Medical practice variations

# Abdominal radiography - Including esophagus

Analysis of the distribution of medical practice in Belgium, in terms of volume and expenditure per patient and per insured (distribution, occurrence, trends by region, province and district), for the year **2024**

NIHDI – Healthcare Service – Directorate for Research, Development and Quality promotion

**Appropriate care unit**

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# 1. INTRODUCTION

The Appropriate Care Unit was set up within the NIHDI's Directorate for Research, Development and Quality under NIHDI's Administration Contract for 2016-2018[1]. Article 35 of this contract refers to 'the setting up of an Appropriate Care Unit, aiming specifically to promote an integrated approach to the rational use of resources'. The Appropriate Care Unit has been up and running since the second quarter of 2017.

The tasks of the Unit were set out formally in the '2016-2017 Healthcare monitoring Action plan', published by NIHDI on 18 July 2016[1]. This plan lists around thirty measures designed to make healthcare provision more efficient, by encouraging appropriate practice and tackling unnecessary or inappropriate care.

The plan states that one of the tasks of the Appropriate Care Unit is to analyse the 'appropriateness of care', in order to identify un-explained variations in consumption patterns, identified after standardisation. Such variations can potentially point to non-optimal use of resources.

'Variations in medical practice' documents report on the analyses carried out in this framework. Each report focuses on a particular topic.

In this document, we present the figures and graphs relating to analyses2 of practice in the area of Abdominal radiography - Including esophagus, and give the explanations necessary to understand these.

We have deliberately chosen not to attempt to interpret the figures, preferring to present the results to experts who are in a better position to do so. This document has nevertheless been made available to the public in order to provide objective, open input to discussions on this issue..

The data presented in this analysis reflect the coverage of healthcare costs by compulsory health insurance. However, this does not mean that all services are provided in accordance with regulations and/or guidelines.

[1] (National Institute for Health and Disability Insurance, 2016)

[2] Readers interested in the methodology used in these quantitative analyses should consult the document entitled 'Variations in practice – Methodology'.

## 2. KEY DATA SUMMARY

| | | TOTAL | Δ[1] |
|---|---|---|---|
| **PROVIDERS & PRESCRIBERS** | | | |
| **Main healthcare providers:** | *Radiology* | **98,33%** | |
| **Main prescribers:** | *General practitioners* | **18,17%** | |
| **USAGE RATE** | | | |
| **Number of services per year** | | **188.754** | |
| **Average occurrence per patient per day** (services) | | **1,02** | |
| **Average occurrence per patient per year** (days) | | **1,24** | |
| **Total average occurrence** | | **1,26** | |
| **Estimated number of patients** (per year) | | **149.727** | |
| **Standardised usage rate** (per 100 000 insured persons) | | **1.284** | |
| **Percentage of outpatient care** | | **64,38%** | |
| **Percentage One-day/(One-day + Inpatient)** | | **22,06%** | **δδδ** |
| **POPULATION** | | | |
| **% of the selected population compared to the total number of insured people** | | **100,00%** | |
| **Median age of patients** | | **62** years | **δ** |
| **Ratio of standardised usage rate women/men** (patients) | | **1,13** | |
| **Ratio of standardised usage rate preferential rate/general rate** (patients) | | **1,53** | |
| **TRENDS** | | | |
| **Trends**[2] (2014-2024) | | **-6,57% ***** | **δδδ** |
| **Trends** (2014-2022) | | **-7,52%** | |
| **Trends**[3] (2022-2024) | | **-2,69% ***** | |
| **DIRECT EXPENSES** | | | |
| **Annual expenditure** | | **7.256.824** € | |
| **Average annual expenditure per insured**[4] | | **0,62** € | |
| **Average annual expenditure per patient** | | **48,47** € | **δδδ** |

[1] **Δ Dispersion marker: comparison of the coefficient of variation (CV) of the indicator with the median (MED) of the CVs of all analyses for this indicator: δ if CV > MED + 10%, δδ if CV > MED + 20%, δδδ if CV > MED + 30%.**
**Exception: For median age, δ means CV > MED + 30%.**

[2] The test indicates whether the observed slope is statistically significantly different from 0%.

[3] The test indicates whether the break in trend between the two periods is statistically significant.

[4] Expenditure is based on the insured people selected

# 3. SPECIFIC METHOD OF ANALYSIS

## A. NIHDI nomenclature codes selected for analysis

The NIHDI nomenclature codes selected for the analysis are listed below :

| Outpatient | Inpatient | Rates | Expenses | Label | Creation | Deletion | Group N | Value |
|---|---|---|---|---|---|---|---|---|
| **450015** | **450026** | yes | yes | Radiographie de l'abdomen et/ou de la région pelvienne pour examen direct sans manipulation ni moyen de contraste, quel que soit le nombre de clichés (non cumulable avec les prestations n°s 450516 - 450520, 451010 - 451021, 455276 - 445280, effectuées le même jour) | 01-04-1985 | | N50 | N35 |
| **450516** | **450520** | yes | yes | Radiographie de l'abdomen et/ou de la région vésicale pour examen direct sans manipulation ni moyen de contraste, quel que soit le nombre de clichés (non cumulable avec les prestations n°s 450015 - 450026, 451010 - 451021 et 455276 - 455280 effectuées le même jour) | 01-04-1985 | | N50 | N35 |
| **451010** | **451021** | yes | yes | Radiographie de l'abdomen et/ou de la région vésiculaire pour examen direct, sans manipulation ni moyens de contraste, quel que soit le nombre de clichés (non cumulable avec les prestations n°s 450015 - 450026, 450516 - 450520,451312 - 451323, 451356 - 451360, 451393 - 451404, 451430 - 451441, 451474 - 451485, 451511 - 451522, 451710 - 451721, 451754 - 451765, 451813 - 451824, 451894 - 451905 et 455276 - 455280 effectuées le même jour) | 01-04-1985 | | N50 | N45 |
| **451135** | **451146** | yes | yes | Radiographie de l'oesophage avec examen radioscopique avec amplificateur de brillance et chaîne de télévision, minimum 6 clichés | 01-04-1985 | | N50 | N50 |
| **451312** | **451323** | yes | yes | Radiographie du transit de la région iléocoecale avec examen radioscopique avec amplificateur de brillance et chaîne de télévision, minimum 4 clichés | 01-04-1985 | | N50 | N95 |
| **451356** | **451360** | yes | yes | Radiographie du transit complet du grêle, avec examen radioscopique avec amplificateur de brillance et chaîne de télévision, minimum deux clichés | 01-04-1985 | | N50 | N135 |
| **451393** | **451404** | yes | yes | Radiographie de l'oesophage (minimum 6 clichés), et de l'estomac (minimum 2 clichés), avec examen radioscopique avec amplificateur de brillance et chaîne de télévision | 01-04-1985 | | N50 | N105 |
| **451430** | **451441** | yes | yes | Radiographie de l'oesophage (minimum 4 clichés), et de l'estomac et du duodénum en série (minimum 6 clichés), avec examen radioscopique avec amplificateur de brillance et chaîne de télévision | 01-04-1985 | | N50 | N165 |
| **451474** | **451485** | yes | yes | Radiographie de l'estomac et du duodénum en série (minimum 6 clichés), et du transit du grêle, y compris éventuellement la région iléocoecale et le côlon (minimum 6 clichés), avec examen radioscopique avec amplificateur de brillance et chaîne de télévision | 01-04-1985 | | N50 | N175 |
| **451511** | **451522** | yes | yes | Radiographie de l'oesophage (minimum 4 clichés) et de l'estomac et du duodénum en série (minimum 6 clichés) et du transit du grêle, y compris éventuellement la région iléocoecale et le côlon (minimum 6 clichés) avec examen radioscopique avec amplificateur de brillance et chaîne de télévision | 01-04-1985 | | N50 | N230 |

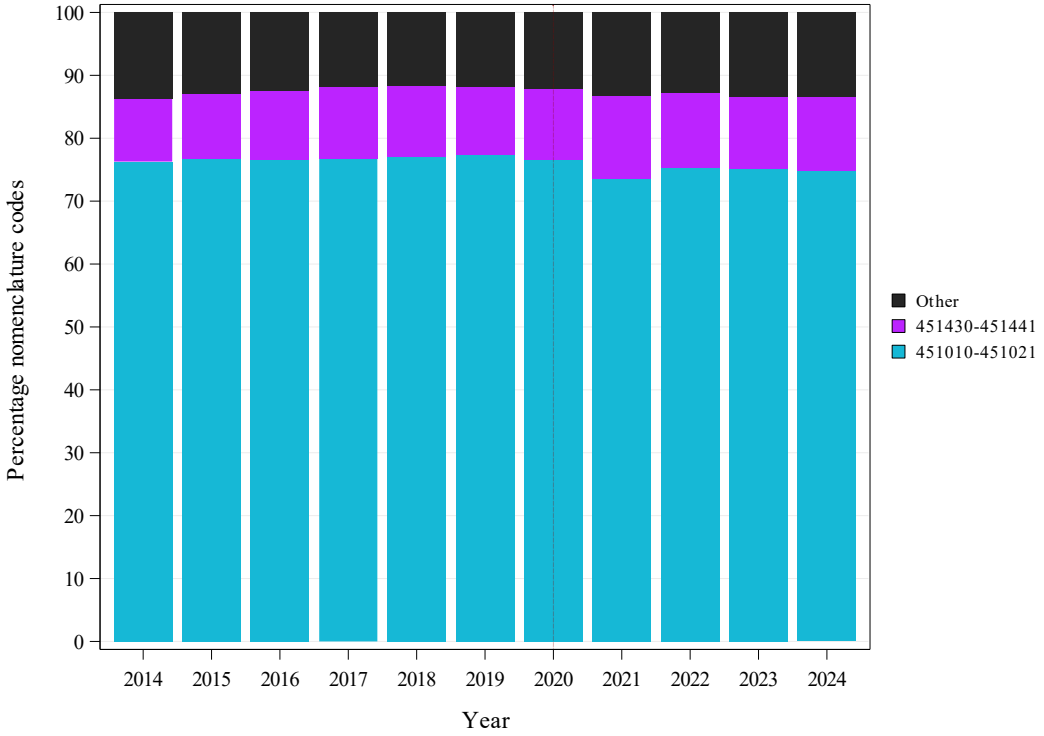
This table shows the NIHDI nomenclature codes selected for this analysis, stating whether or not they were included in the analyses of services and expenditure, and giving, for each one, a description, dates of creation and deletion, where appropriate, their N group (in the NIHDI nomenclature) and their value.

| Outpatient | Inpatient | Rates | Expenses | Label | Creation | Deletion | Group N | Value |
|---|---|---|---|---|---|---|---|---|
| **451710** | **451721** | yes | yes | Radiographie du côlon, y compris éventuellement la région iléocoecale, par lavement baryté après remplissage, évacuation et éventuellement insufflation, minimum 4 clichés avec examen radioscopique avec amplificateur de brillance et chaîne de télévision | 01-04-1985 | | N50 | N135 |
| **451754** | **451765** | yes | yes | Radiographie du côlon, y compris éventuellement la région iléocoecale, par lavement baryté après remplissage, évacuation et insufflation par la technique du double contraste, minimum 8 clichés avec examen radioscopique avec amplificateur de brillance et chaîne de télévision | 01-04-1985 | | N50 | N200 |
| **461510** | **461521** | yes | yes | Radiographie de l'abdomen et/ou de la région vésicale pour examen direct sans manipulation ni moyens de contraste quel que soit le nombre de clichés (non cumulable avec la prestation 466270-466281 effectuée le même jour) | 01-11-1994 | | N50 | N35 |
| **462431** | **462442** | yes | yes | Radiographie de l'oesophage (minimum 4 clichés), et de l'estomac et du duodénum.en série (minimum 6 clichés), avec examen radioscopique avec amplificateur de brillance et chaîne de télévision | 01-11-1994 | | N50 | N165 |
| **462512** | **462523** | yes | yes | Radiographie de l'oesophage (minimum 4 clichés) et de l'estomac et du duodénum en série (minimum 6 clichés) et du transit du grêle, y compris éventuellement la région iléocoecale et le côlon (minimum 6 clichés) avec examen radioscopique avec amplificateur de brillance et chaîne de télévision | 01-11-1994 | | N50 | N230 |
| **462711** | **462722** | yes | yes | Radiographie du côlon, y compris éventuellement la région iléocoecale, par lavement baryté après remplissage, évacuation et éventuellement insufflation, minimum 4 clichés avec examen radioscopique avec amplificateur de brillance et chaîne de télévision | 01-11-1994 | | N50 | N135 |
| **462755** | **462766** | yes | yes | Radiographie du côlon, y compris éventuellement la région iléocoecale, par lavement baryté après remplissage, évacuation et insufflation, par la technique du double contraste, minimum 8 clichés avec examen radioscopique avec amplificateur de brillance et chaîne de télévision | 01-11-1994 | | N50 | N200 |

## B. Past history of nomenclature codes

[No modification implemented during the period]

## C. Trends in the breakdown of nomenclature codes provided, by volume




| Combined codes | Label |
|---|---|
| **Other** | Other codes |
| **451430-451441** | Radiographie de l'oesophage (minimum 4 clichés), et de l'estomac et du duodénum en série (minimum 6 clichés), avec examen radioscopique avec amplificateur de brillance et chaîne de télévision |
| **451010-451021** | Radiographie de l'abdomen et/ou de la région vésiculaire pour examen direct, sans manipulation ni moyens de contraste, quel que soit le nombre de clichés (non cumulable avec les prestations n°s 450015 - 450026, 450516 - 450520,451312 - 451323, 451356 - 451360, 451393 - 451404, 451430 - 451441, 451474 - 451485, 451511 - 451522, 451710 - 451721, 451754 - 451765, 451813 - 451824, 451894 - 451905 et 455276 - 455280 effectuées le même jour) |

This graph is limited to the main nomenclature codes in terms of volume. All nomenclature codes used for the analysis are described on page 5.

