

# Package ‘hospitals’

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**Type** Package

**Title** Portuguese 'NHS' Hospitals

**Version** 0.1.0

**Description** A data set of the Portuguese 'NHS' hospitals.

**License** CC0

**URL** <https://github.com/nhs-pt/hospitals>

**BugReports** <https://github.com/nhs-pt/hospitals/issues>

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## Contents

get_hospital_attribute . . . . .	2
hospitals . . . . .	3
normalise . . . . .	5

<b>Index</b>	<b>8</b>
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get\_hospital\_attribute

*Get hospital attribute*

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## Description

get\_hospital\_attribute retrieves one of the variables of [hospitals](#) as indicated in x. Hospitals in x can be specified by the: (i) hospital identifier, (ii) acronym, or the (iii) shortened or (iv) full version of the hospital name.

## Usage

```
get_hospital_attribute(x, key = "hospital_id", value = "hospital_short_name")
```

## Arguments

x	A character vector of values that refer to hospitals, can be either the hospital identifier (e.g. "h0003"), its acronym (e.g. "HB"), the shortened name ("H de Braga") or the full name ("Hospital de Braga, EPE"). Indicate how x should be interpreted with the parameter key.
key	A string indicating the type of values in x: "hospital_id", "hospital_acronym", "hospital_short_name" or "hospital_full_name".
value	A string indicating the hospital attribute to be returned, can be any of the columns of <a href="#">hospitals</a> .

## Value

A character vector of hospital attributes.

## Examples

```
# Get the short name of a hospital
# (same as get_hospital_attribute('h0001', value = 'hospital_short_name'))
get_hospital_attribute('h0001')

# Or get instead the full name
get_hospital_attribute('h0001', value = 'hospital_full_name')

# Map the hospital short name to its full name
get_hospital_attribute('IPO de Lisboa', key = 'hospital_short_name', value = 'hospital_full_name')
```

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hospitals

*Portuguese NHS hospitals*

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## Description

A dataset of the Portuguese National Health Service hospitals.

## Usage

hospitals

## Format

A data frame with 16 variables:

`hospital_id` A surrogate identifier created by this R package to identify unambiguously each hospital institution.

`hospital_acronym` The acronym or initialism of the hospital name.

`hospital_legal_status` Legal entity status: either an administrative public sector (SPA) entity, a corporate public entity (EPE) or a public-private partnership (PPP) entity. The legal status of SPA and EPE entities can be found in [Decree-law 18/2017](#). For information about the legal status of the PPP entities see [Decree-law 23/2020](#). The Portuguese government may also establish contracts with hospitals owned by social enterprises, namely Private Institutions of Social Solidarity (IPSS). In this case, these hospitals become effectively part of the National Health Service. There are three types of contracts that can be established with IPSS which are regulated by the [Decree-law 138/2013](#): Management Agreement (IPSS-MA), Cooperative Agreement (IPSS-CA) and Convention (IPSS-CN).

`hospital_integration` The integration level of the hospital institution: a single hospital unit ('H'); *Centro Hospitalar* ('CH'), comprising two or more individual Hospital units (a case of [horizontal integration](#)); and *Unidade Local de Saúde* ('ULS'), comprising both Hospital entities and primary care health centres (a case of [vertical integration](#)).

`hospital_group` One of the groups defined by [Ordinance 82/2014](#): I, II, III, IV-a, IV-b or IV-c. This classification is based on the hospital catchment area and the scope of medical specialities provided. Broadly speaking, group I includes local hospitals, group II corresponds to regional hospitals, and group III to central hospitals. Group IV corresponds to specialised hospitals: IV-a, oncology institutes; IV-b, physical medicine and rehabilitation hospitals; and IV-c, psychiatry and mental health hospitals.

`hospital_short_name` An abbreviated version of the hospital name.

`hospital_full_name` The name of the hospital.

`hospital_region_full_name` The name of the Portuguese health region.

`hospital_region_short_name` A shortened version of `hospital_region_full_name`.

`hospital_vatin` VAT identification number (VATIN). In Portuguese, *Número de Identificação de Pessoa Colectiva* (NIPC).

`hospital_latitude` Latitude of the location of the hospital entity expressed in decimal degrees.

