

Medical practice variations

Biliary tract - Exploration and treatment

Analysis of the distribution and evolution of medical practice in Belgium, in terms of volume and expenditure per insured (analysis and trends by region, province and district), for the year 2019



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

Appropriate care unit

Meeus, Pascal, Virginie Dalcq and Delphine Beauport
Leon D'hulster, Lucien Hoekx, Kathleen Sierens, Benjamin Swine
Contact: appropriatecare@riziv-inami.fgov.be

Date of report: 3 August 2020

CONTENTS

CONTENTS	2
1. INTRODUCTION	3
2. SPECIFIC METHOD OF ANALYSIS	4
A. NIHDI NOMENCLATURE CODES SELECTED FOR ANALYSIS.....	4
B. PAST HISTORY OF NOMENCLATURE CODES	5
C. SOURCE OF DATA AND ANALYSIS PERIOD.....	6
D. SPECIFIC SELECTION CRITERIA	7
E. STANDARDISATION.....	7
3. RESULTS	8
A. NATIONAL STANDARDISED RATE OF USE.....	8
B. BREAKDOWN OF NOMENCLATURE CODES PROVIDED, BY VOLUME.....	9
C. SPECIALISATION OF HEALTHCARE PROVIDERS	10
D. SPECIALISATION OF PRESCRIBERS.....	11
E. STANDARDISED RATE OF USE BY GENDER AND AGE GROUP.....	12
F. STANDARDISED RATE OF USE: HOSPITAL AND OUTPATIENT CARE	16
G. STANDARDISED RATE OF USE BY REIMBURSEMENT RATE.....	18
H. TRENDS IN STANDARDISED RATES OF USE	20
I. GEOGRAPHICAL VARIATIONS IN STANDARDISED RATES OF USE	23
J. STANDARDISED HEALTHCARE EXPENDITURE BORNE BY THE INSURANCE	28
4. KEY DATA SUMMARY	31
5. APPENDICES	32
A. ANALYSIS OF VARIANCE (ANOVA).....	32
B. FREQUENCY OF PRACTICE OCCURRENCES.....	33
C. PATIENT CARE SETTINGS.....	34
D. CODING VARIATIONS AND PRACTICE ALTERNATIVES.....	35

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 2016-2018¹. 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 2016². 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 unexplained 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 analyses³ of practice in the area of Biliary tract - Exploration and treatment, 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.

¹ (Institut national d'assurance maladie-invalidité, 2016)

² (Institut national d'assurance maladie-invalidité, 2016)

³ Readers interested in the methodology used in these quantitative analyses should consult the document entitled 'Variations in practice – Methodology'.

2. 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	Inclusive	Exclusive	Label	Creation	Deletion	Group N	Value
242410	242421	yes	yes			Reconstitution par hépatico-jéjunostomie intra-hépatique pour sténose de la voie biliaire consécutive à une intervention antérieure	01-04-1985		N23	N800
242432	242443	yes	yes			Reconstitution par suture bout à bout de la voie biliaire sténosée	01-04-1985		N23	N500
451614	451625	yes	yes			Cholangiographie postopératoire, y compris l'examen sans préparation opaque, pratiqué le même jour, minimum 6 clichés	01-04-1985		N50	N80
451776	451780	yes	yes			Cholécysto et/ou cholangiographie peropératoire au cours d'une intervention chirurgicale pratiquée en salle d'opération sous anesthésie générale	01-04-1985		N50	N50
451813	451824	yes	yes			Cholangio-wirsungographie par fibro-duodénoscopie et cathétérisme des voies pancréaticobiliaires (minimum 10 clichés), non cumulable avec la prestation n° 451894-451905, effectuée le même jour	01-04-1985		N50	N175
451850	451861	yes	yes			Cholangiographie percutanée, y compris l'examen sans préparation opaque, pratiqué le même jour, minimum 3 clichés, avec examen radioscopique avec amplificateur de brillance et chaîne de télévision	01-04-1985		N50	N100
451894	451905	yes	yes			Cholangio-wirsungographie par fibro-duodénoscopie et cathétérisme des voies pancréaticobiliaires, avec papillectomie (minimum 10 clichés), non cumulable avec la prestation n° 451813-451824, effectuée le même jour	01-11-1992		N50	N200
462615	462626	yes	yes			Cholangiographie postopératoire, y compris l'examen sans préparation opaque, pratiqué le même jour, minimum 6 clichés	01-11-1994		N50	N80
462770	462781	yes	yes			Cholécysto -et/ou cholangiographie peropératoire au cours d'une intervention chirurgicale pratiquée en salle d'opération sous anesthésie générale	01-11-1994		N50	N50
462814	462825	yes	yes			Cholangio-wirsungographie par fibro-duodénoscopie et cathétérisme des voies pancréatico-biliaires (minimum 10 clichés), non cumulable avec la prestation nr 462895 - 462906, effectuée le même jour	01-11-1994		N50	N175
462851	462862	yes	yes			Cholangiographie percutanée, y compris l'examen sans préparation opaque, pratiqué le même jour, minimum 3 clichés, avec examen radioscopique avec amplificateur de brillance et chaîne de télévision	01-11-1994		N50	N100
462895	462906	yes	yes			Cholangio-wirsungographie par fibro-duodénoscopie et cathétérisme des voies pancréatico-biliaires, avec papillectomie (minimum 10 clichés), non cumulable avec la prestation 462814 - 462825, effectuée le même jour	01-11-1994		N50	N200
473395	473406	yes	yes			Insertion d'un cathéter dans les voies biliaires ou la veine porte par ponction transcutanée	01-04-1985		N42	K112
473535	473546	yes	yes			Insertion d'une endoprothèse des voies biliaires par voie percutanée	01-04-1985		N42	K225
473690	473701	yes	yes			Section du muscle sphincter de la papille duodénale, par endoscopie	01-08-1988		N42	K250
473712	473723	yes	yes			Insertion d'une prothèse dans les voies biliaires ou pancréatiques, par endoscopie	01-08-1988		N42	K400
473830	473841	yes	yes			Extraction de calcul(s) biliaire(s) ou pancréatique(s) au cours d'une cholangiopancréatographie par endoscopie	01-07-2003		N42	K350
474736	474740	yes	yes			Examen des voies biliopancréatiques par endoscopie	01-11-2016		N42	K100
474773	474784	yes	yes			Fragmentation de calcul(s) biliaire(s) ou pancréatique(s) par laser ou sonde électrohydraulique	01-11-2016		N42	K150



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.