Note : The year 2020 was highlighted by a vertical dashed line, in order to draw the attention on the impact of the COVID-19 crisis.

## D. Source of data and analysis period

The data used in the analyses have been taken from the following databases :

| | |
|---|---|
| **Document N** | For the utilisation rate and amount of expenses of persons insured and residing in Belgium, in 2014-2024 |
| **Document P** | For the utilisation rate and amount of expenses by type of medical specialities, in 2024<br>For the trend in the day hospitalisation rate, in 2014-2024 |
| **Document P, SHA, ADH** | for the practice occurrences and analysis of patient care settings (private ambulatory or polyclinic, day or inpatient hospitalisation), in 2023 |

| | |
|---|---|
| **Analysis period** | 2014-2024 |

Document N : are monthly data sent by the health insurance funds to NIHDI, within three months. These data show the number of services provided, dates and the fees involved. Every six months, these data are compiled by the insurers, which also add data on patients: age, gender, social category and district of residence. N Documents, however, cannot be used to analyse the combinations of services received by individual patients

Document P : are six-monthly data sent by the health insurance funds to NIHDI, within four months. These data show the services provided, the service-provider, the prescriber, the place of provision of service, and the hospital where patients were treated. P Documents can be used to monitor medical consumption and pricing, but not (yet) to analyse services per patient.

Document SHA, ADH : are sent annually and within six months by the insurance funds to the NIHDI. They include all the services provided respectively in day admission and standard hospitalisation, in general hospitals per hospital stay..

Occurrence : Occurrence values are based on the most recent year that allows consolidation by patient between P and SHA-ADH documents, usually the year preceding the last year of the analysis period.

## E. Specific selection criteria

Several filters may have been applied to the data, so that only a selection of the population is considered in the analyses. If so, the filters used are shown in the table below :

| FILTERS APPLIED TO DATA | |
|---|---|
| **Sex** | All |
| **Age** | All |
| **-** | - |

The indicators presented in the analysis always refer to this population.

## F. Specialty of healthcare providers

| Specialty of the provider | Total providers | Concerned providers | % Providers | Median of H.C. services | Q3 of H.C. services | % Total H.C. services | % Total expenses |
|---|---|---|---|---|---|---|---|
| Radiology | 1.682 | 1.494 | 88,8% | 88 | 167 | 98,3% | 97,5% |
| Urology | 465 | 46 | 9,9% | 5 | 20 | 0,8% | 0,4% |
| Gastroenterology | 828 | 47 | 5,7% | 11 | 49 | 0,7% | 1,9% |
| Others | 3.715 | 15 | 0,4% | | | 0,1% | 0,1% |
| Total | 6.690 | 1.602 | 24,0% | - | - | 100,0% | 100,0% |

This table shows the following non-standardised data, by medical specialty (figures for the year 2024) :

- The number of service-providers who have recorded at least one service
- The number of service-providers recording services under the nomenclature codes selected for this analysis
- The service-providers for these codes as a percentage of the total number of service-providers recording provision of at least one service
- The median number and third quartile of services per service-provider (recording provision under these codes)
- Percentage of services provided (for codes included in volume)
- Percentage of expenditure (for codes included in expenditure)

## G. Specialty of prescribers

| Specialty of the provider | Total providers | Concerned providers | % Providers | Median of H.C. prescriptions | Q3 of H.C. prescriptions | % Total H.C. prescriptions | % Total expenses |
|---|---|---|---|---|---|---|---|
| General practitioners | 18.804 | 7.121 | 37,9% | 2 | 4 | 18,2% | 13,8% |
| Specialists in training | 8.644 | 3.736 | 43,2% | 5 | 11 | 17,5% | 16,9% |
| General surgery | 1.873 | 788 | 42,1% | 14 | 32 | 11,4% | 21,7% |
| Gastroenterology | 974 | 743 | 76,3% | 13 | 26 | 8,7% | 12,5% |
| Acute and emergency medicine | 851 | 675 | 79,3% | 10 | 29 | 8,6% | 5,7% |
| Geriatrics | 506 | 403 | 79,6% | 19 | 40 | 6,9% | 5,0% |
| Paediatrics | 2.123 | 1.043 | 49,1% | 4 | 10 | 5,9% | 5,5% |
| Urology | 602 | 369 | 61,3% | 11 | 26 | 4,9% | 3,3% |
| Anesthesia-reanimation | 3.021 | 538 | 17,8% | 2 | 5 | 4,0% | 2,8% |
| General practitioners in training | 4.061 | 1.049 | 25,8% | 2 | 4 | 2,4% | 1,7% |
| Non-specialized physicians | 3.372 | 557 | 16,5% | 2 | 5 | 2,0% | 1,6% |
| Undefined | | | | | | 1,6% | 2,4% |
| Internal medicine | 1.100 | 299 | 27,2% | 3 | 7 | 1,3% | 1,0% |
| Internal medicine nephro | 449 | 282 | 62,8% | 4 | 7 | 0,9% | 0,6% |
| Otorhinolaryngology | 859 | 288 | 33,5% | 2 | 5 | 0,8% | 1,0% |
| Pneumology | 788 | 324 | 41,1% | 2 | 4 | 0,7% | 0,6% |
| Gynaecology and obstetrics | 1.994 | 465 | 23,3% | 1 | 2 | 0,6% | 1,0% |
| Medical oncology | 400 | 205 | 51,3% | 3 | 7 | 0,6% | 0,5% |
| Others | 18.767 | 1.668 | 8,9% | | | 3,1% | 2,5% |
| Total | 69.188 | 20.553 | 29,7% | - | - | 100,0% | 100,0% |

This table shows, in order, the following non-standardised data per specialty (figures for the year 2024):

- The number of prescribers who have prescribed at least one service
- The number of prescribers prescribing the nomenclature codes selected for this analysis
- The prescribers prescribing these codes as a percentage of the number of prescribers prescribing at least one service
- The median number and third quartile of services per prescriber (prescribing these codes)
- Percentage of services prescribed (for codes included in volume)
- Percentage of expenditure (for codes included in expenditure)

## H. (Estimated) number of patients per year

Sometimes several codes (similar or different) relating to the same practice are charged several times on the same day and/or in the same year for the same patient.

To estimate the number of patients treated, the total number of services accounted for per year is divided by an average division factor (total average occurrence)

In this analysis, the average division factor is 1,26. The latter is calculated based on 2023 and results from dividing the total number of services provided by the total number of different insured persons who have used these services (by age group, sex and district).

This average division factor is called the total average occurrence. This total average occurrence is the product of the average occurrence per patient per day (**average number of services per day per patient**) and the average occurrence per patient per year (**average number of days per year per patient**). Explanations of these average occurrences per day and per year can be found in the appendix 'Frequency of practice occurrences (per patient)'.

However, volumes are not divided for the data on providers and prescribers (cf. sections 3.F et G), nor for the graphs and tables showing the distribution of volumes and occurrences of the practice (cf. 4.C et Annexes B à D).

## I. Standardisation

Data presented by geographical subset* or population category are standardised per year, based on age (by year), sex and preferential regime of the national population in 2024.

*Note: Districts with fewer than 100 000 insured persons are associated with a neighbouring district from the same province. The following districts are therefore considered together: Oostende/Veurne, Ieper/Diksmuide, Roeselare/Tielt, Gent/Eeklo, Charleroi/Thuin, Huy/Waremme, Namur/Philippeville, Neufchâteau/Marche-en-Famenne, Virton/Bastogne/Arlon. These regroupings and labels apply to all measurements, maps and graphs produced by district. Throughout the document, the concept of regrouped district is reflected in the use of the term "district*"

**Standardisation** renders populations comparable in relation to one or several criteria. If a difference is observed between these populations, we can therefore assume that it is not due to the criteria covered by the standardisation process.

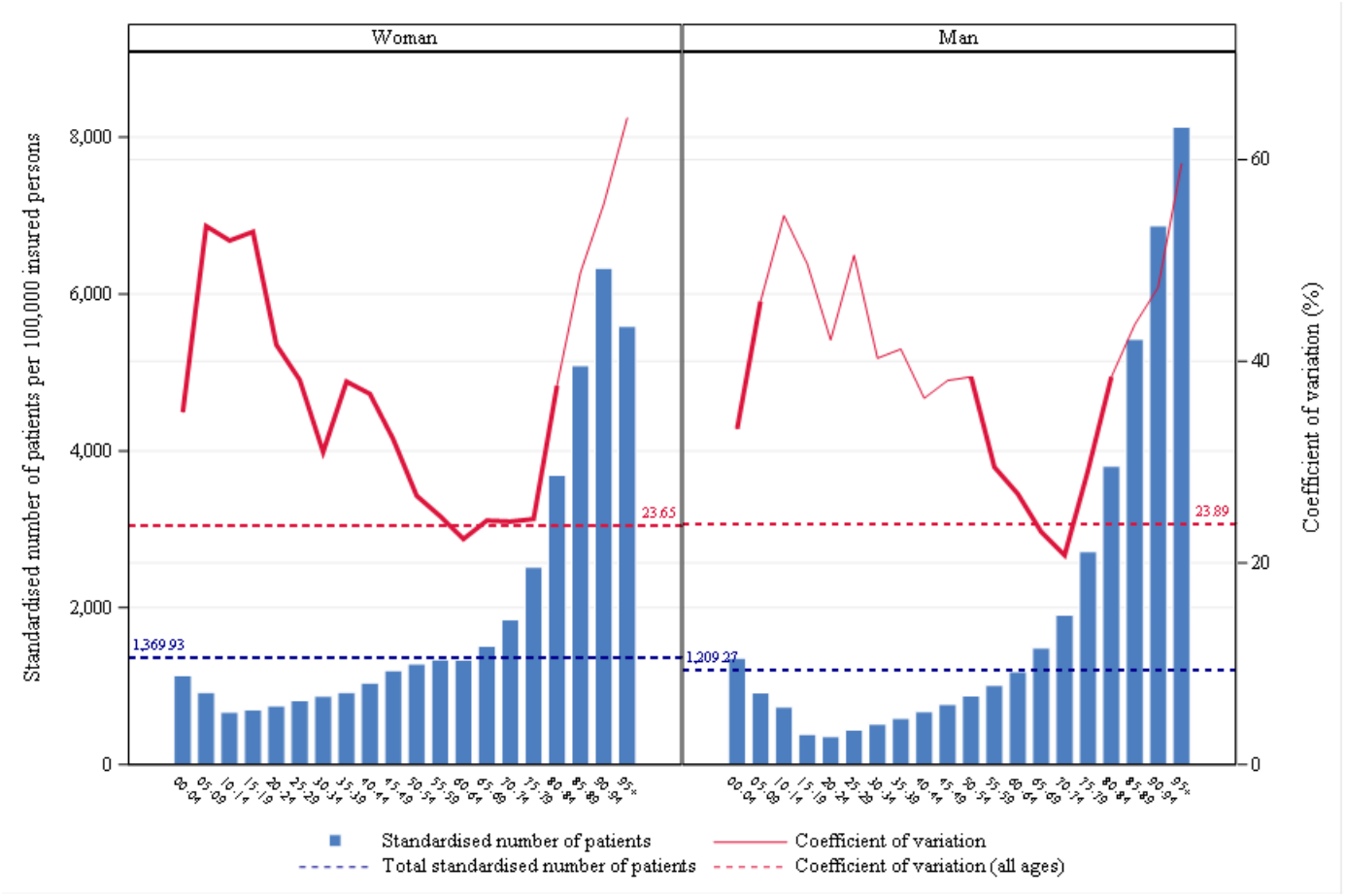
# 4. RESULTS

## A. National standardised usage rate

| | TOTAL |
|---|---|
| *Number of services per year* | *188.754* |
| Average occurrence per patient per day (average number of services per day) | 1,02 |
| Average occurrence per patient per year (average number of days per year) | 1,24 |
| Total average occurrence (divides the number of services) | 1,26 |
| *Estimated number of patients per year* | *149.727* |
| Standardised usage rate per 100 000 insured persons | 1.284 |

## B. Standardised usage rate by sex and age

| | TOTAL |
|---|---|
| *Estimated number of patients per year* | *149.727* |
| Median age (years) | 62 |
| Mean age (years) | 56,36 |
| Standardised usage rate: women (per 100 000) | 1.370 |
| Standardised usage rate: men (per 100 000) | 1.209 |
| Ratio women/men | 1,13 |
| Percentage of women | 57,29% |

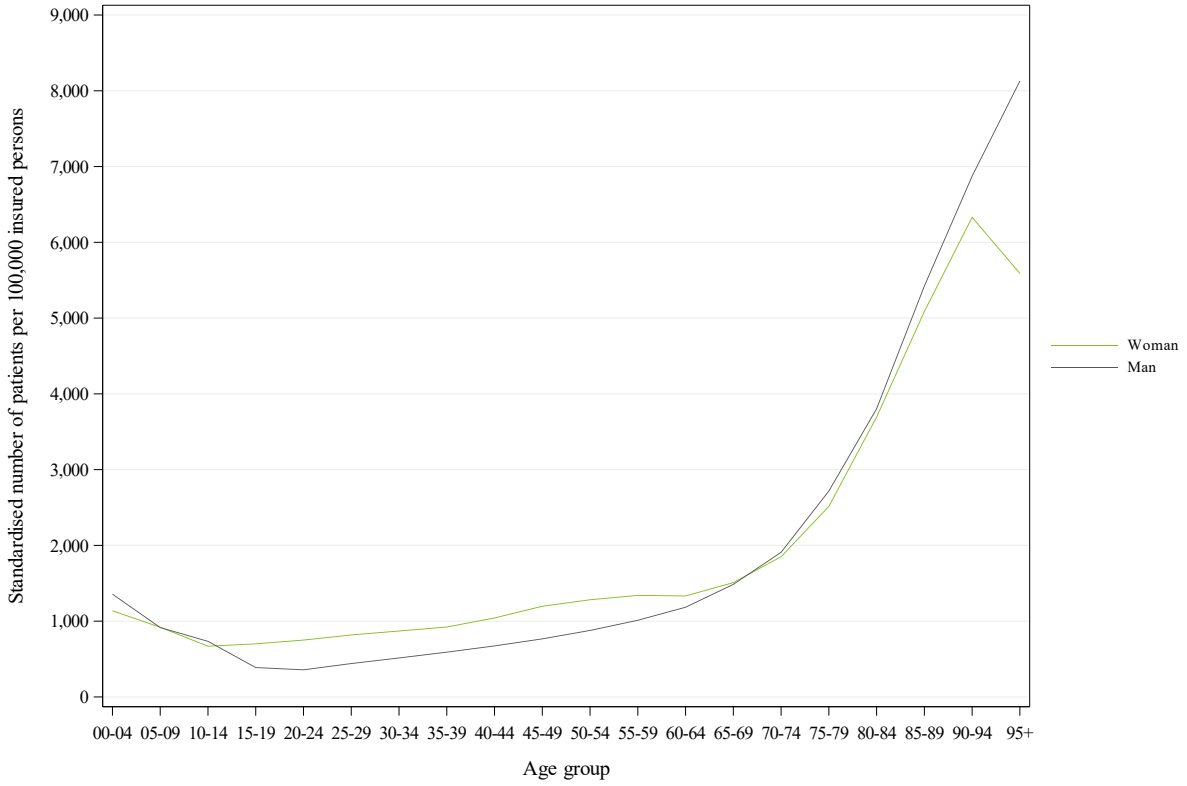



**Standardised usage rate per 100 000 insured persons, and coefficient of variation for the districts*, by age group and sex, for the year 2024**