- `hospital_longitude` Longitude of the location of the hospital entity expressed in decimal degrees.
- `hospital_region_colour` Colour associated with the region. These colours are assigned by this package and are provided as a convenience colour palette for plotting in R.
- `hospital_bh_group` One of the groups defined by the project Benchmarking of Hospitals. Source: [BH | Grupos e Instituições](#).
- `hospital_bh_group_colour` Colour associated with the `bh_group`. These colours are assigned by this package and are provided as a convenience colour palette for plotting in R.
- `hospital_regex` A regular expression that can be used to identify hospitals from their names, even when the names are not exactly as in `hospital_full_name`.

## Details

The concept of *hospital* here adopted is that of a legal entity providing hospital services. Depending on the organisational structure of the entity, it may be a single hospital unit (H), several hospital units that have been merged into one Hospital Centre (CH), or a merge of hospital units and health centres into the so called *Unidades Locais de Saúde (ULS)*; the column `hospital_integration` indicates which case is which.

## Source

The set of hospitals included in this dataset was created by manual inspection of the hospital institutions referred in <https://www.sns.gov.pt/institucional/entidades-de-saude/>, namely those under the sections: *Serviço Nacional de Saúde—Setor Público Empresarial*, *Serviço Nacional de Saúde—Setor Público Administrativo*, *Hospitais em parceria público-privada (PPP)* and *Hospitais geridos pelas Misericórdias*.

Here are the sources per variable (column) in the dataset:

`hospital_id` Own work.

`hospital_acronym` Own work.

`hospital_legal_status` Obtained from <https://www.sns.gov.pt/institucional/entidades-de-saude/> as the hospitals were grouped according to its legal status. In the case of the partnerships with IPSS, the information on the precise type of contract was obtained from inspection of the contracts themselves. In all cases they are Cooperative Agreements (IPSS-CA):

**Hospital Luciano de Castro, Anadia** [data-raw/source/Acordo\\_Cooperacao\\_Hospital\\_Jose\\_Luciano\\_Castro\\_-Anadia1.pdf](#)

**Hospital São José, Fafe** [data-raw/source/Acordo\\_Coop\\_Hosp\\_Sao\\_Jose\\_Fafe.pdf](#)

**Hospital de São Paulo, Serpa** [data-raw/source/Acordo\\_Cooperacao\\_-Hospital\\_Sao\\_Paulo\\_Serpa.pdf](#)

`hospital_integration` The classification in Hospital unit (H), Hospital Centre (CH) or Unidade Local de Saúde (ULS) could be easily inferred from the name of the hospitals. Hospital Centres always start with *Centro Hospitalar* (CH), and ULS hospitals always start with *Unidade Local de Saúde* (ULS). The remaining hospitals are therefore single Hospital (H) units.

`hospital_group` **Hospitals mentioned in Ordinance 82/2014** For the majority of the hospitals this grouping was obtained from the ordinance where these are first defined, i.e., the table annexed to Ordinance 82/2014.

**Instituto de Oftalmologia Dr. Gama Pinto** The hospital *Instituto de Oftalmologia Dr. Gama Pinto* was not assigned to any group in the Ordinance 82/2014. But given that this hospital is exclusively specialised in ophthalmology, we have decided to assign it generically to group IV (for specialised hospitals), following the criteria given in Ordinance 82/2014.

**Hospital Dr. Francisco Zagalo, Ovar** The hospital *Hospital Dr. Francisco Zagalo, Ovar* was not assigned to any group in the Ordinance 82/2014. It was included in group I however in a work by Luís Pereira, which we followed, see Table 15 in the Appendix 1, page 71 of [data-raw/source/Pereira.Unpublished.2019.pdf](#).