B. Past history of nomenclature codes

Outpatient	Inpatient	Date	Label	Group N	Value
242410	242421	01-02-2016	Reconstitution par hépatico-jéjunostomie intra-hépatique pour sténose de la voie biliaire consécutive à une intervention antérieure	N23	N800
242432	242443	01-02-2016	Reconstitution par suture bout à bout de la voie biliaire sténosée	N23	N500
451614	451625	01-11-1992	Cholangiographie postopératoire, y compris l'examen sans préparation opaque, pratiqué le même jour, minimum 6 clichés	N50	N80
451776	451780	01-04-1985	Cholécysto et/ou cholangiographie peropératoire au cours d'une intervention chirurgicale pratiquée en salle d'opération sous anesthésie générale	N50	N50
451813	451824	01-11-1992	Cholangio-wirsungographie par fibro-duodénoscopie et cathétérisme des voies pancréaticobiliaires (minimum 10 clichés), non cumulable avec la prestation n° 451894-451905, effectuée le même jour	N50	N175
451850	451861	01-04-1985	Cholangiographie percutanée, y compris l'examen sans préparation opaque, pratiqué le même jour, minimum 3 clichés, avec examen radioscopique avec amplificateur de brillance et chaîne de télévision	N50	N100
451894	451905	01-11-1992	Cholangio-wirsungographie par fibro-duodénoscopie et cathétérisme des voies pancréaticobiliaires, avec papillectomie (minimum 10 clichés), non cumulable avec la prestation n° 451813-451824, effectuée le même jour	N50	N200
462615	462626	01-11-1994	Cholangiographie postopératoire, y compris l'examen sans préparation opaque, pratiqué le même jour, minimum 6 clichés	N50	N80
462770	462781	01-11-1994	Cholécysto -et/ou cholangiographie peropératoire au cours d'une intervention chirurgicale pratiquée en salle d'opération sous anesthésie générale	N50	N50
462814	462825	01-11-1994	Cholangio-wirsungographie par fibro-duodénoscopie et cathétérisme des voies pancréatico-biliaires (minimum 10 clichés), non cumulable avec la prestation nr 462895 - 462906, effectuée le même jour	N50	N175
462851	462862	01-11-1994	Cholangiographie percutanée, y compris l'examen sans préparation opaque, pratiqué le même jour, minimum 3 clichés, avec examen radioscopique avec amplificateur de brillance et chaîne de télévision	N50	N100
462895	462906	01-11-1994	Cholangio-wirsungographie par fibro-duodénoscopie et cathétérisme des voies pancréatico-biliaires, avec papillectomie (minimum 10 clichés), non cumulable avec la prestation 462814 - 462825, effectuée le même jour	N50	N200
473395	473406	01-02-2016	Cathétérisme des voies biliaires ou de la veine porte par ponction transcutanée, y compris le contrôle radioscopique	N42	K100
473395	473406	01-11-2016	Insertion d un cathéter dans les voies biliaires ou la veine porte par ponction transcutanée	N42	K112
473535	473546	01-02-2016	Mise en place d'une endoprothèse des voies biliaires par voie percutanée sous contrôle échoscopique ou radioscopique avec amplificateur de brillance et chaîne de télévision	N42	K200
473535	473546	01-11-2016	Insertion d'une endoprothèse des voies biliaires par voie percutanée	N42	K225
473690	473701	01-02-2016	Fibroduodénoscopie avec papillotomie	N42	K250
473690	473701	01-11-2016	Section du muscle sphincter de la papille duodénale, par endoscopie	N42	K250
473712	473723	01-02-2016	Placement d'une prothèse de dilatation des voies biliaires par fibroduodénoscopie	N42	K400
473712	473723	01-11-2016	Insertion d'une prothèse dans les voies biliaires ou pancréatiques, par endoscopie	N42	K400
473830	473841	01-02-2016	Cholangiowirsungographie rétrograde avec extraction de calculs cholédociens	N42	K350
473830	473841	01-11-2016	Extraction de calcul(s) biliaire(s) ou pancréatique(s) au cours d'une cholangiopancréatographie par endoscopie	N42	K350
474736	474740	01-11-2016	Examen des voies biliopancréatiques par endoscopie	N42	K100
474773	474784	01-11-2016	Fragmentation de calcul(s) biliaire(s) ou pancréatique(s) par laser ou sonde électrohydraulique	N42	K150



This table displays the historic evolution of the definitions of the NIHDI-nomenclature codes taken into account for this analysis as well as the historic evolution of their value and of group N (of the NIHDI-nomenclature). This table only displays the modifications implemented during the period 2009-2019. If no changes have taken place over this period, only the current information is shown.

C. 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 insured persons (who meet the selection criteria) whose age, sex, preferential regime and residence are known 2009-2019
Document P	for the utilisation rate and amount of expenses of insured persons (who meet the selection criteria) by type of medical specialities in 2017-2019
-	-
-	-

Analysis period	2009-2019
------------------------	-----------



'N Documents' are monthly data sent by the sickness 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.

'P Documents' are six-monthly data sent by the sickness 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.

D. Specific selection criteria

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

FILTERS APPLIED TO DATA	
Gender	Women and men
Age	All
-	-

E. Standardisation

The data are standardised before analysis per year, based on age, sex and preferential regime per arrondissement, province and region.



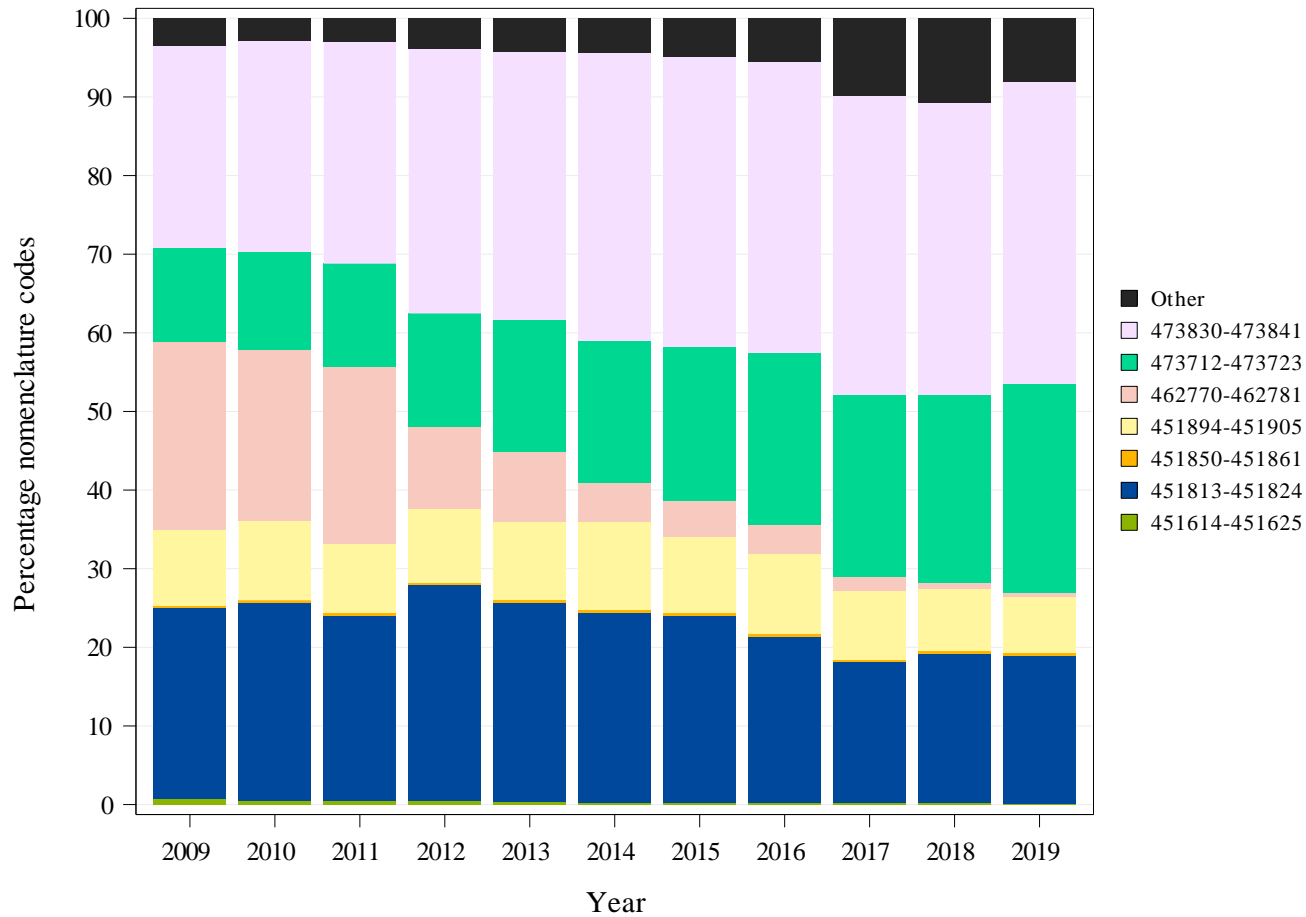
Standardisation renders populations comparable in relation to one or several criteria. If a difference is observed between these populations, we can therefore assume that it is not due to the criteria covered by the standardisation process.

3. RESULTS

A. National standardised rate of use

	TOTAL
Average number of interventions per year	25.480
Standardised rate of use per 100,000 insured persons	221

B. Breakdown of nomenclature codes provided, by volume



See page 4 for details about the NIHDI nomenclature codes selected for analysis.