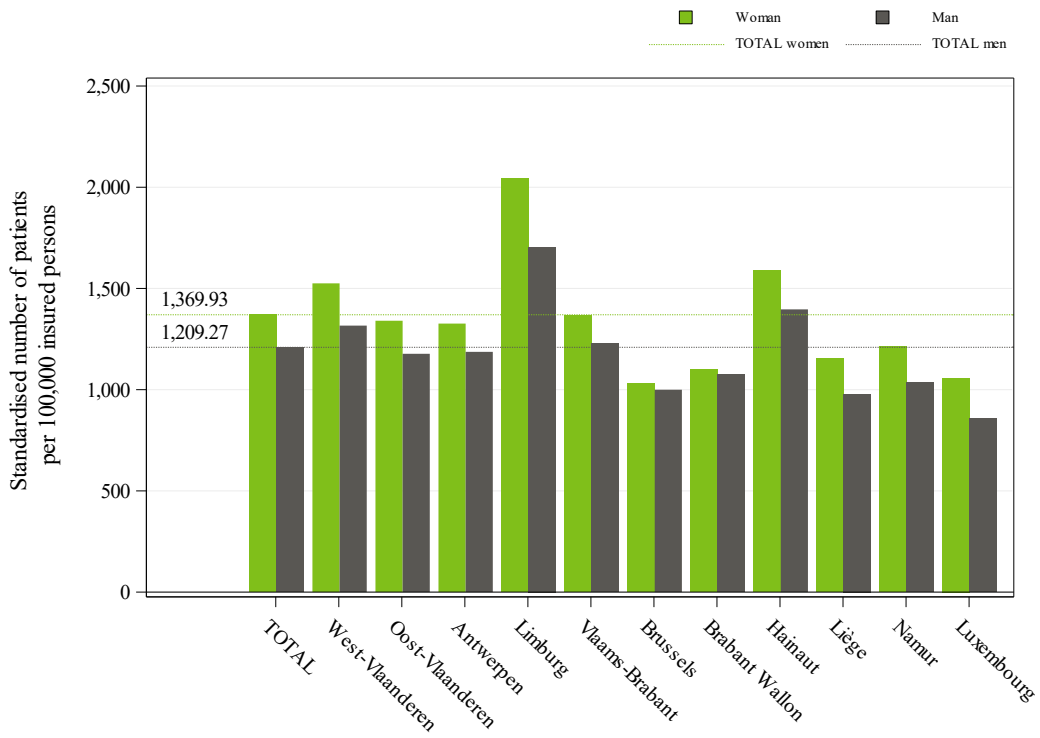
This figure is made up of bar charts for each sex.

The **coefficient of variation**, shown by the red line, measures the relative dispersion of the standardised usage rates observed for each district*, by age group and sex (standard deviation divided by the mean). This line is shown in bold for age groups where the coefficient of variation can be validly interpreted (i.e. for age groups in which there are sufficient insured persons per district* to allow for a proper comparison).

The left-hand vertical axis of the graph represents the standardised usage rate, and the right-hand axis the coefficient of variation. The horizontal axis shows the age groups. The horizontal dotted lines show the total values of the standardised usage rates (in blue) and of the coefficient of variation (in red).




**Comparison of the standardised usage rates by age group and by sex (per 100 000 insured persons) in 2024**




This histogram shows standardised usage rates by province and by sex.

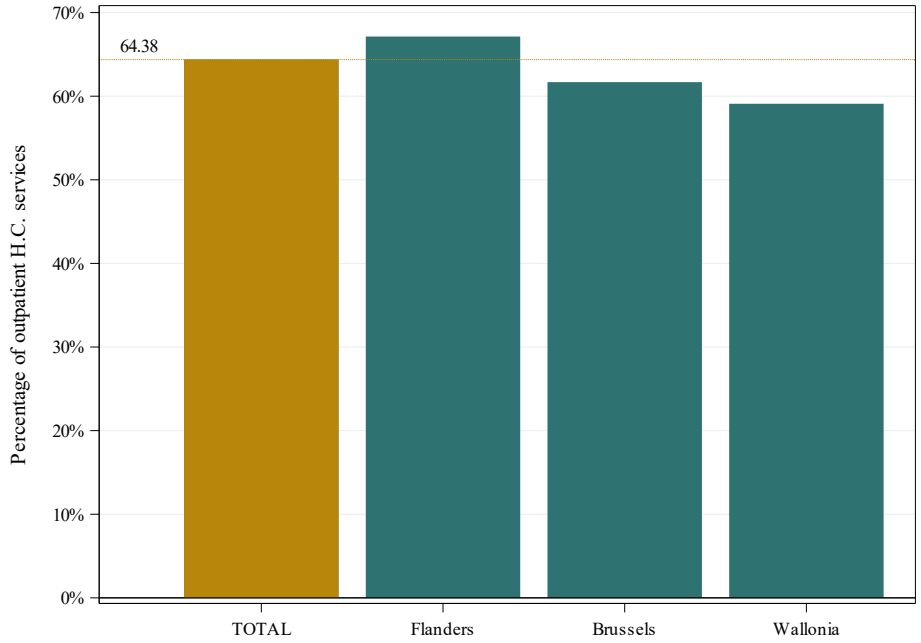
The grey bars show the rates for men, while the green bars show the rates for women, for each province.

The grey and green broken lines show the total standardised usage rates, again grey for men, green for women.

**Standardised usage rate per 100 000 insured persons, by sex and by province for the year 2024**

## C. Rate of outpatient care

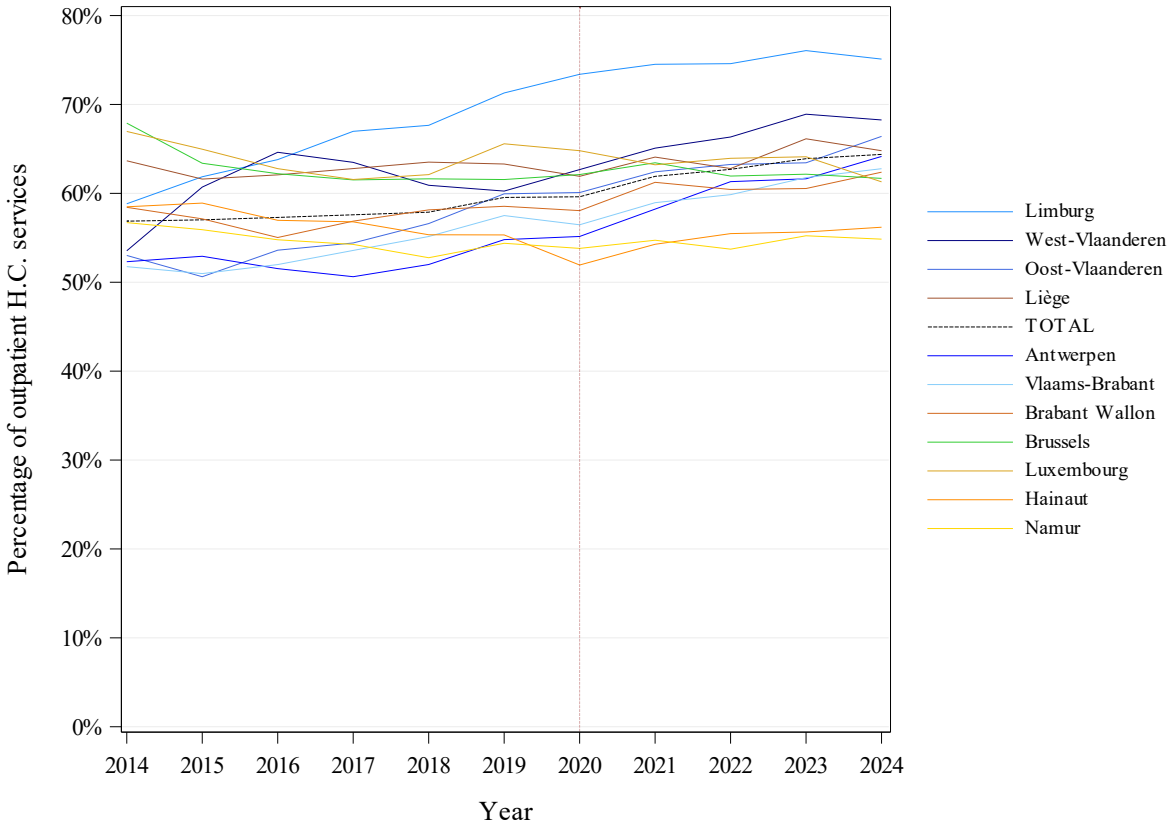
| | TOTAL |
|---|---|
| *Number of services per year* | *188.754* |
| Percentage of out-patient care | 64,38% |




**Percentage of outpatient care, total and by region**

This graph shows the percentage of outpatient services (including hospital day admissions), i.e. the number of outpatient services provided as a percentage of total services (outpatient and hospital stays).

Besides the bar per region, there is a bar for the entire Belgian population. A dotted line also shows this overall ratio.




**Trends in the percentage of outpatient care by province**

The year 2020 was highlighted by a vertical dashed line, in order to draw the attention on the impact of the COVID-19 crisis.

A complement to this chapter, about the patient care per type, is enclosed in this report (see Appendix C).

## D. Standardised usage rate by reimbursement scheme

| | TOTAL |
|---|---|
| *Estimated number of patients per year* | *149.727* |
| Percentage provided under the preferential reimbursement scheme | 32,28% |
| Standardised usage rate with preferential reimbursement scheme (per 100 000) | 1.763 |
| Standardised usage rate without preferential reimbursement scheme (per 100 000) | 1.153 |
| Ratio Preferential scheme /General scheme | 1,53 |



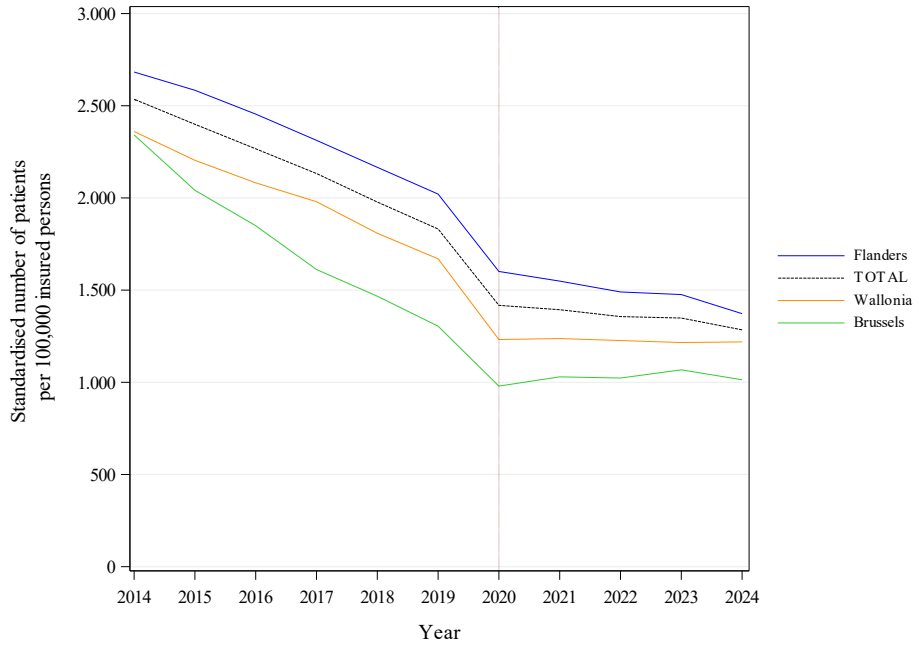

**Standardised usage rate by reimbursement scheme and by region**

This graph shows the standardised usage rates per 100 000 insured with (in red) and without (in grey) the preferential reimbursement scheme, by region and in total.

The red and grey dotted lines show the overall standardised rates of use of patients per 100 000 insured, with and without the preferential reimbursement scheme, respectively.