**Hospital Luciano de Castro, Anadia** The hospital *Hospital Luciano de Castro, Anadia* was not assigned to any group in the Ordinance 82/2014. It was included in group I however in a work by Luís Pereira, which we followed, see Table 15 in the Appendix 1, page 71 of [data-raw/source/Pereira.Unpublished.2019.pdf](#).

hospital\_short\_name Own work.

hospital\_full\_name Obtained from <https://www.sns.gov.pt/institucional/entidades-de-saude/>.

hospital\_region\_full\_name Obtained from [Decree-law 11/93](#).

hospital\_region\_short\_name Own work.

hospital\_vatin From the search engine <https://codigopostal.ciberforma.pt/> and from [data-raw/source/Infarmed\\_lista\\_hospitais.pdf](#).

hospital\_latitude **and** hospital\_longitude By searching each hospital in Google Maps and retrieving its coordinates.

hospital\_region\_colour Own work.

hospital\_bh\_group The ACSS groups defined in the project [Hospitals' Benchmarking](#) were collected from these sources:

**ACSS Hospitals' Benchmarking website** [ACSS BH | Grupos e Instituições](#)

*Relatório de Benchmarking | hospitais EPE e PPP* Page 7 of [data-raw/source/Lourenco.TechReport.2013.pdf](#)

*Termos de Referência para contratualização de cuidados de saúde no SNS para 2021* Page 25 of [data-raw/source/ACSS.TechReport.2020.pdf](#)

hospital\_bh\_group\_colour Own work.

hospital\_regex Own work.

## Examples

hospitals

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normalise

*Normalise hospital names*

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## Description

normalise tries to match provided hospital names to the Portuguese NHS hospitals, i.e. to those hospitals included in the data set [hospitals](#), thus allowing conversion to standard hospital names. By default, it returns the shortened version of the hospital name: column `hospital_short_name` in [hospitals](#). Use the return argument to return a different variable, see below for possible values.

## Usage

```
normalise(  
  nm,  
  return = c("hospital_short_name", "hospital_full_name", "hospital_id",  
            "hospital_acronym"),  
  unmatched_as_na = TRUE  
)  
  
normalize(  
  nm,  
  return = c("hospital_short_name", "hospital_full_name", "hospital_id",  
            "hospital_acronym"),  
  unmatched_as_na = TRUE  
)
```

## Arguments

<code>nm</code>	A character vector of hospital names.
<code>return</code>	A string indicating the hospital attribute to be returned: either <code>hospital_short_name</code> (default), <code>hospital_full_name</code> , <code>hospital_id</code> or <code>hospital_acronym</code> . These hospital variables are documented in <a href="#">hospitals</a> .
<code>unmatched_as_na</code>	A logical indicating whether unmatched hospital names are returned as NA (TRUE, the default) or as originally supplied in <code>nm</code> (FALSE).

## Details

The method behind `normalise` for matching hospital names is based on an heuristic that uses a minimal set of keywords to identify the hospital. This is implemented by using regular expressions. The regular expressions are provided in data set [hospitals](#), column `hospital_regex`. Moreover, the method is case insensitive and is pretty tolerant to variations in the name as long as one of the critical keywords is found in the name. Note however that the regular expressions have been designed such that matches are mutually exclusive. So the same hospital name will never match more than one hospital of the data set [hospitals](#).

`normalise` is aware of deprecated hospital names, and will map those old designations to the new hospital names, e.g., Hospital do Alto Ave is correctly mapped to Hospital da Senhora da Oliveira, Guimarães, EPE.

`normalise` is lenient with typos associated with accented characters, so, e.g., both expressions 'Hospital de São João' and 'Hospital de Sao Joao' will correctly match to the same hospital: CHU de São João.

## Value

A character vector.

**Examples**

```
# Match hospital with a single keyword
normalise('Matosinhos')

# The same, but return now the full name
normalise('Matosinhos', 'hospital_full_name')

# Get instead the hospital identifier
normalise('Matosinhos', 'hospital_id')

# Or even just the acronym (useful for labelling in plots)
normalise('Matosinhos', 'hospital_acronym')

# Find hospitals from their old names
# "Hospital do Alto Ave" is the old name for 'Hospital da Senhora da Oliveira, Guimarães, EPE'
normalise('Hospital do Alto Ave', 'hospital_full_name')

# `normalise()` is vectorised over `nm`
normalise(nm = c('medio tejo', 'oeste', 'guarda'))
```

# Index

\* **datasets**

hospitals, [3](#)

get\_hospital\_attribute, [2](#)

hospitals, [2](#), [3](#), [5](#), [6](#)

normalise, [5](#)

normalize (normalise), [5](#)