C. Specialisation of healthcare providers

Specialisation of the provider	Total providers	Concerned providers	% Providers	Median of H.C. services	Number of H.C. services	% Total H.C. services	Expenses	% Expenses
Gastroenterology	740	305	41%	23	16316	64%	5.786.475,57	86%
Radiology	1609	533	33%	6	8584	33%	814.247,00	12%
General surgery	1334	87	7%	2	750	3%	94.435,26	1%
Other specialities	3513	3	0%	1	3	0%	210,10	0%
Total	7196	928	13%	8	25653	100%	6.695.367,93	100%



This table shows the following non-standardised data, by medical specialities (average figures for the period 2019):

- The number of service-providers per specialisation 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 of services per service-provider (recording provision under these codes);
- The number of services provided;
- The service percentage, i.e. the number of services recorded for this specialisation as a percentage of total services provided;
- Expenditure;
- The expenditure percentage, i.e. the expenditure on this specialisation as a percentage of total expenditure.

D. Specialisation of prescribers

Specialisation of the prescriber	Total prescribers	Concerned prescribers	% Prescribers	Median of prescriptions	Number of prescriptions	% Prescriptions	Expenses	% Expenses
Not applicable	0	0	0%	0	17197	67%	5.916.150,09	88%
Gastroenterology	836	287	34%	7	6479	25%	620.871,98	9%
Specialists in training	7833	312	4%	1	1189	5%	97.916,53	1%
General surgery	1844	108	6%	1	280	1%	15.816,51	0%
Other specialities	48482	280	1%	1	508	2%	44.612,82	1%
Total	58995	988	2%	2	25653	100%	6.695.367,93	100%



This table shows, in order, the following non-standardised data per specialities (average figures for the period 2019):

- 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 of services per prescriber (prescribing these codes);
- The number of services prescribed;
- The percentage of services prescribed, i.e. the number of prescriptions issued for this specialisation as a percentage of total services prescribed;
- Expenditure;
- The expenditure percentage, i.e. expenditure on this specialisation as a percentage of total expenditure.

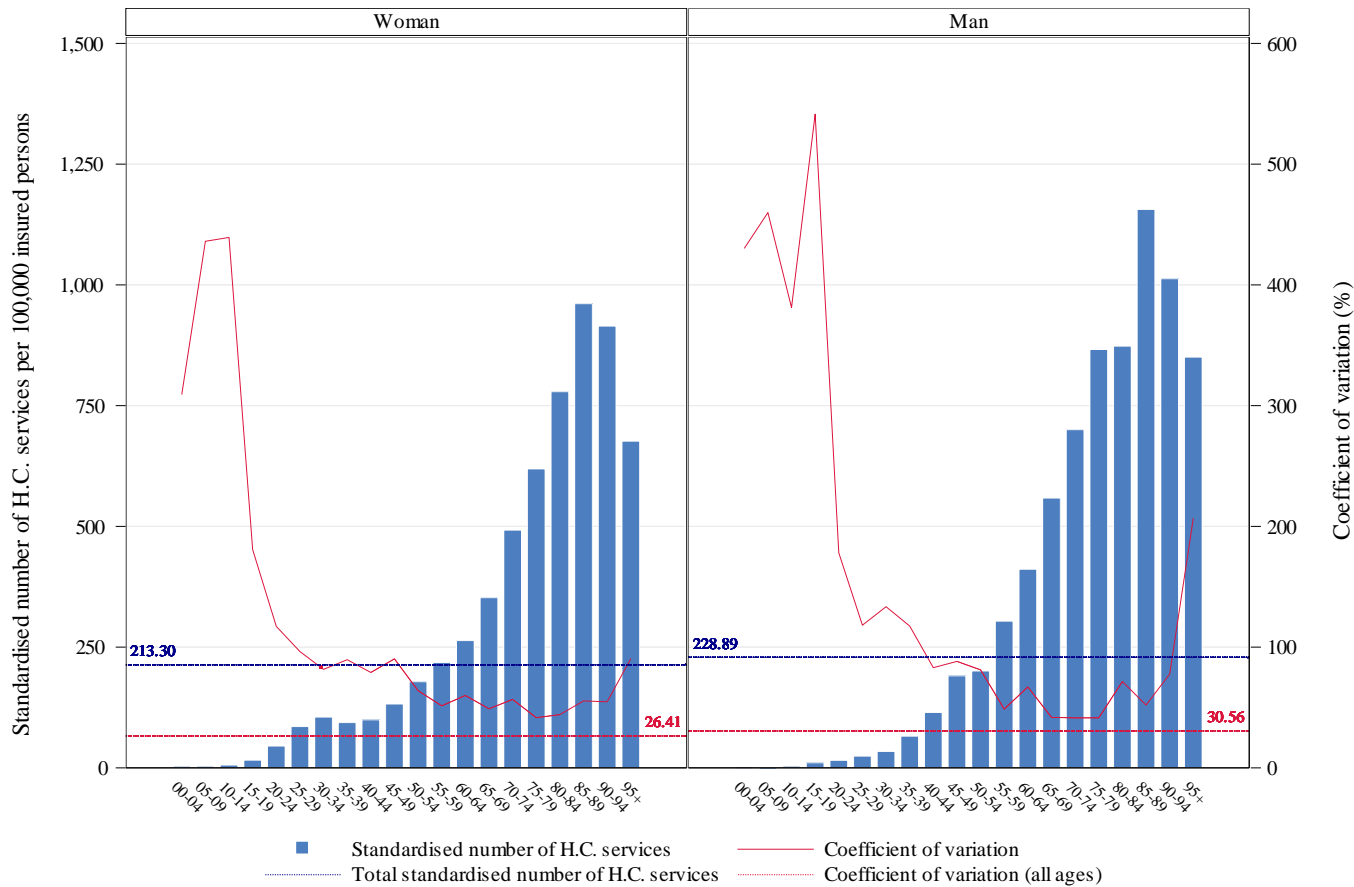
E. Standardised rate of use by gender and age group

	TOTAL
<i>Average number of interventions per year</i>	25.480
Median age (years)	70
Mean age (years)	67,11
Max/Min Ratio of the median age (by district)	1,22
Percentage of women	49,18%

Max/Min Ratio:

The max/min ratio measures the dispersion of values. It is calculated as the ratio of the maximum value found for the variable, in all districts, to the minimum value. If this minimum value is equal to zero, the max/min ratio cannot be calculated, and should be given as 'NA' ('not applicable').