## E. Trends in standardised usage rates

| | TOTAL | Statistical significance |
|---|---|---|
| *Estimated number of patients per year* | *149.727* | |
| **Trend (2014-2024)** | **-6,57%** | ***** (-7.39%)** |
| Trend (2014-2022) | -7,52% | *** |
| Trend (2022-2024) | -2,69% | |



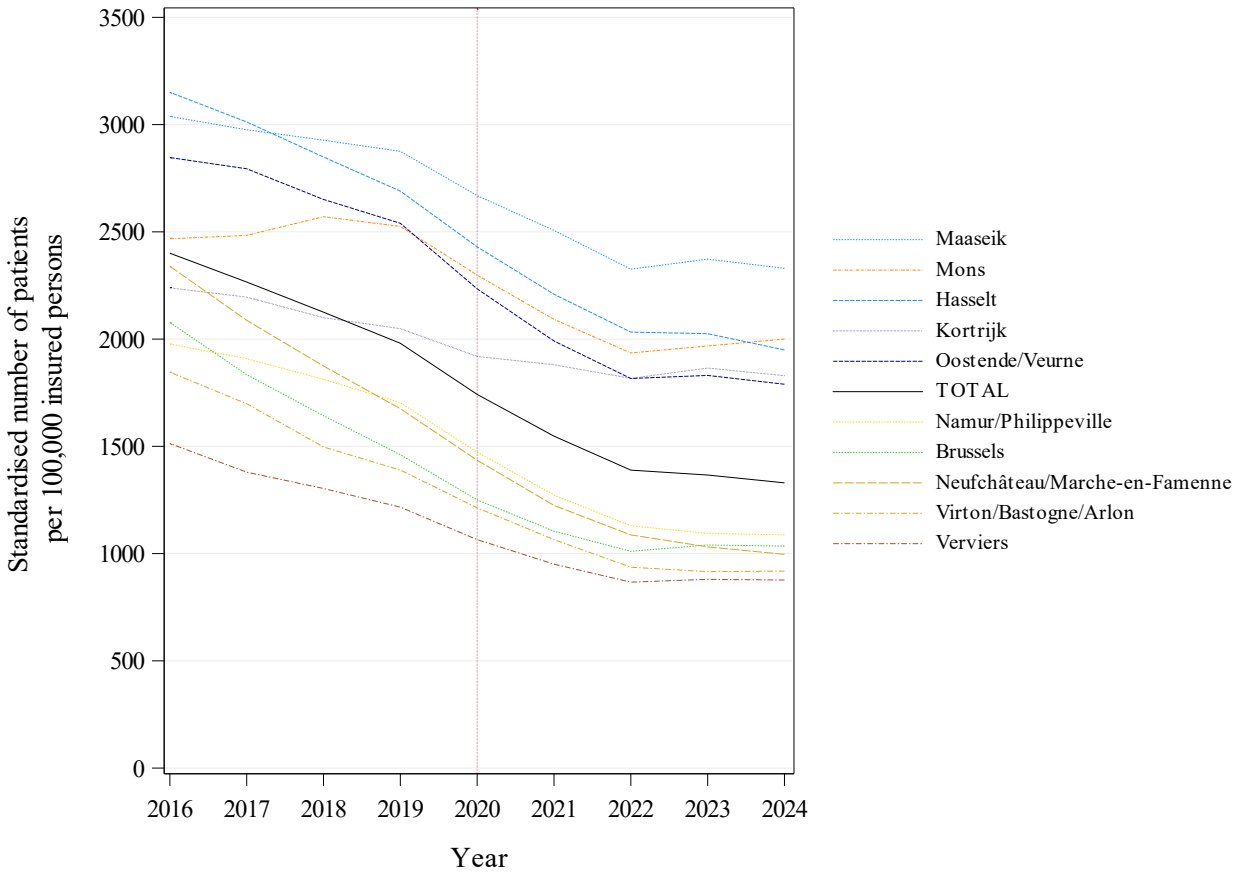

**Trends in the standardised usage rate per 100 000 insured persons, by region**

These trends correspond to the average annual growth rate.

A non-significant statistical test indicates that the trend estimated by the model (in brackets) is stable, or that there is no break in the trend.

This graph shows a coloured curve for each region and a black curve for the entire Belgian population. The horizontal axis shows the years, and the vertical axis shows the standardised usage rate per 100 000 insured persons.

Note : The year 2020 was highlighted by a vertical dashed line, in order to draw the attention on the impact of the COVID-19 crisis.




**Trends in the standardised usage rate per 100 000 insured persons by district***

This graph shows a coloured line for each district* and a black line for the entire Belgian population. The horizontal axis shows the years, and the vertical axis shows the standardised usage rate per 100 000 insured persons.

To better highlight changes over time, the rates shown are **rolling averages** of the rates for the three years preceding the year in question (including the year itself).

The graph only shows the five districts* with the highest average rates and the five districts* with the lowest average rates over the last 3 years studied (excluding the districts of Hainaut heavily impacted by the 2019 administrative reorganization).

Note : The year 2020 was highlighted by a vertical dashed line, in order to draw the attention on the impact of the COVID-19 crisis.

| | | Usage Rate | Annual increase | | | |
|---|---|---|---|---|---|---|
| | | ***2024*** *(per $10^5$ insured)* | **2014-2024** | **2014-2022** | **2022-2024** | **Structural break** |
| **Provinces** | West Flanders | *1.417* | -5,39% | -5,67% | -4,28% | NS |
| | East Flanders | *1.250* | -5,70% | -6,54% | -2,26% | NS |
| | Antwerp | *1.251* | -8,64% | -9,07% | -6,90% | NS |
| | Limburg | *1.869* | -5,00% | -5,46% | -3,13% | NS |
| | Flemish Brabant | *1.290* | -6,34% | -7,32% | -2,33% | NS |
| | Brussels | *1.014* | -8,03% | -9,83% | -0,46% | NS |
| | Walloon Brabant | *1.075* | -6,83% | -7,84% | -2,65% | NS |
| | Hainaut | *1.488* | -5,33% | -6,57% | -0,22% | NS |
| | Liège | *1.064* | -7,62% | -9,45% | 0,12% | NS |
| | Namur | *1.112* | -5,87% | -7,25% | -0,13% | NS |
| | Luxembourg | *955* | -8,39% | -10,37% | -0,03% | NS |
| **Regions** | Flanders | *1.372* | -6,48% | -7,09% | -4,03% | NS |
| | Brussels | *1.014* | -8,03% | -9,83% | -0,46% | NS |
| | Wallonia | *1.219* | -6,39% | -7,86% | -0,31% | NS |
| | **TOTAL** | ***1.284*** | **-6,57%** | **-7,52%** | **-2,69%** | *** |

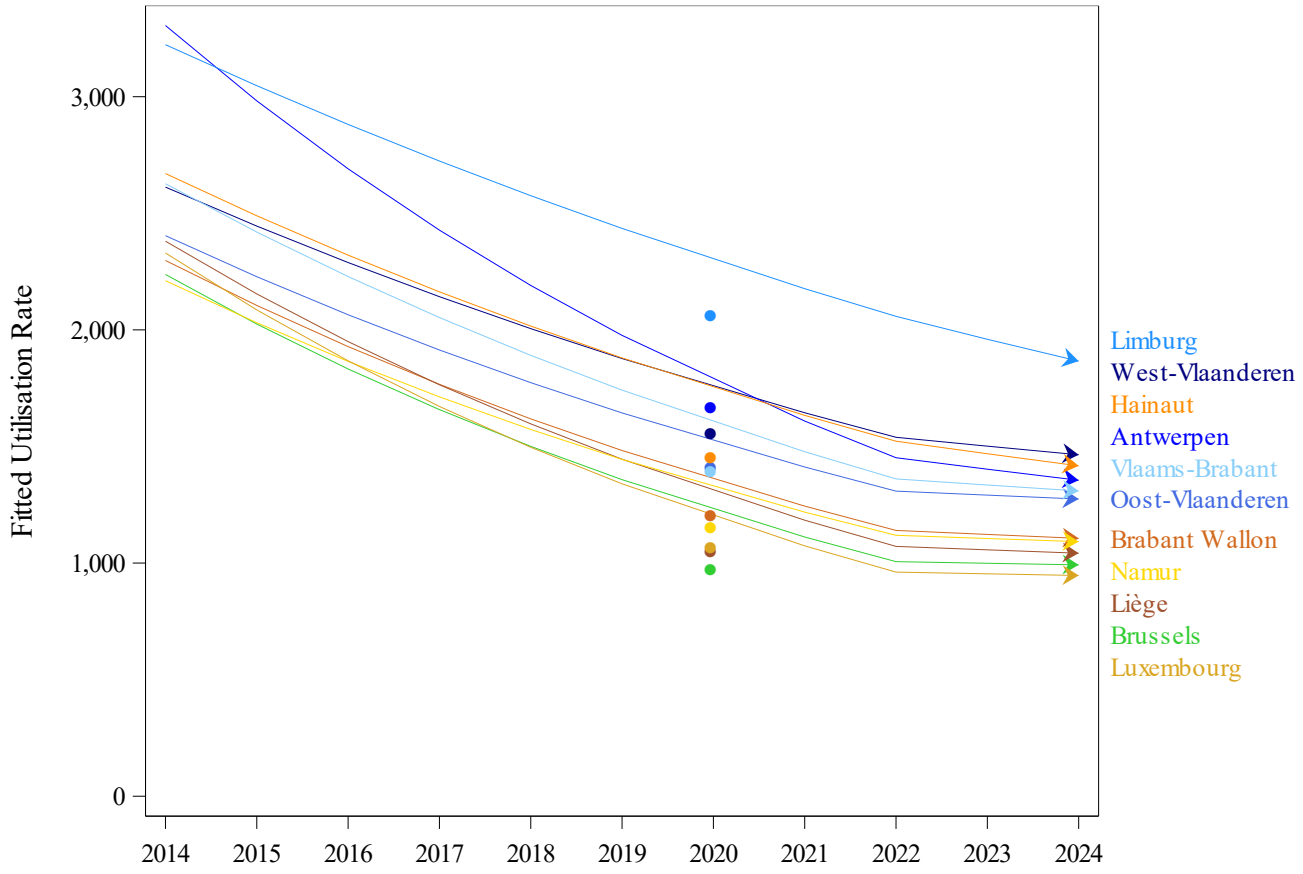
**Trends in the usage rates, by province and region**

This table reports the standardised **usage rates** for the last year analysed (2024), as well as the average **rates of increase**, by province, by region and in total, for the entire period (2014-2024), for the last years (2022-2024) and for the period preceding the last years (2014-2022).

In order to find out whether the trend in the last years differs from that in the years before, a linear mixed model was fitted in two steps. In the first step a change in trend on the national level is tested. If this test is significant, in a second step, the model tests whether the difference in trend is significant for each province, region and at the national level. The data of 2020 are excluded from the models.

The significance of the test for a change in trend is reported in the Structural break column : * P-value ≤ 0.05 / ** P-value ≤ 0.01 / *** P-value ≤ 0.001 and NS for a non-significant result.

'NA' is shown where the nomenclature codes selected for the analysis have not been used for the entire last period or when the statistical tests cannot be evaluated.



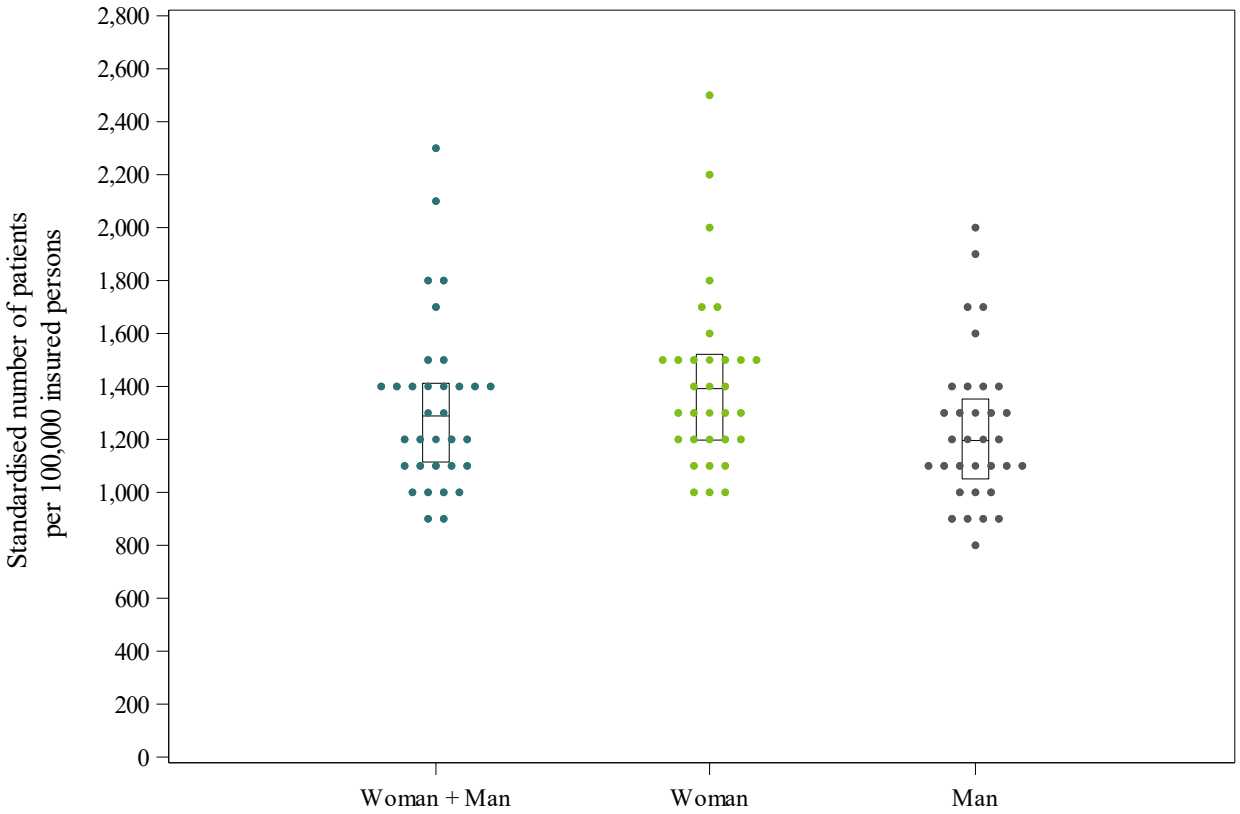

**Trend break assessment model by province – Regression lines**

Regression lines per province showing a possibly different slope for the last years (2022-2024) compared to the years before (2014-2022).

