id="NM_1240_1")
```

---

get\_table\_id            *Get 'nomis' Table IDs*

---

### Description

Extract unique table ids for 'nomis' tables containing given name in their title, these unique table ids can be used to rapidly query census data in other functions e.g. 'get\_overview("NM\_102\_1")'

### Usage

```
get_table_id(name, base_url = "https://www.nomisweb.co.uk/api/v01")
```

**Arguments**

|          |   |
|----------|---|
| name     | A string to search for within 'nomis' table titles. |
| base_url | Nomis API base url                                  |

**Value**

A dataframe of 'nomis' table codes and names, as strings, for all 'nomis' tables containing the selected 'name' in their title.

**Examples**

```
get_table_id(name="employment")
```

---

get\_table\_info\_brief *Key 'nomis' Table Information*

---

**Description**

Retrieve summary information about a given 'nomis' dataset. This is useful as it provides the description of the dataset and any caveats. It also returns information about the current status of the data, and when it was last updated.

**Usage**

```
get_table_info_brief(id, base_url = "https://www.nomisweb.co.uk/api/v01")
```

**Arguments**

|          |   |
|----------|---|
| id       | A valid 'nomis' table id given as a string, e.g. NM_46_1. |
| base_url | Base nomis url to query                                   |

**Value**

A json file containing the DatasetInfo, DatasetMetadata, Dimensions (variables), Dataset Contact, Units from the target 'nomis' table.

**Examples**

```
get_table_info_brief(id="NM_1_1")
```

---

*get\_table\_link\_lookup Lookup Between Boundary Scales*

---

**Description**

Extract a lookup table between two boundary scales from 'ONS Open Geography' portal, e.g. get a lookup between Regions and Parliamentary constituencies.

**Usage**

```
get_table_link_lookup(  
  lookup_table,  
  col_name_1,  
  col_name_2,  
  col_name_3,  
  col_name_4,  
  base_url = "https://services1.arcgis.com/ESMARspQHmW9BZ9/arcgis/rest/services"  
)
```

**Arguments**

|              |  |
|--------------|--|
| lookup_table | A valid ONS lookup table   |
| col_name_1   | Field in ONS table containing the constituency code of the smaller scale resolution. |
| col_name_2   | Field in ONS table containing the constituency code of the larger scale resolution.  |
| col_name_3   | Field in ONS table containing the constituency name of the smaller scale resolution. |
| col_name_4   | Field in ONS table containing the constituency name of the larger scale resolution.  |
| base_url     | Open geography portal base url   |

**Value**

A tidy dataframe, providing a lookup between two chosen boundary resolutions.

**Examples**

```
## Not run:  
get_table_link_lookup(lookup_table="LAD22_CTY22_EN_LU", col_name_1="LAD22CD",  
  col_name_2="CTY22CD", col_name_3="LAD22NM", col_name_4="CTY22NM")  
  
## End(Not run)
```

---

|                   |                                  |
|-------------------|----------------------------------|
| list_data_sources | <i>List 'nomis' Data Sources</i> |
|-------------------|----------------------------------|

---

**Description**

Return a list of the data sources available on 'nomis'.

Returns a list including the name, id and description of each data source available on 'nomis'. More information can be found here: <https://www.nomisweb.co.uk/api/v01/help>

**Usage**

```
list_data_sources(base_url = "https://www.nomisweb.co.uk/api/v01")
```

**Arguments**

base\_url      Base nomis url to query

**Value**

A tidy dataframe of all available data sources accessible through the 'nomis' API system.

**Examples**

```
list_data_sources()
```

---

|             |                                 |
|-------------|---------------------------------|
| list_tables | <i>Available 'nomis' Tables</i> |
|-------------|---------------------------------|

---

**Description**

List all available datasets on 'nomis'. User can then use the items on this list to query 'nomis' data.

**Usage**

```
list_tables(base_url = "https://www.nomisweb.co.uk/api/v01")
```

**Arguments**

base\_url      Url of the API from which the available tables are listed.

**Value**

A tidy dataframe containing the name and ID of each table available on 'nomis'.

---

|            |  |
|------------|--|
| lookup.rda | <i>Lookup to match Office for National Statistics (ONS) and 'nomis' boundary names</i> |
|------------|--|

---

**Description**

Lookup table providing ONS and 'nomis' references for a given ONS boundary layer. The variables are as follows:

**Usage**

```
lookup
```

**Format**

A data frame with 30 rows and 4 variables:

**resolution** boundary layer, written in interpretable manner

**ons** corresponding boundary layer in the format that the 'ONS Open Geography' API will interpret

**nomis** corresponding boundary layer in the format that the 'nomis' API will interpret

**Names\_and\_Codes** lookup file containing the constituency names and codes of the boundary layer

**Source**

```
lookup.rda
```

---

|                 |                                     |
|-----------------|-------------------------------------|
| nomisTables.rda | <i>#' List of tables on 'nomis'</i> |
|-----------------|-------------------------------------|

---

**Description**

A dataset containing the available tables, codes and sources of data available on 'nomis'. The variables are as follows:

**Usage**

```
nomisTables
```

**Format**

A data frame with 1605 rows and 3 variables:

**name** name of dataset

**id** code corresponding to dataset

**sourceName** source of dataset

**Source**

nomisTables.rda

---

scalesForEachDataset.rda

*#' List of tables available at each ONS resolution*

---

**Description**

A dataset containing the available tables on 'nomis', and the boundary layers at which this data is held, e.g. demographic information may only be held in the Census output areas and not NHS regions. The variables are as follows:

**Usage**

scalesForEachDataset

**Format**

A data frame with 22564 rows and 3 variables:

**name** name of boundary layer

**value** type of data

**table** nomis code for the table

**Source**

scalesForEachDataset.rda

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