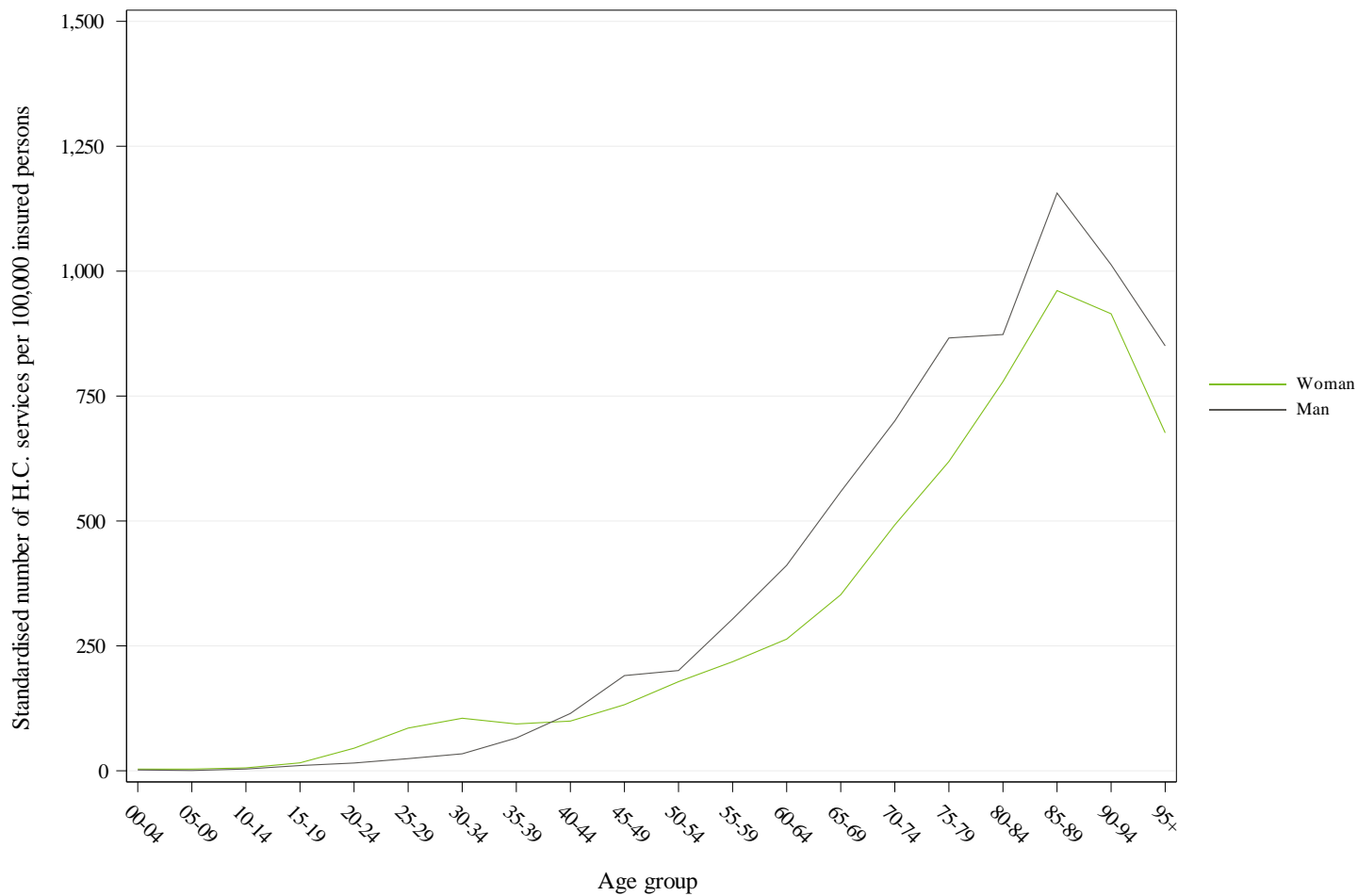
Gastroenterology - Biliary tract - Exploration and treatment



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

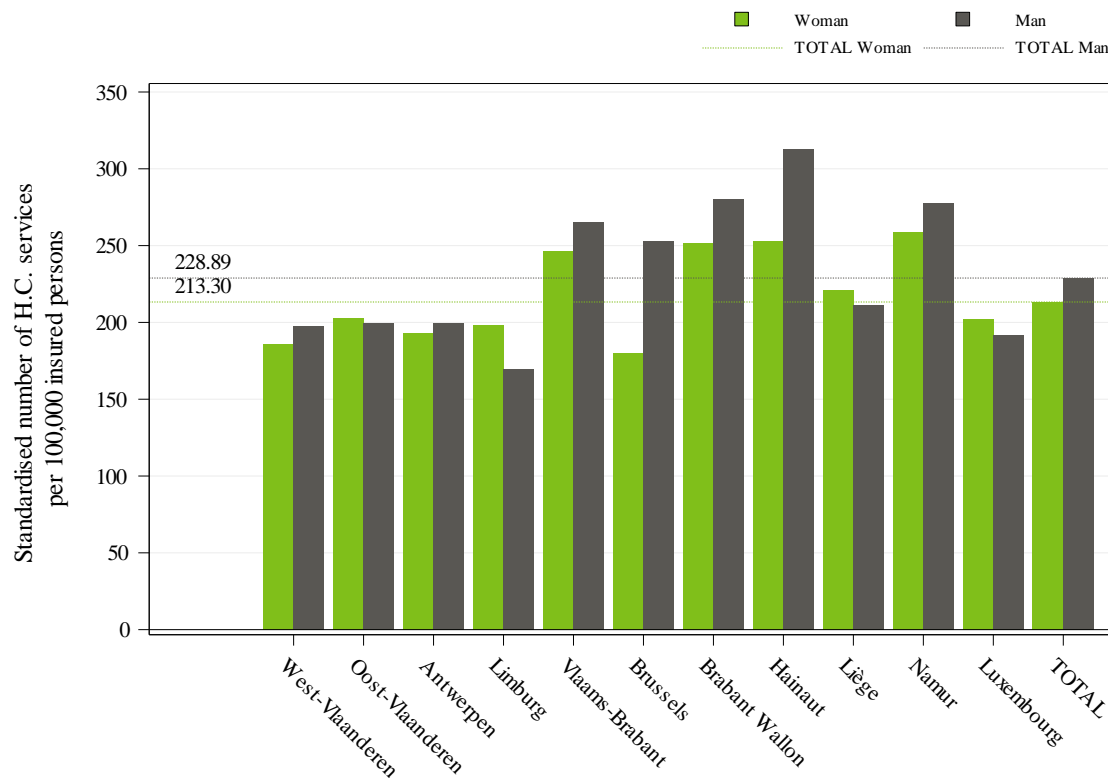
The left-hand vertical axis of the graph plots the standardised rate of use, and the right-hand axis plots the variation coefficient. The horizontal axis shows the division by age group. The horizontal dotted lines show the total values of the standardised rates of use (in blue) and of the variation coefficient (in red).

Standardised rate of use per 100,000 insured persons, and variation coefficient for the districts, by age group and gender, for the year 2019



Comparison of the standardised rates of use for women and men (per 100,000) in 2019

Gastroenterology - Biliary tract - Exploration and treatment

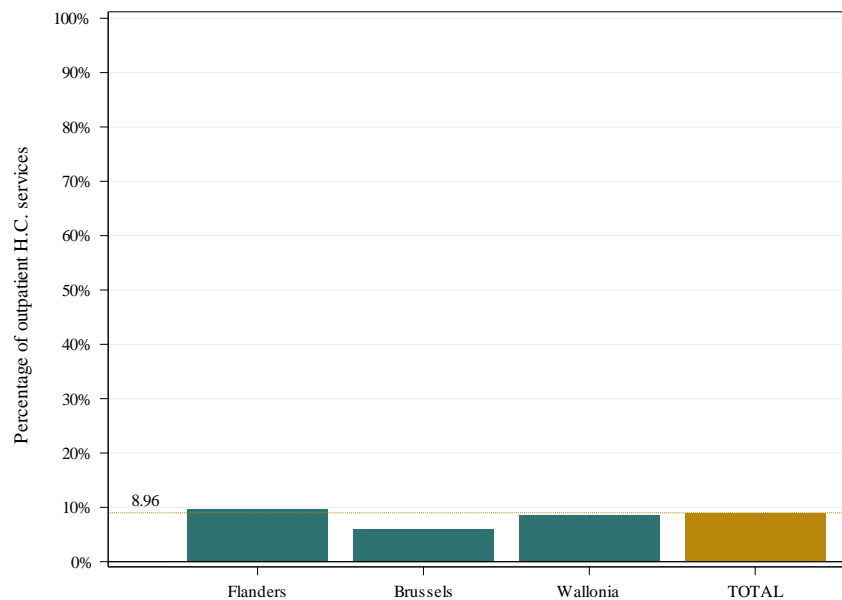


This histogram shows standardised rates of use by province and by gender. The grey bars show the rates for men, while the green bars show the rates for women, for each province. The grey and green broken lines show the total standardised rates of use, again grey for men, green for women.