Data of 2020 was excluded from this analysis, but is indicated on the graph for information.

## F. Geographical variations in standardised usage rates

| | TOTAL |
|---|---|
| *Estimated number of patients per year* | *149.727* |
| Coefficient of variation (2024) | 23,64 |
| Coefficient of variation (2022-2024) | 24,01 |
| Coefficient of variation (2014-2016) | 18,3 |
| *Statistically significant difference ? ($p \leq 0.05$)* | *No* |

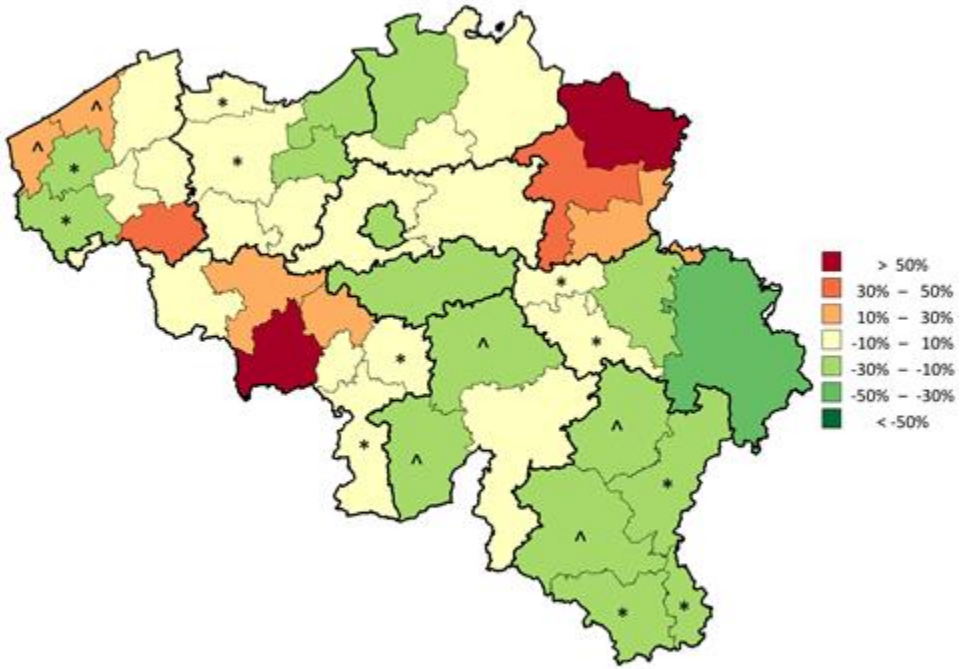



**'Dot plot' showing standardised usage rates by district*, by sex**

A **dot plot** is a distribution chart, which is useful for highlighting groups in the data, gaps in the distribution and outliers. Here, each dot represents the usage rate of a district*, for its entire population or broken down by sex.

The rates are rounded to the nearest unit, ten, hundred, etc., depending on the value of the maximum rate, in order to better group the values.

The graph also shows a box with the 25th, 50th and 75th percentiles of the non-rounded standardised usage rates for all districts. The bottom line of the box represents the 25th percentile, while the upper line represents the 75th percentile. The line inside the box represents the 50th percentile.




**Map showing distribution of standardised usage rates, by district***

* Districts marked with * or ^ are grouped together within the same province.
see page 13, Standardisation

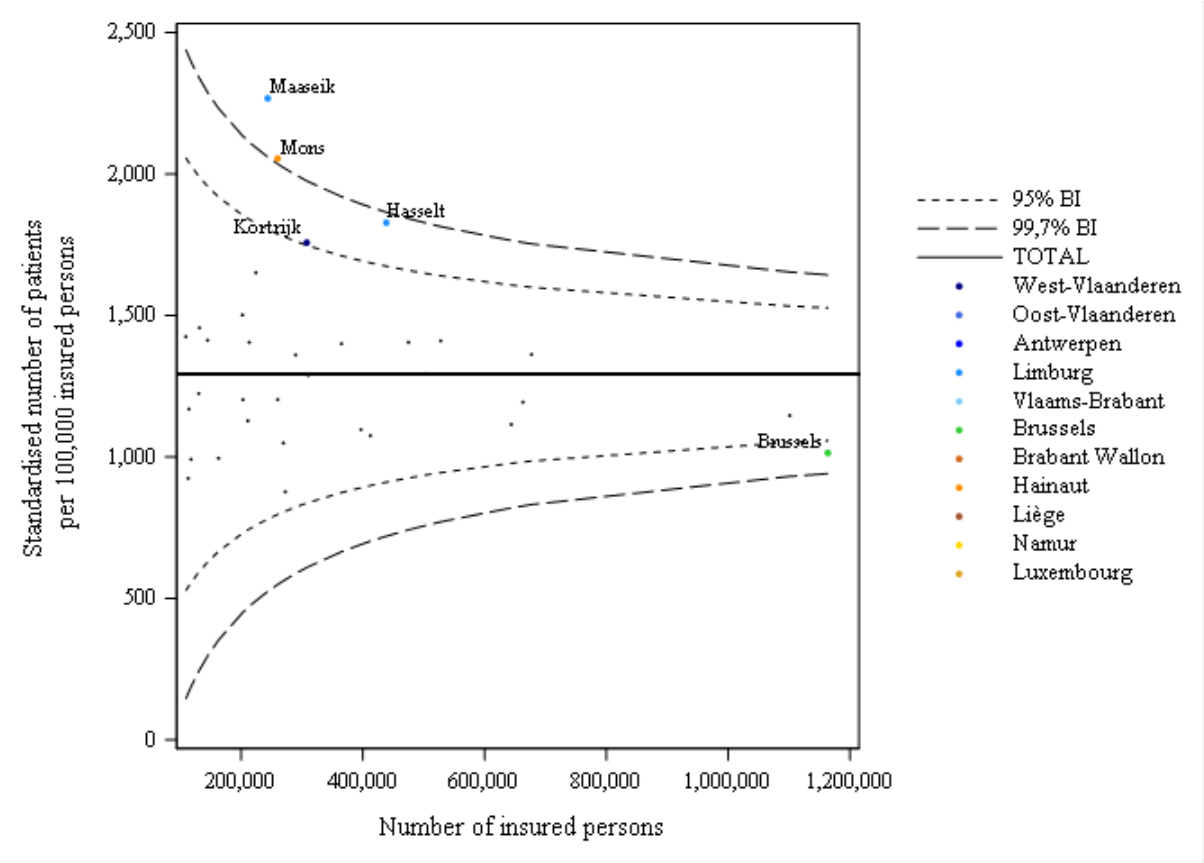
On this map of Belgium, thin lines show the boundaries of the districts, while thick lines show the provincial borders.

The districts* are coloured using a colour scale based on the level of usage rate in the district* compared to the Belgian national rate (overall rate). This ratio is expressed as a percentage: e.g. 0% if the district* rate is equal to the overall rate, 20% if the rate is 20% above the overall rate, and -20% if the rate is 20% below the overall rate.

The percentages are calculated using the standardised rates of the last year analysed, and are displayed in bands of 20%. The following colour coding applies:

| Colour | Category |
|---|---|
| | More than 50% |
| | Between 30% and 50% |
| | Between 10% and 30% |
| | Between - 10% and 10% |
| | Between -30% and -10% |
| | Between -50% and - 30% |
| | Less than -50% |
| | Not used |

N.B.: The interpretation of this map is to be done in parallel with the funnel plot (next page).




**«Funnel plot » showing the standardised usage rates by district* by the number of insured persons**

In this graph, the standardised usage rate in a district* is positioned versus the size of its population. Besides the dots representing the districts*, 95% and 99.7% **confidence intervals** are also shown on the graph. These are dependent of the size of the districts*.

The thicker horizontal line shows the national standardised usage rate. The outlier districts* are identified as those districts* that fall outside the 99.7% confidence intervals, the zone between the 95% and 99.7% confidence intervals being considered as "warning zone".

N.B.: The interpretation of this graph is to be done in parallel with the map of the distribution of usage rates (previous page).

## G. Standardised healthcare expenditure borne by the insurance

| | TOTAL |
|---|---|
| *Number of services per year* | *188.754* |
| *Annual expenditure (€)* | *7.256.824* |
| Average cost per patient (€) | 48,47 |
| Average cost per insured [1] (€) | 0,62 |

[1] Reminder: Expenditure is based on the insured selected for the analysis (see section 3.E, Specific selection criteria)

| | | Standardised expenditure (per insured[1]) | Relative difference compared to total |
|---|---|---|---|
| Provinces | West Flanders | 0,64 € | 3,23% |
| | East Flanders | 0,57 € | -8,06% |
| | Antwerp | 0,53 € | -14,52% |
| | Limburg | 0,77 € | 24,19% |
| | Flemish Brabant | 0,59 € | -4,84% |
| | Brussels | 0,55 € | -11,29% |
| | Walloon Brabant | 0,6 € | -3,23% |
| | Hainaut | 0,79 € | 27,42% |
| | Liège | 0,64 € | 3,23% |
| | Namur | 0,65 € | 4,84% |
| | Luxembourg | 0,57 € | -8,06% |
| Regions | Flanders | 0,6 € | -3,23% |
| | Brussels | 0,55 € | -11,29% |
| | Wallonia | 0,69 € | 11,29% |
| | **TOTAL** | **0,62 €** | |

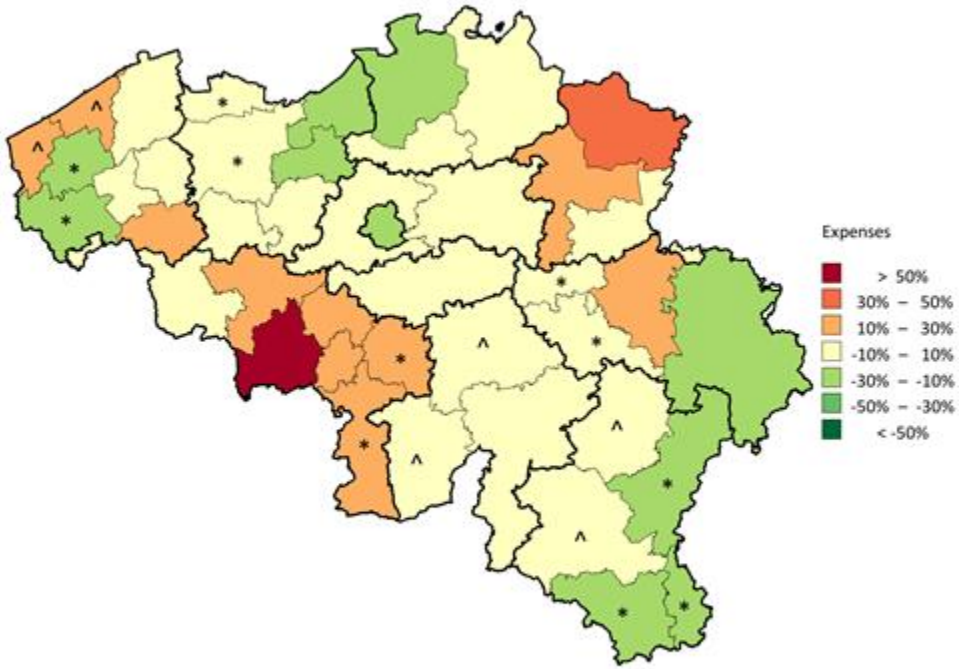
**Regional and provincial distribution of standardised expenditure (2024)**

[1] Reminder: Expenditure is based on the insured selected for the analysis (see section 3.E, Specific selection criteria)

## Trends in expenditure, by service and by nomenclature code

| Nomenclature Codes | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | % Average yearly growth | % Services 2024 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 451010-451021 | 21,64 | 21,69 | 21,70 | 21,69 | 21,92 | 21,93 | 22,11 | 22,26 | 22,64 | 23,95 | 25,42 | 1,62% | 74,9% |
| 451430-451441 | 82,73 | 82,81 | 82,71 | 82,70 | 83,55 | 83,58 | 84,37 | 85,04 | 86,40 | 91,12 | 96,59 | 1,56% | 11,7% |
| 450516-450520 | 16,16 | 16,14 | 16,17 | 16,11 | 16,32 | 16,29 | 16,42 | 16,52 | 16,74 | 17,72 | 18,77 | 1,50% | 3,5% |
| 451135-451146 | 23,70 | 23,75 | 23,74 | 23,71 | 24,01 | 24,00 | 24,23 | 24,41 | 24,81 | 26,31 | 27,92 | 1,65% | 2,0% |
| 451710-451721 | 66,51 | 66,62 | 66,53 | 66,47 | 67,18 | 67,24 | 67,86 | 68,33 | 69,44 | 73,35 | 77,80 | 1,58% | 1,9% |
| 451754-451765 | 98,65 | 98,83 | 98,84 | 98,82 | 99,94 | 100,09 | 101,00 | 101,77 | 103,50 | 109,33 | 115,74 | 1,61% | 1,6% |
| 451511-451522 | 114,37 | 114,62 | 114,65 | 114,65 | 116,04 | 116,02 | 116,96 | 118,05 | 119,86 | 126,74 | 134,21 | 1,61% | 1,0% |
| 451393-451404 | 50,98 | 51,17 | 51,23 | 51,19 | 51,81 | 51,80 | 52,18 | 52,53 | 53,48 | 56,62 | 60,07 | 1,65% | 1,0% |
| 461510-461521 | 15,99 | 16,08 | 16,06 | 16,07 | 16,28 | 16,27 | 16,23 | 16,53 | 16,91 | 17,76 | 18,77 | 1,62% | 0,8% |
| 462431-462442 | 82,54 | 82,69 | 82,71 | 82,66 | 83,60 | 83,77 | 83,70 | 84,26 | 85,45 | 90,46 | 95,60 | 1,48% | 0,6% |
| 451356-451360 | 66,43 | 66,59 | 66,65 | 66,57 | 67,37 | 67,34 | 67,94 | 68,36 | 69,48 | 73,45 | 77,97 | 1,61% | 0,5% |
| 451474-451485 | 86,41 | 86,71 | 86,91 | 86,88 | 87,82 | 88,08 | 88,80 | 89,49 | 91,16 | 96,16 | 101,79 | 1,65% | 0,2% |
| 462512-462523 | 114,29 | 114,73 | 114,68 | 114,75 | 116,33 | 116,29 | 116,30 | 117,38 | 118,61 | 126,19 | 133,17 | 1,54% | 0,1% |
| 450015-450026 | 16,41 | 16,00 | 16,45 | 16,45 | 16,45 | 16,79 | 16,73 | 17,12 | 17,22 | 18,19 | 19,65 | 1,82% | 0,1% |
| 462711-462722 | 67,85 | 67,44 | 66,86 | 67,50 | 68,45 | 68,29 | 68,16 | 67,97 | 70,21 | 73,83 | 78,37 | 1,45% | 0,0% |
| 451312-451323 | 45,78 | 46,36 | 46,26 | 46,72 | 46,96 | 47,11 | 47,25 | 47,22 | 48,23 | 50,81 | 53,63 | 1,59% | 0,0% |

The average expenditure per nomenclature code and per year is listed for the codes selected in terms of volume (see section 3.A), for which services were invoiced in 2024. They are ranked in descending order of frequency, according to the percentage of the volume served in 2024 (last column).
When there are a large number of nomenclature codes concerned, the list is limited to those that account for at least 1% of the total volume.




**Map showing distribution of standardised expenditure, by district* (per insured person)**

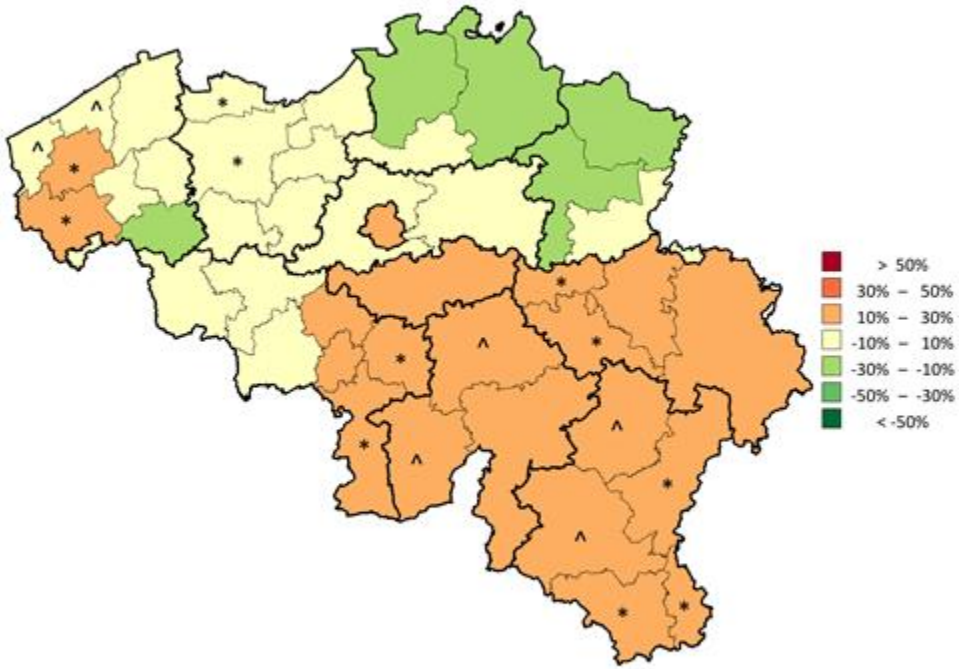
On this map of Belgium, thin lines show the boundaries of the districts, while thick lines show the provincial borders.

The districts* are coloured using a colour scale based on the level of expenditure per insured in the district* compared to Belgian national (overall) expenditure per insured. This ratio is expressed as a percentage: e.g. 0% if expenditure in the district* is equal to the overall expenditure, 20% if it is 20% higher, and -20% if it is 20% lower.

The percentages are calculated using the standardised expenditure of the last year analysed and are displayed in bands of 20%. The following colour coding applies:

| Colour | Category |
|---|---|
| | More than 50% |
| | Between 30% and 50% |
| | Between 10% and 30% |
| | Between - 10% and 10% |
| | Between -30% and -10% |
| | Between -50% and - 30% |
| | Less than -50% |
| | No expenditure |

* Districts marked with * or ^ are grouped together within the same province.
see page 13, Standardisation




On this map, the districts* are coloured using a colour scale based on the level of expenditure per patient in the district * versus the national expenditures per patient.

This comparison is expressed as a percentage:

| Colour | Category |
|---|---|
| | More than 50% |
| | Between 30% and 50% |
| | Between 10% and 30% |
| | Between - 10% and 10% |
| | Between -30% and -10% |
| | Between -50% and - 30% |
| | Less than -50% |
| | No expenditure |

**Map showing distribution of standardised expenditure, by district* (per patient)**

* Districts marked with * or ^ are grouped together within the same province.
see page 13, Standardisation

Standardised expenditure per patient in 2024 and occurrences of practice per patient in 2023 (See Appendix B), by demographic category

| | Estimated std. expenditure per patient | | Occurrence per year | Occurrence per year | Occurrence per day |
|---|---|---|---|---|---|
| | (€) | Tot. Relative Diff. (%) | (Services) | (Days) | (Services) |
| TOTAL | 48,47 | | 1,26 | 1,24 | 1,02 |
| **Sex** | | | | | |
| Men | 44,55 | -8,09% | 1,28 | 1,26 | 1,01 |
| Women | 51,70 | 6,66% | 1,25 | 1,23 | 1,02 |
| **Reimbursement scheme** | | | | | |
| General | 47,10 | -2,81% | 1,24 | 1,22 | 1,01 |
| Preferential | 52,40 | 8,12% | 1,31 | 1,29 | 1,02 |
| **Region** | | | | | |
| Flanders | 43,98 | -9,25% | 1,26 | 1,24 | 1,02 |
| Brussels | 54,54 | 12,54% | 1,28 | 1,25 | 1,02 |
| Wallonia | 56,55 | 16,68% | 1,26 | 1,24 | 1,01 |
| **Age** | | | | | |
| 00-04 | 52,84 | 9,01% | 1,44 | 1,39 | 1,04 |
| 05-09 | 32,92 | -32,07% | 1,13 | 1,12 | 1,01 |
| 10-14 | 33,71 | -30,44% | 1,14 | 1,13 | 1,00 |
| 15-19 | 37,04 | -23,57% | 1,18 | 1,17 | 1,01 |
| 20-24 | 44,40 | -8,38% | 1,16 | 1,15 | 1,01 |
| 25-29 | 51,26 | 5,76% | 1,18 | 1,17 | 1,01 |
| 30-34 | 55,52 | 14,54% | 1,19 | 1,17 | 1,01 |
| 35-39 | 57,01 | 17,62% | 1,21 | 1,20 | 1,01 |
| 40-44 | 58,58 | 20,86% | 1,21 | 1,19 | 1,01 |
| 45-49 | 59,75 | 23,28% | 1,21 | 1,19 | 1,02 |
| 50-54 | 60,37 | 24,56% | 1,25 | 1,23 | 1,02 |
| 55-59 | 59,92 | 23,62% | 1,27 | 1,25 | 1,02 |
| 60-64 | 56,69 | 16,97% | 1,28 | 1,25 | 1,02 |
| 65-69 | 53,57 | 10,52% | 1,29 | 1,26 | 1,02 |
| 70-74 | 51,18 | 5,59% | 1,30 | 1,27 | 1,02 |
| 75-79 | 46,69 | -3,66% | 1,31 | 1,29 | 1,02 |
| 80-84 | 41,49 | -14,39% | 1,30 | 1,29 | 1,01 |
| 85-89 | 37,19 | -23,28% | 1,29 | 1,28 | 1,01 |
| 90-94 | 35,92 | -25,89% | 1,30 | 1,29 | 1,01 |
| 95+ | 34,11 | -29,63% | 1,29 | 1,29 | 1,01 |

# 5. APPENDICES

## A. Analysis of variance (ANOVA), except Brussels

| Statistical significance of the differences observed in 2024 | | |
|---|---|---|
| ***By region?*** | No | NS |
| ***By sex?*** | Yes | *** |
| ***By reimbursement scheme?*** | Yes | *** |
| ***By sex and per region?*** | No | NS |
| ***By reimbursement scheme and per region?*** | Yes | *** |
| ***By sex and per reimbursement scheme?*** | Yes | * |
| ***By sex and reimbursement scheme and per region?*** | No | NS |

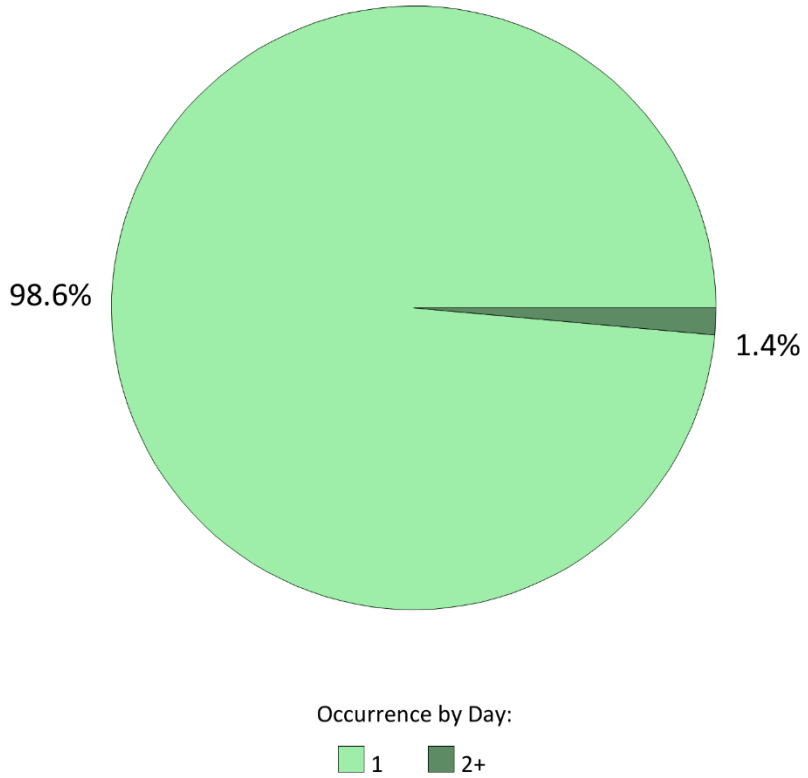
In order to be able to assess the significance of the observed differences, a linear mixed ANOVA model was fitted to the data of all districts* of the Walloon and Flemish regions, after standardising for age. The model has region, sex and reimbursement scheme as fixed effects and also contains all two-way and three-way interactions between these effects.

In order to interpret the model correctly, first the three-way interaction should be evaluated, followed by the two-way interactions and finally by the main effects. If the three-way interaction is significant, the interpretation of the model should be done at this level only and the two-way interactions and main effects should not be interpreted. If the three-way interaction is not significant, the two-way interactions are evaluated. Every main effects that appears in a significant interaction should be interpreted at the level of the interaction and not at the level of that main effect. Main effects can only be interpreted directly if they don't appear in a significant interaction.

The **asterisks** represent the level of statistical significance of the tests: * P-value ≤ 0,05 / ** P-value ≤ 0,01 / *** P-value ≤ 0,001 or NS for a non-significant result.

## B. Frequency of practice occurrences (per patient)

**Average number of services per day per patient : 1,02**

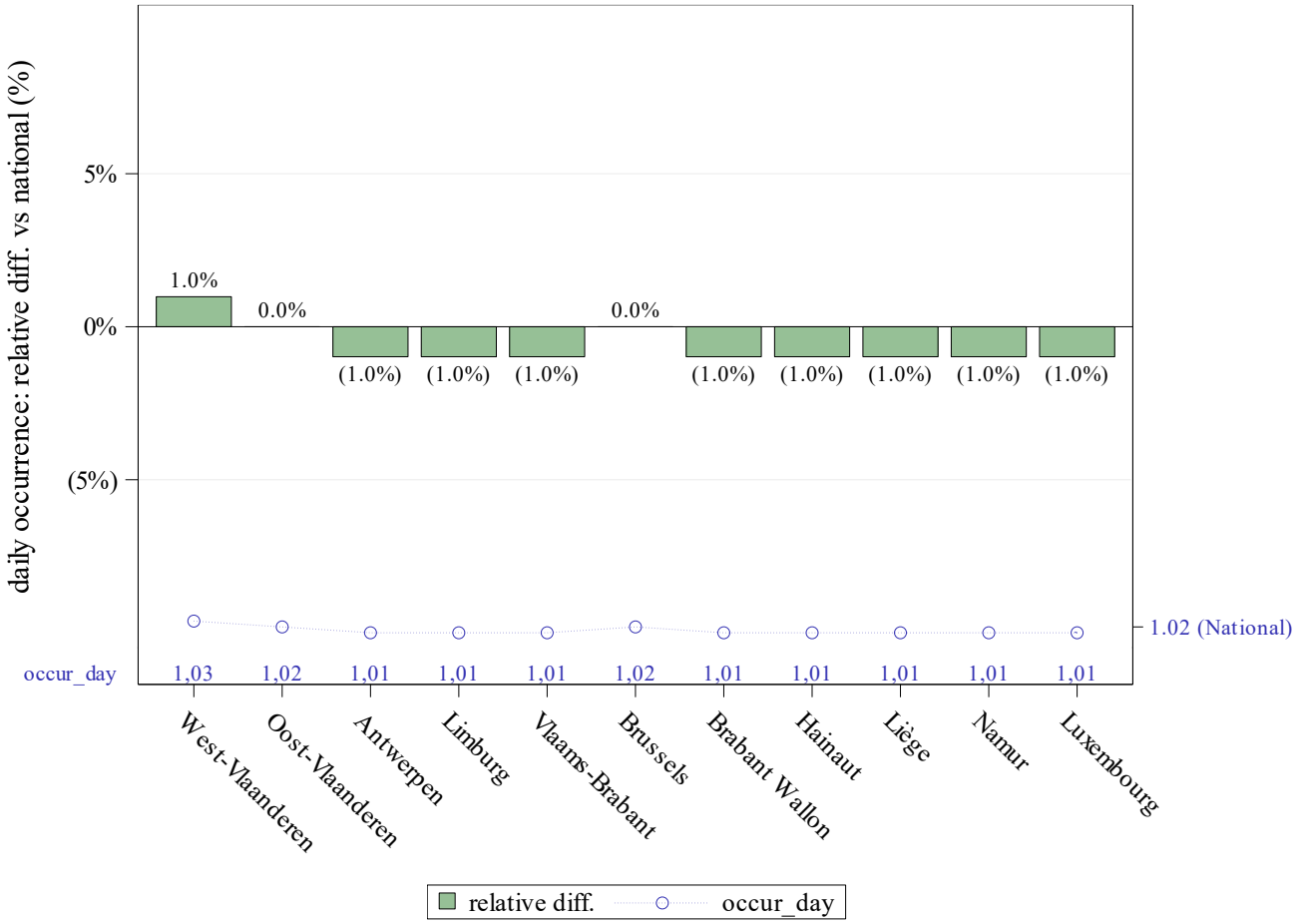



**Distribution of patient days by occurrence of practice per day (2023)**

Sometimes several codes (similar or different) relating to the same practice are charged on the same day for the same patient.