Standardised rate of use per 100,000 insured persons, by gender and by province for the year 2019

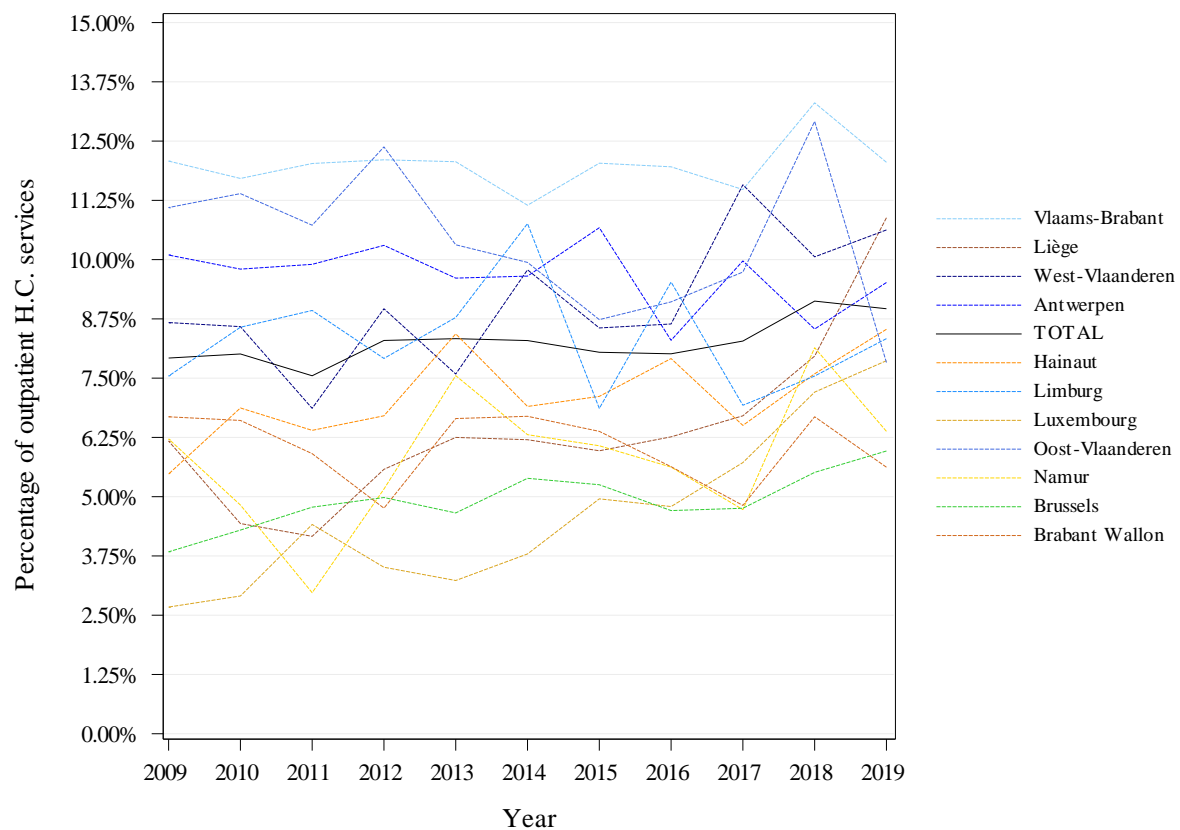
F. Standardised rate of use: hospital and outpatient care

	TOTAL
<i>Average number of interventions per year</i>	25.480
Percentage of out-patient care	8,96%
Max/min ratio of out-patient care percentage (by district)	11,68



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). As well as one bar per region, there is a bar for the whole Belgian population. A dotted line also shows this overall ratio.



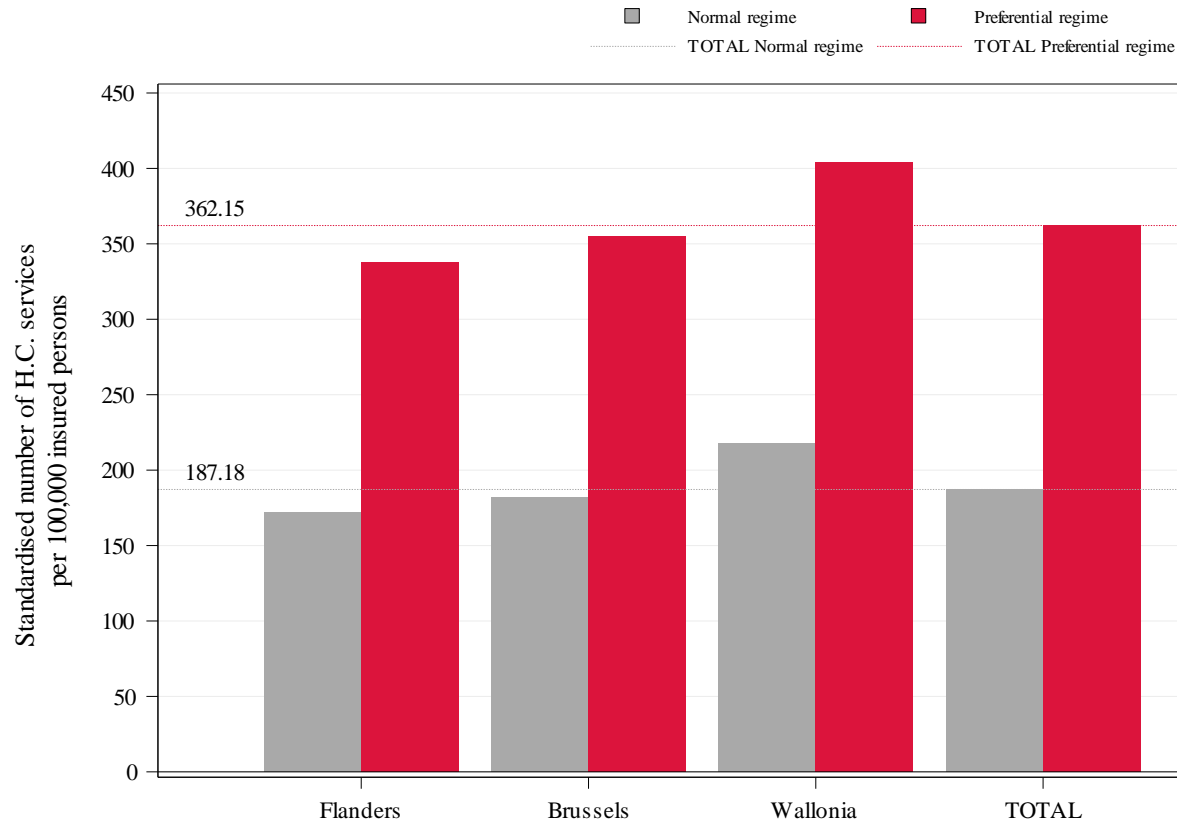
Change over time in the percentage of outpatient care, by province

N.B.: A complementary document to this chapter, about the handling of patients per health care sector, is enclosed in this report (cf. page 34).

G. Standardised rate of use by reimbursement rate

	TOTAL
<i>Average number of interventions per year</i>	25.480
Percentage provided under the preferential reimbursement rate	31,64%
Standardised rate of use with preferential reimbursement rate (per 100,000)	362
Standardised rate of use without preferential reimbursement rate (per 100,000)	187
Ratio Preferential rate /General rate	1,93

Gastroenterology - Biliary tract - Exploration and treatment

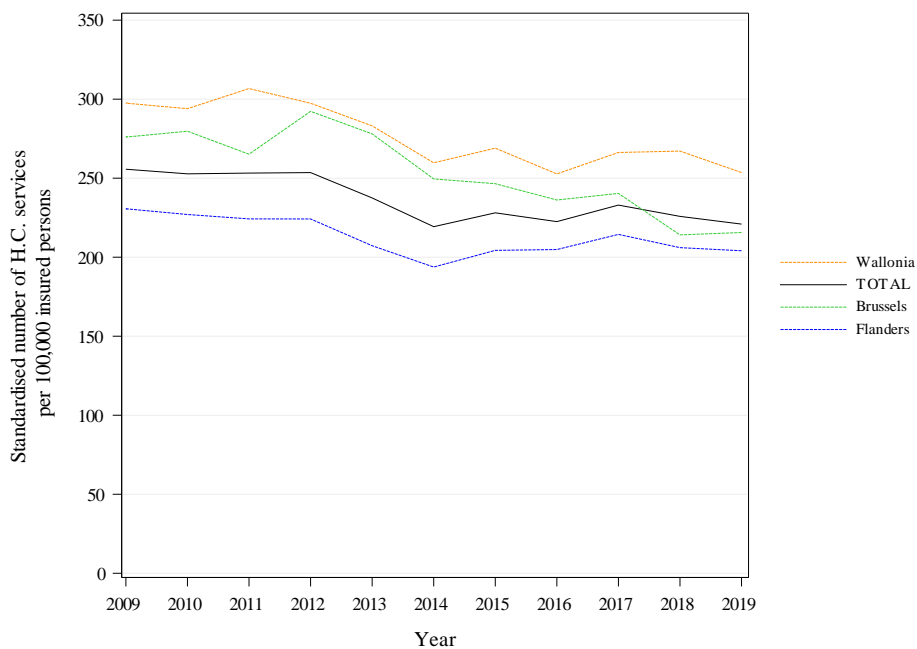


Standardised rate of use by reimbursement rate and by region

This graph shows the standardised rates of use with (in red) and without (in grey) the preferential reimbursement rate, by region and in total. The red and grey dotted lines show the overall standardised rates of use, with and without the preferential reimbursement rate, respectively.

H. Trends in standardised rates of use

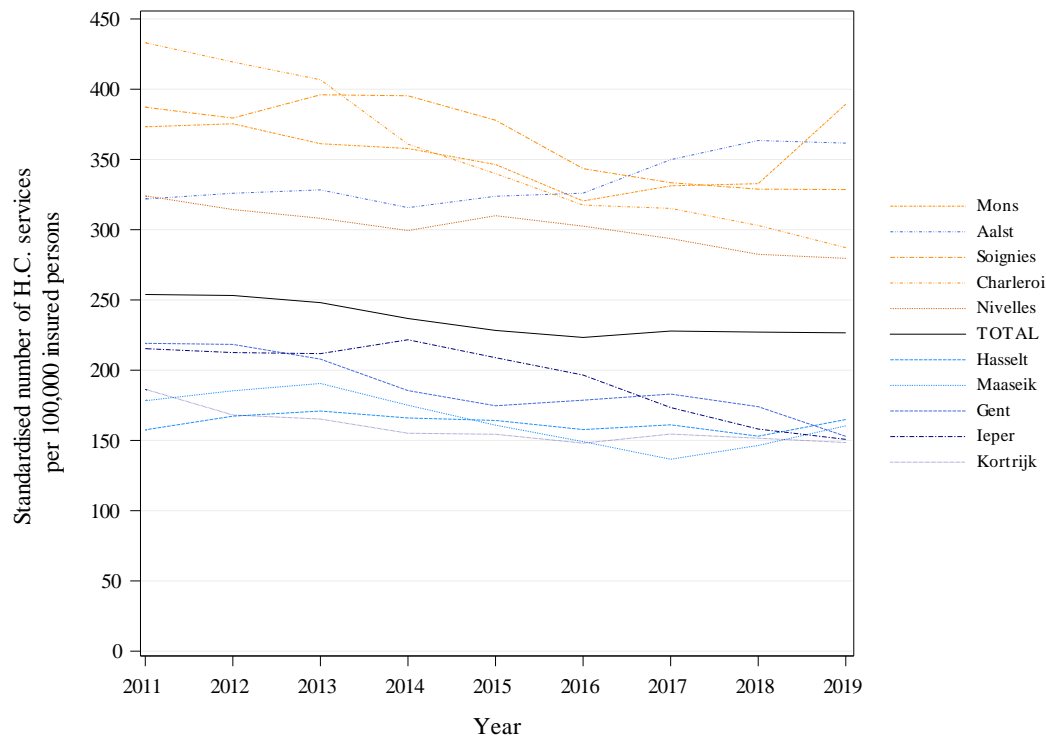
	TOTAL
<i>Average number of interventions per year</i>	25.480
Trend (2009-2019)	-1,45%
Trend (2017-2019)	-2,62%



This graph shows a coloured curve for each region and a black curve for the whole Belgian population. The x-axis shows the years, and the y-axis shows the standardised rate of use per 100,000 insured persons.

Trends in the standardised rate of use per 100,000 insured persons, by region

Gastroenterology - Biliary tract - Exploration and treatment



Trends in the standardised rate of use per 100,000 insured persons, by district

This graph shows a coloured line for each district and a black line for the whole Belgian population. The x-axis shows the years, and the y-axis shows the standardised rate of use 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.

		Rate of use	Annual increase		
		2019 (per 10 ⁵ insured)	2009- 2019	2017- 2019	Structural break
Provinces	West Flanders	191,57	-1,77%	-5,03%	
	East Flanders	201,38	-1,89%	-7,35%	***
	Antwerp	196,32	-1,62%	-4,91%	**
	Limburg	184,27	1,58%	12,03%	***
	Flemish Brabant	255,46	-0,52%	2,68%	
	Brussels	215,63	-2,44%	-5,28%	
	Walloon Brabant	265,47	-1,85%	-3,39%	
	Hainaut	282,34	-2,75%	-3,66%	
	Liège	216,34	-0,21%	-6,57%	**
	Namur	267,94	0,85%	15,39%	***
	Luxembourg	196,97	-4,41%	-	*
Regions	Flanders	204,08	-1,22%	-2,44%	
	Brussels	215,63	-2,44%	-5,28%	
	Wallonia	253,57	-1,58%	-2,41%	
TOTAL		220,95	-1,45%	-2,62%	*

Trends in the rates of use, by province and region

This table shows the standardised **rates of use** (or of intervention) for the last year analysed (2019), but also the average **rates of increase**, by province, by region and in total, for the longer period (2009-2019) and the shorter period (2017-2019).

The **statistical significance** has been calculated to show whether the change in data over the last three years of the period analysed differs from the change over the whole period, by province and by region. **Linear regressions** have therefore also been used. This method calculates a regression line by period studied (2009-2019 and 2017-2019). The slope of this line is the **regression coefficient**. The statistical significance reflects the size of the difference between the regression coefficients in the various periods analysed, i.e. whether or not trends have changed.

The asterisks show the level of statistical significance of the data observed, with the following values: * Value from $p \leq 0.05$ / ** Value from $p \leq 0.01$ / *** Value from $p \leq 0.001$. If there is no asterisk, the trend observed is not statistically significant.

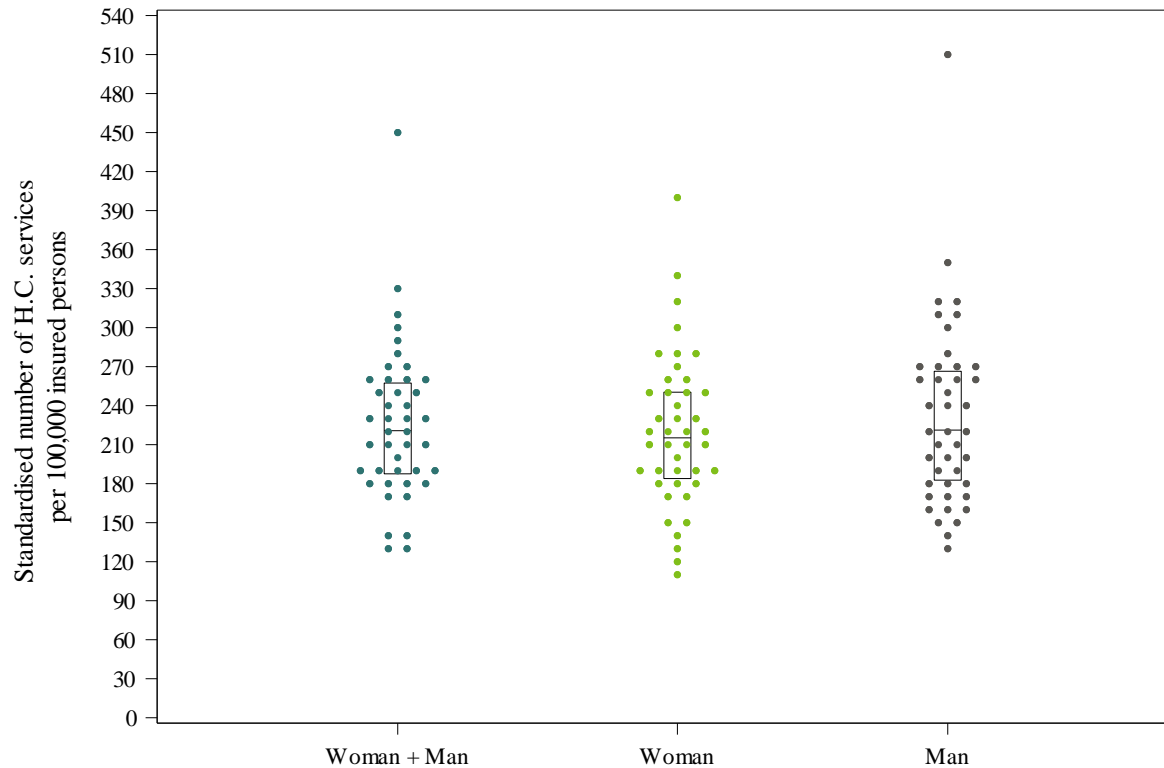
'NA' is shown where the nomenclature codes selected for the analysis have not been used for the whole of the three-year period.