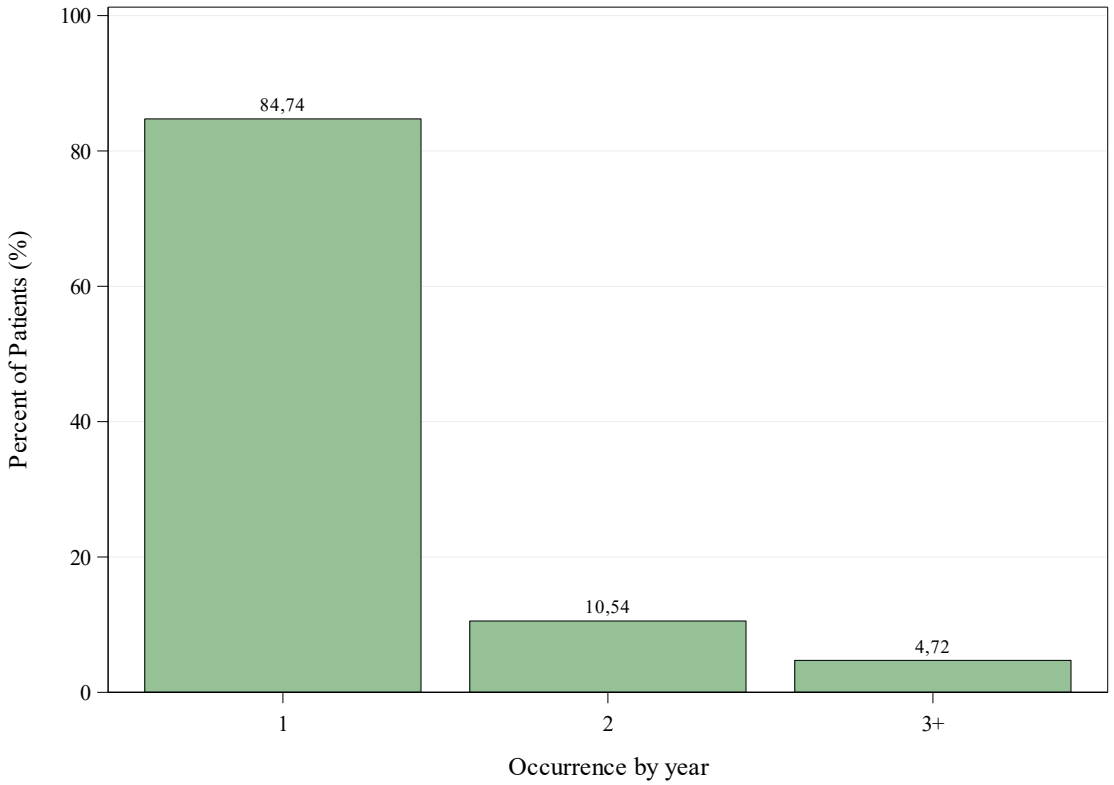
This pie chart shows the distribution of patient days according to the number of services performed on the same day for the same patient.

These frequency analyses of occurrences are carried out over the year **2023** using the following databases: Documents P, ADH and SHA.




**Average number of services <u>per day</u> per patient by province and variation in relation to the national average (2023)**

**Average number of days per patient over the year : 1,24**

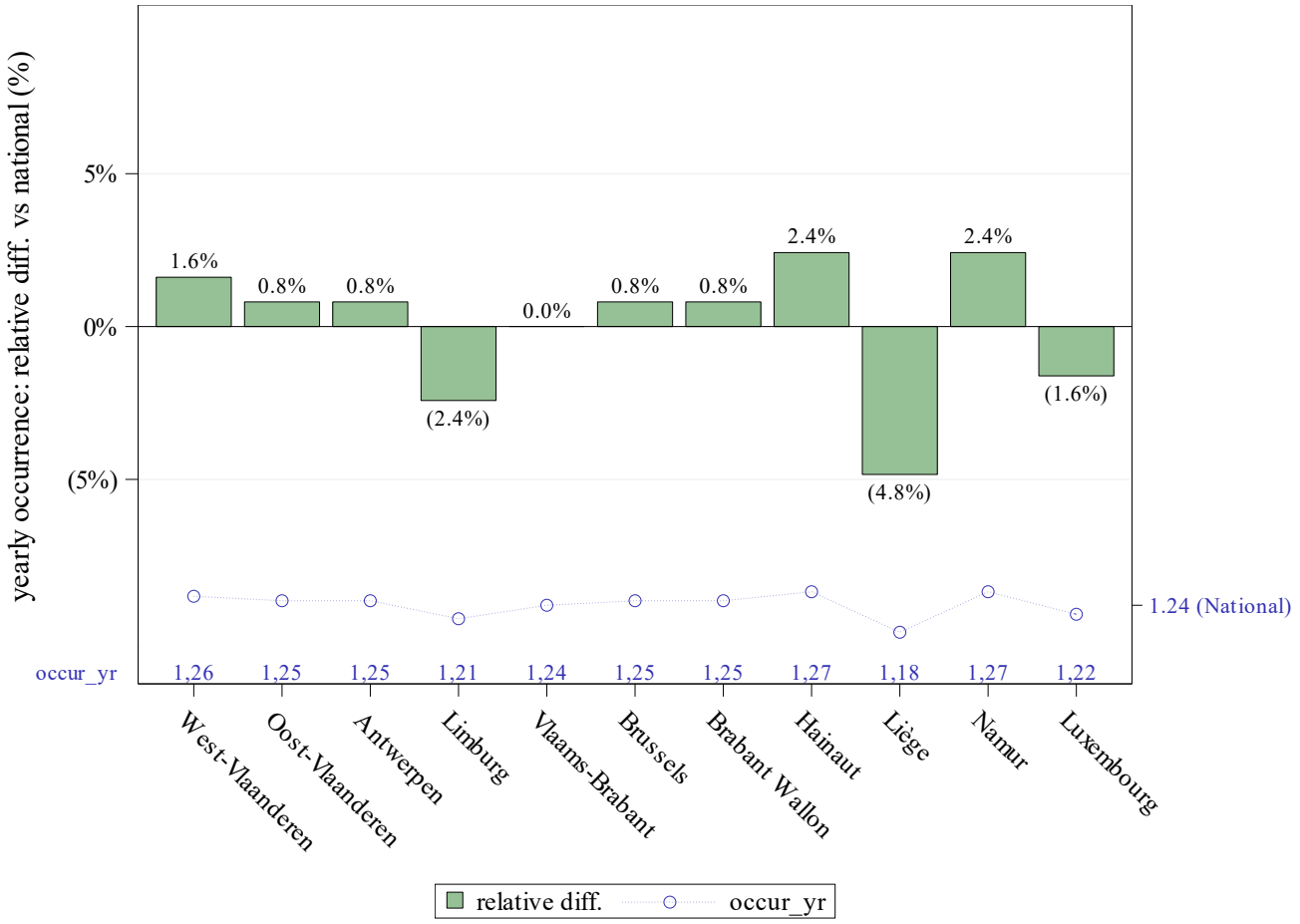



**Distribution of patients by occurrence of practice over the year (2023)**

After taking into account the occurrence per day, it is also possible for one or more services of the same practice to be charged on several different days for the same patient during the same year.

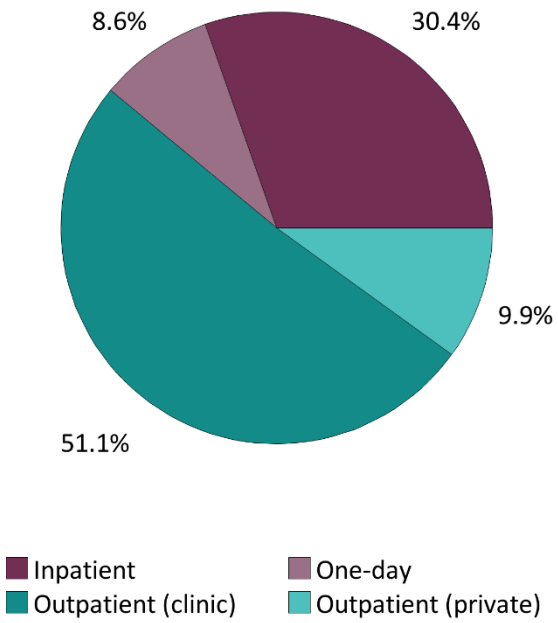
This histogram shows the distribution of patients by the occurrence of the practice over the year (which does not include the occurrence per day).

The year **2023** was taken into account to calculate the occurrence of the services (from the following databases: Documents P, ADH and SHA).




**Average number of days per patient over the year by province and variation in relation to the national average (2023)**

## C. Types of patient care

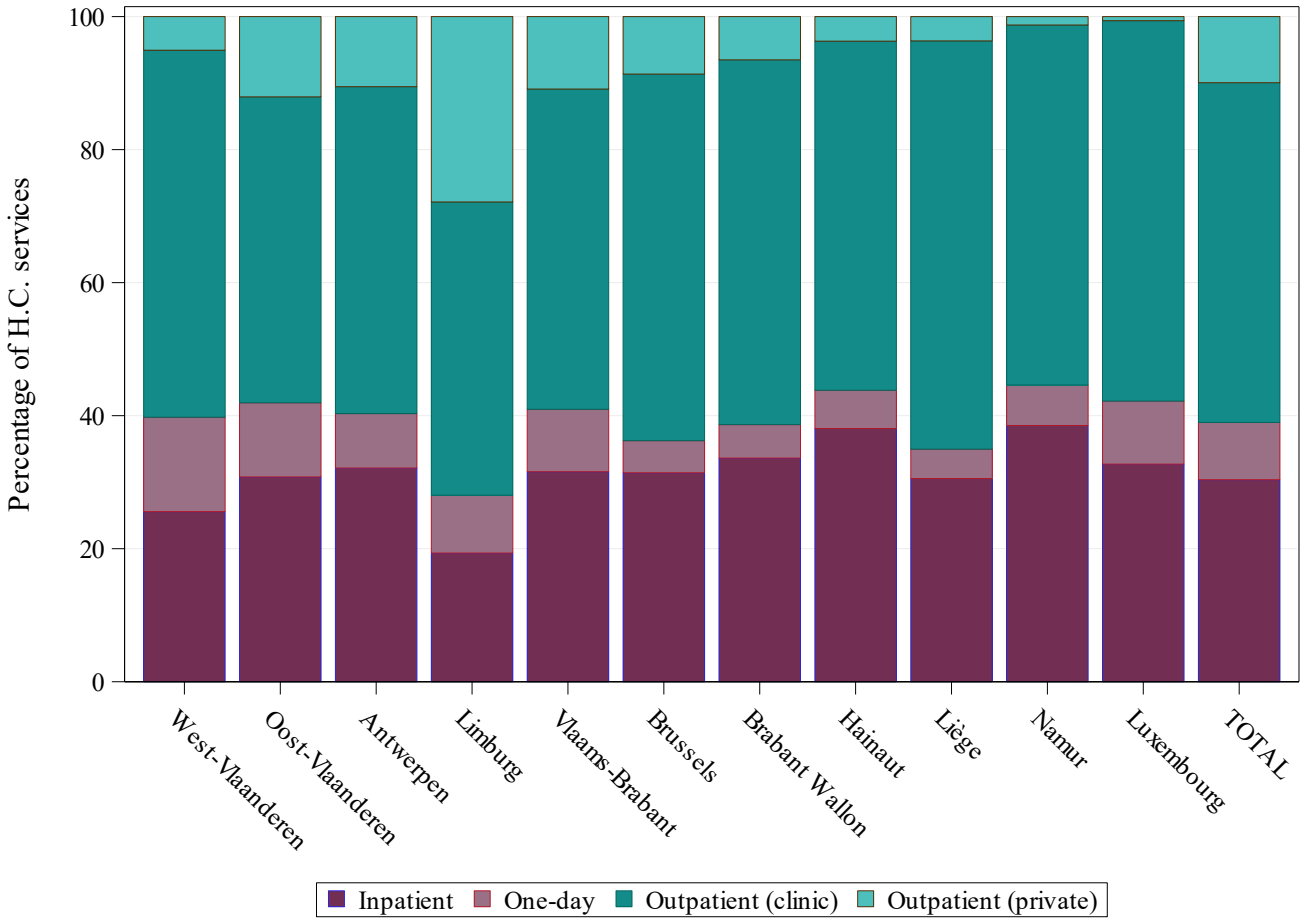



**Distribution of types of patient care in 2023**

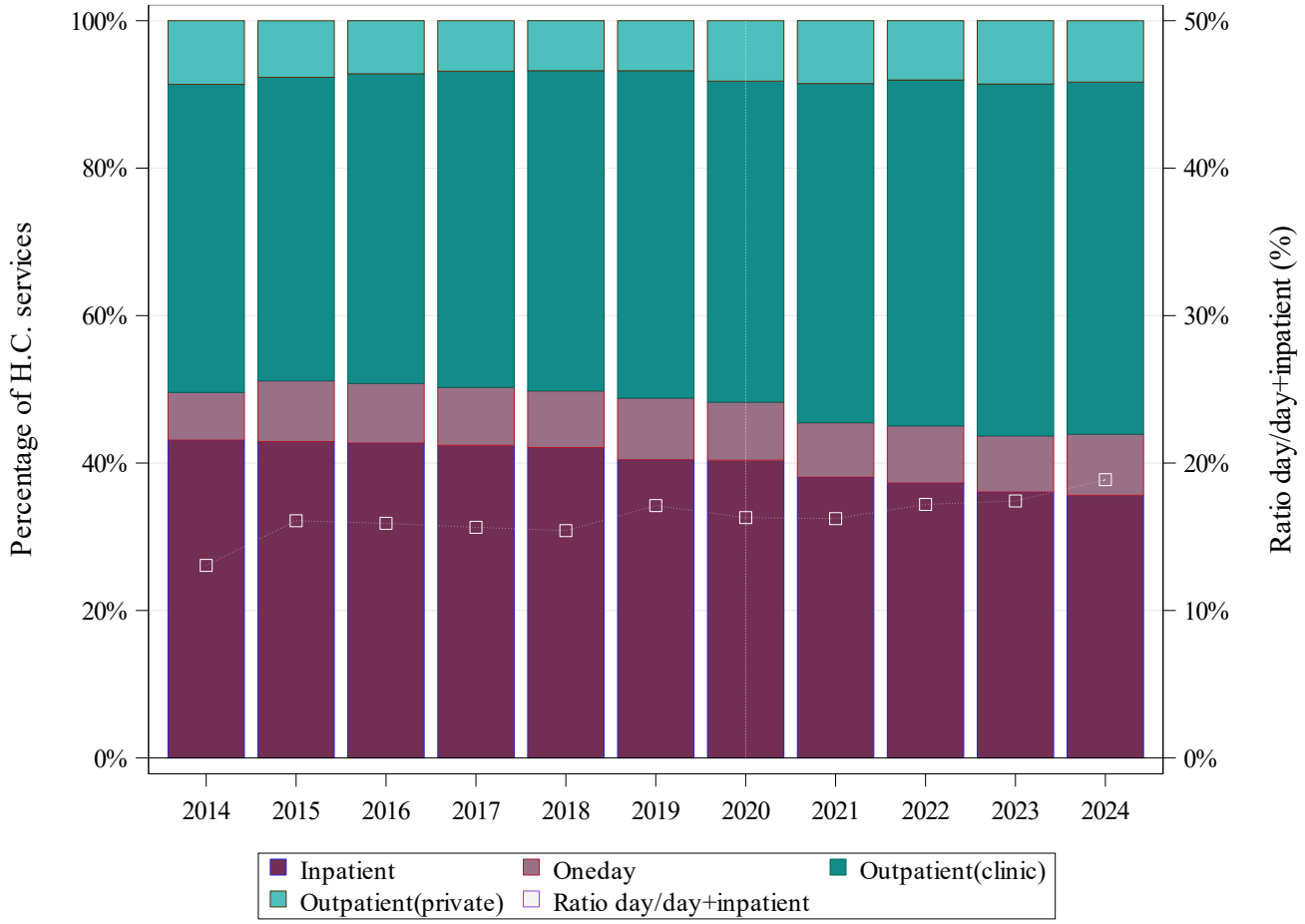
| Care Settings | |
|---|---|
| **Outpatient (private)** | 9,9% |
| **Outpatient (polyclinic)** | 51,1% |
| **(Day) Hospital** | 8,6% |
| **Hospital (stay)** | 30,4% |

In addition to the chapter on the rate of outpatient care (see p.18), the analysis of types of patient care can be refined by identifying the outpatient (private and polyclinic) and inpatient (day or standard hospitalisation) sub-sectors.

These analyses are carried out over the year **2023** using the following databases: Documents P, ADH and SHA.




**Distribution of types of patient care by province (2023)**



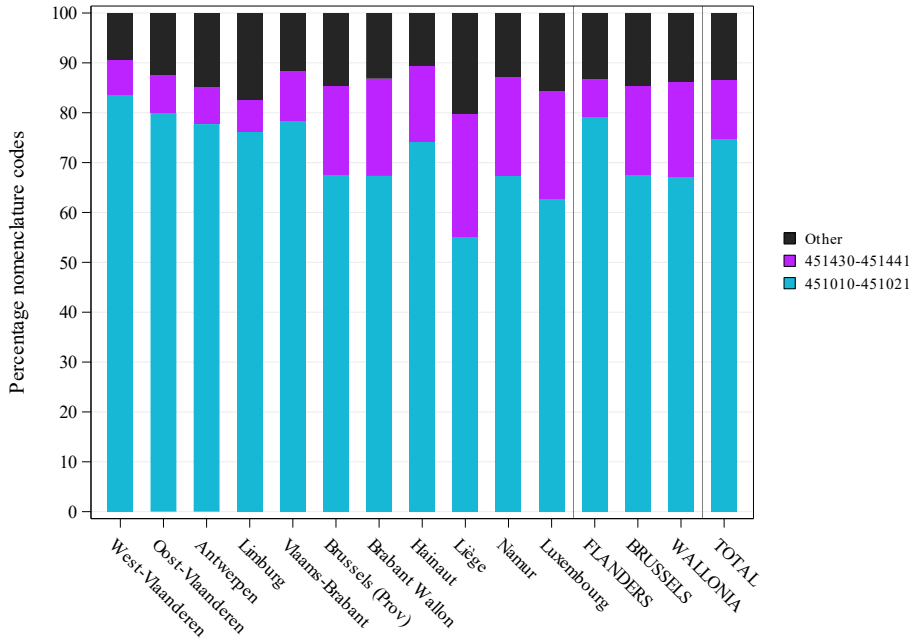

**Evolution of the distribution of types of patient care (of services), per year**

This graph illustrates the distribution of types of care by service provided, allowing their evolution to be followed over the period 2014-2024. (In the case of clinical biology services, however, outpatient types cannot be fully differentiated).

The left-hand scale refers to the distribution by sector in % (bars). Where applicable, the right-hand scale refers to the rate of day hospitalisation as a percentage of total hospitalisations (white squares).

## D. Coding variations and practice alternatives

### ➔ Variations in coding :




**Volume breakdown of nomenclature codes**

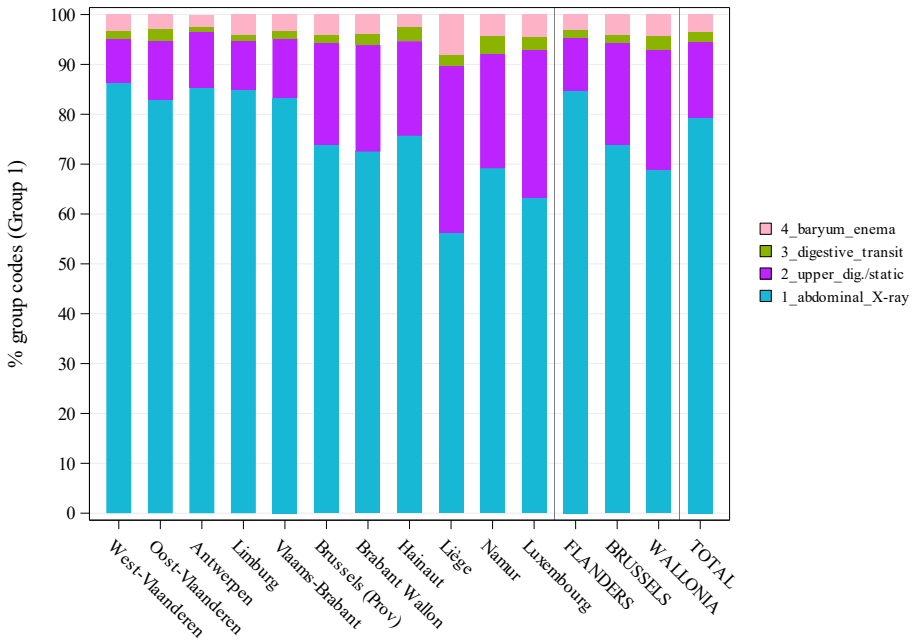
| Combined codes | Label |
|---|---|
| **Other** | Other codes |
| **451430-451441** | Radiographie de l'oesophage (minimum 4 clichés), et de l'estomac et du duodénum en série (minimum 6 clichés), avec examen radioscopique avec amplificateur de brillance et chaîne de télévision |
| **451010-451021** | Radiographie de l'abdomen et/ou de la région vésiculaire pour examen direct, sans manipulation ni moyens de contraste, quel que soit le nombre de clichés (non cumulable avec les prestations n°s 450015 - 450026, 450516 - 450520,451312 - 451323, 451356 - 451360, 451393 - 451404, 451430 - 451441, 451474 - 451485, 451511 - 451522, 451710 - 451721, 451754 - 451765, 451813 - 451824, 451894 - 451905 et 455276 - 455280 effectuées le même jour) |

| Significance | By region | By province |
|---|---|---|
| Use of **Nomenclature codes**[1] | *** | *** |

The **asterisks** represent the level of statistical significance of Chi-square test: * P-value ≤ 0,05 / ** P-value ≤ 0,01 / *** P-value ≤ 0,001. **NS** and **NA** respectively indicate that the variations are not significant or not applicable.

[1] The calculation of significance is carried out here by comparing the geographical differences in the use of the different nomenclature codes to code the practice.

➔ **Variations in practice alternative :**



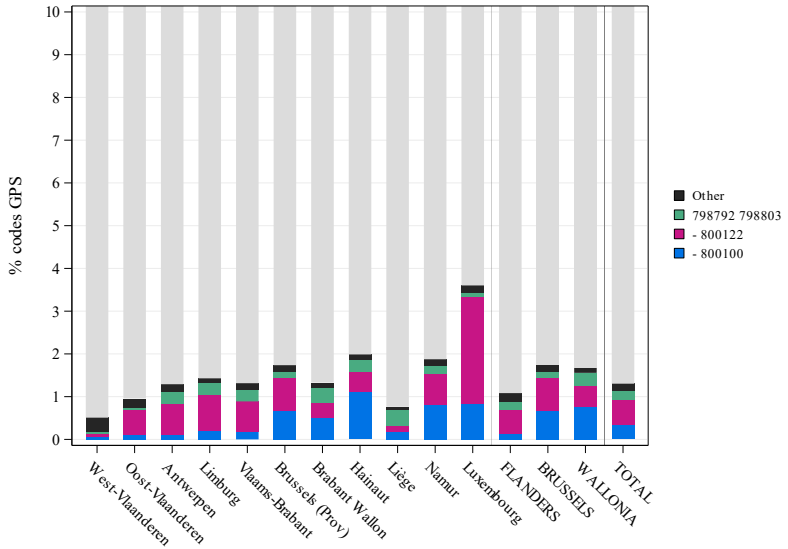

**Breakdown of choice for practice alternatives**

| Combined codes | Groupings |
|---|---|
| **451710-451721** | 4_baryum_enema |
| **451754-451765** | 4_baryum_enema |
| **462711-462722** | 4_baryum_enema |
| **462755-462766** | 4_baryum_enema |
| **451312-451323** | 3_digestive_transit |
| **451356-451360** | 3_digestive_transit |
| **451474-451485** | 3_digestive_transit |
| **451511-451522** | 3_digestive_transit |
| **462512-462523** | 3_digestive_transit |
| **451135-451146** | 2_upper_dig./static |
| **451393-451404** | 2_upper_dig./static |
| **451430-451441** | 2_upper_dig./static |
| **462431-462442** | 2_upper_dig./static |
| **450015-450026** | 1_abdominal_X-ray |
| **450516-450520** | 1_abdominal_X-ray |
| **451010-451021** | 1_abdominal_X-ray |
| **461510-461521** | 1_abdominal_X-ray |

| **Significance** | Par région | Par province |
|---|---|---|
| Choice of **Practice alternatives** | *** | *** |

According to the nature of the practice and the analytical tools available, it may be possible to identify and define alternatives for carrying out the practice. In this case, the nomenclature codes defined for the analysis of the practice are grouped together with the aim of analysing whether or not the choices of these alternatives are homogeneous across the territory. The calculation of significance displayed in the table is carried out by comparing these groups of codes with each other.

## ➔ Variation in the use of Global Payment with Standardisation (GPS) :




**Breakdown by volume of pseudocodes of GPS**

| Pseudocodes | Description |
|---|---|
| | *Grey: Services out of low-variability healthcare* |
| **Other** | Other pseudocodes of low-variability healthcare |
| **798792 798803** | Groupe des patients ayant bénéficié d'un traitement endoscopique pour lithiases urinaires ou sténose urétérale, en hospitalisation classique et de jour, de sévérité 1. |
| **800122** | Groupe des patients ayant bénéficié d'une gastroplastie de réduction associée à une dérivation biliopancréatique ou gastro-jéjunale, en hospitalisation classique, de sévérité 1 et 2. Exclusion des séjours avec un antécédent de chirurgie bariatrique. |
| **800100** | Groupe des patients ayant bénéficié d'une gastroplastie de réduction (Sleeve, Mason), en hospitalisation classique, de sévérité 1 et 2. Exclusion des séjours avec un antécédent de chirurgie bariatrique. |

| Significance | By region | By province |
|---|---|---|
| Use of **Global Payment with Standardisation**[1] | *** | *** |

[1] The calculation of significance is carried out here by comparing the use of Global Payment with Standardisation as a whole compared to the non-use of these packages.