I. Geographical variations in standardised rates of use

	TOTAL
<i>Average number of interventions per year</i>	25.480
Coefficient of Variation (2019)	26,09
Max/Min Ratio* of the standardised rates of use (by region)	1,24
Max/Min Ratio* of the standardised rates of use (by district)	3,49

Coefficient of Variation (2017-2019)	21,97
Coefficient of Variation (2009-2011)	24,2
<i>Statistically significant difference? (p-value)</i>	<i>No</i>

* An 'NA' result indicates a ratio which cannot be calculated, i.e. the minimum value = zero (cf. E. Standardised rate of use by gender and age group)

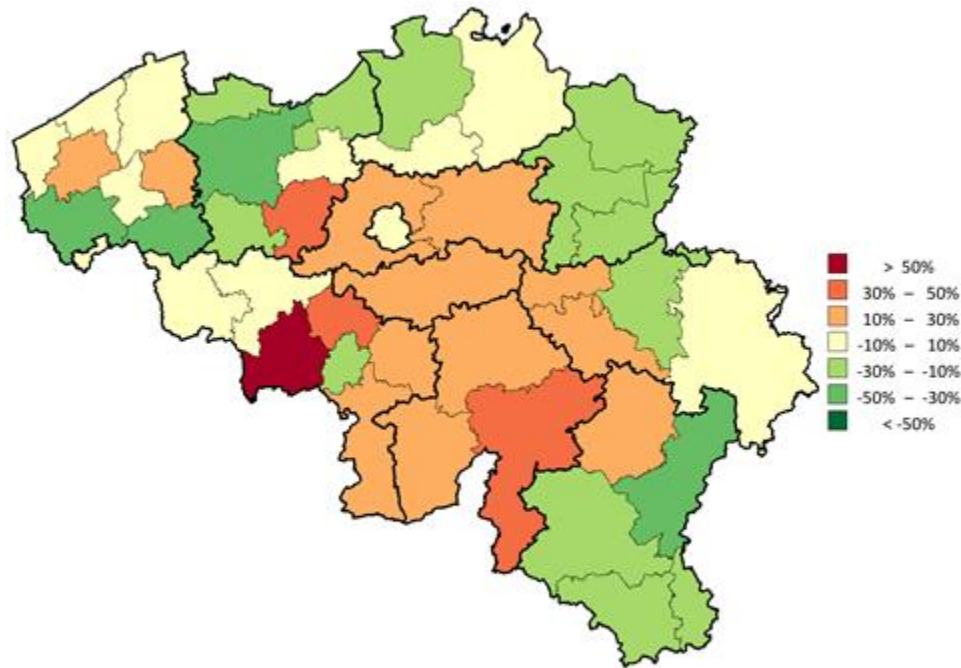


'Dot plot' showing standardised rates of use by district, by gender

A **dot plot** is a distribution chart, which is useful for highlighting grouped data, gaps in distribution and outlying values. Here, each dot represents the rate of use of a district, for its whole population or broken down by gender.

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.

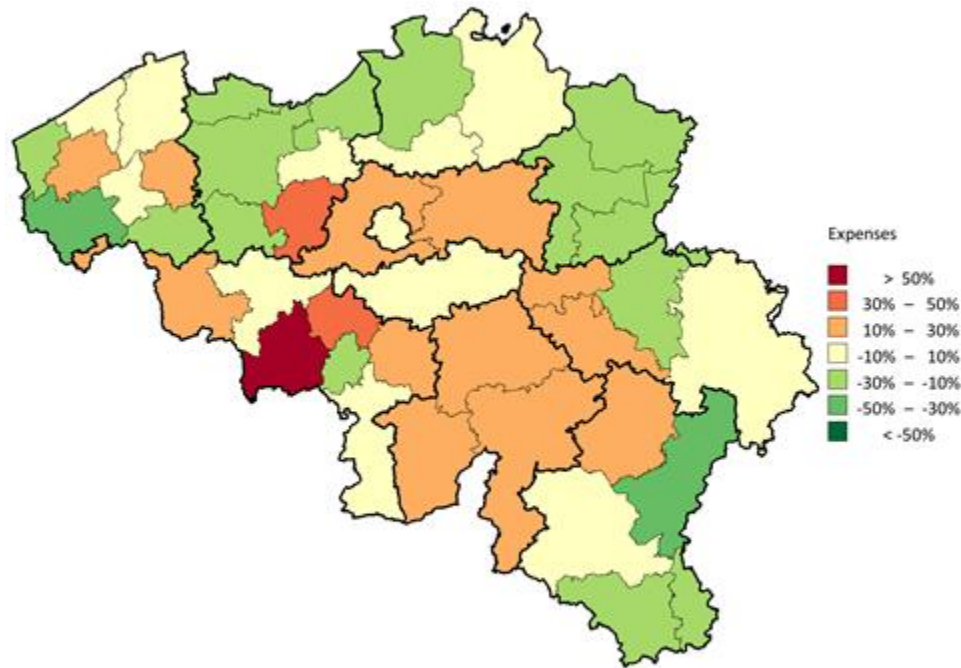
The graph also shows, as 'boxes', the 25th, 50th and 75th percentiles of the non-rounded standardised rates of use for all patients. The bottom line of the box represents the 25th percentile, while the upper line represents the 75th percentile. The line inside the box represents the 50th percentile.



Map showing distribution of standardised rates of use, by district

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 rate of use in the district compared to the Belgian average. This comparison 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 total rate, and -20% if the rate is 20% below the overall rate. The percentages are calculated using the mean standardised rate of use of the last three years, and are displayed in bands of 20%. The following colour coding applies:

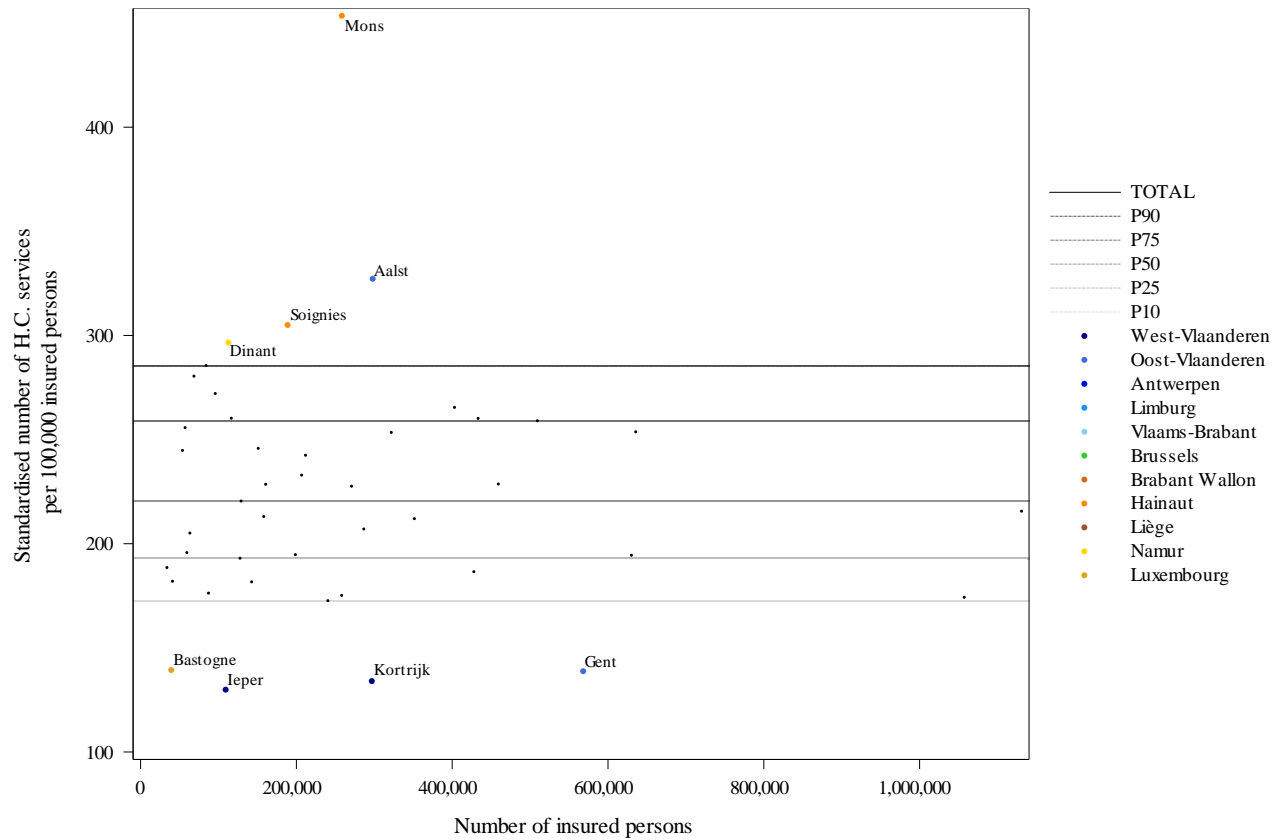
Colour	Category
Dark Red	More than 50%
Red	Between 30% and 50%
Orange	Between 10% and 30%
Yellow	Between -10% and 10%
Light Green	Between -30% and -10%
Green	Between -50% and -30%
Dark Green	Less than -50%
White	No use made



Map showing distribution of standardised expenditure, by district

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 in the district compared to Belgian average expenditure. This comparison 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 mean standardised expenditure for the last three years and are displayed in bands of 20%. The following colour coding applies:

Colour	Category
Dark Red	More than 50%
Red	Between 30% and 50%
Orange	Between 10% and 30%
Yellow	Between -10% and 10%
Light Green	Between -30% and -10%
Green	Between -50% and -30%
Dark Green	Less than -50%
White	No expenditure



'Funnel plot' showing the distribution of standardised rates of use by district, by number of insured persons

In this graph, the standardised rate of use in a district is placed according to the size of its population. As well as the dots for districts, the **confidence intervals** (expected variation in the standardised rate of use when the only source of variation is random) are also shown on the graph (horizontal percentile lines). These are independent of the size of the districts. The thicker horizontal line shows the national standardised rate of use. The outlier districts are indicated by values above P90 and below P10.

As long as the practice analysed only occurs once per year per insured, this graph can also be interpreted as a **funnel plot**. The confidence levels here are typically shaped like a funnel: for small population-sizes, the expected variation is larger than for districts that are more populous. The curves shown by broken lines represent the 95% and 99.7% confidence intervals. The districts situated beyond the upper and lower limits of the 99.7% confidence levels are defined as **'outliers'**

J. Standardised healthcare expenditure borne by the insurance

	TOTAL
<i>Average number of interventions per year</i>	25.480
Average annual expenditure (€)	6.652.448
Average cost per intervention (€)	261,09
Average annual expenditure per insured (€)	0,58
Max/Min Ratio* of expenditure per insured (by region)	1,16
Max/Min Ratio* of expenditure per insured (by district)	2,82

* An 'NA' result indicates a ratio which cannot be calculated, i.e. the minimum value = zero (cf. E. Standardised rate of use by gender and age group)

		Standardised expenditure (per insured)	
Provinces	West Flanders	0,53 €	
	East Flanders	0,53 €	
	Antwerp	0,54 €	
	Limburg	0,51 €	
	Flemish Brabant	0,64 €	
	Brussels	0,57 €	
	Walloon Brabant	0,6 €	
	Hainaut	0,7 €	
	Liège	0,57 €	
	Namur	0,68 €	
	Luxembourg	0,53 €	
	Regions	Flanders	0,55 €
		Brussels	0,57 €
Wallonia		0,64 €	
TOTAL		0,58 €	

Regional and provincial distribution of standardised expenditure (2019)

Gastroenterology - Biliary tract - Exploration and treatment

Nomenclature	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Average annual growth rate
242410-242421	1.081,07	1.154,16	1.126,33	1.146,99	1.178,81	1.213,18	1.179,01	1.206,26	1.200,28	1.216,90	1.229,58	1,30%
242432-242443	559,73	537,77	574,86	555,34	597,36	585,13	609,16	567,41	618,66	608,85	629,09	1,17%
451614-451625	38,58	39,19	39,39	39,81	39,47	40,05	40,13	40,11	40,08	40,54	40,64	0,52%
451776-451780	24,01	24,42	24,64	24,92	24,71	25,08	24,94	25,12	25,11	25,41	25,29	0,52%
451813-451824	95,07	96,52	96,96	97,98	97,17	98,66	98,86	98,87	98,88	99,93	99,53	0,46%
451850-451861	48,30	48,92	49,26	49,85	49,36	50,11	50,22	50,22	50,23	50,77	50,85	0,52%
451894-451905	96,66	98,04	98,49	99,57	98,80	100,27	100,50	100,49	100,49	101,53	101,07	0,45%
462615-462626	38,52	38,90	39,06	39,60	39,17	39,62	39,45	39,75	39,42	39,55	40,10	0,40%
462770-462781	24,18	24,50	24,63	24,91	24,68	25,07	25,13	25,12	25,13	25,35	18,24	-2,78%
462814-462825	95,01	96,55	96,98	97,84	97,28	98,77	98,93	98,93	98,94	99,92	100,06	0,52%
462851-462862	48,17	48,65	49,13	49,55	49,37	50,07	50,25	50,25	50,24	50,75	50,84	0,54%
462895-462906	96,61	98,12	98,58	99,52	98,87	100,34	100,51	100,52	100,52	101,60	100,52	0,40%
473395-473406	124,97	127,18	128,25	130,20	131,42	133,46	133,59	133,91	132,69	135,83	136,04	0,85%
473535-473546	253,64	255,43	258,45	263,47	266,69	269,29	271,51	270,19	266,10	272,84	273,64	0,76%
473690-473701	279,77	284,62	286,72	291,52	293,60	298,23	298,08	299,33	295,59	303,38	303,59	0,82%
473712-473723	451,75	454,74	455,92	462,56	467,45	474,64	475,54	475,65	472,41	485,64	485,33	0,72%
473830-473841	393,52	397,98	399,15	407,43	410,51	416,42	417,05	416,67	413,21	424,61	419,56	0,64%
474736-474740	0,00	0,00	0,00	0,00	0,00	0,00	0,00	118,89	118,16	121,33	121,79	0,81%
474773-474784	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	177,20	182,37	182,51	1,49%

Change over time in expenditure, by service and by nomenclature code

4. KEY DATA SUMMARY

		TOTAL
PROVIDERS & PRESCRIBERS		
Main healthcare providers:	<i>Gastroenterology</i>	64,00%
Main prescribers:	<i>Not applicable</i>	-
RATE OF USE		
Average number of interventions (per year)		25.480
Standardised rate of use (per 100,000 insured persons)		220,95
≥ 2 occurrences per patient (2018) ⁴		72.0%
Percentage of outpatient care		8,96%
POPULATION		
Median age		70 years
Max/min ratio ⁵ of the median age (by district)		1,22
Percentage of women ⁶		49,18% *
Ratio Preferential rate/General rate ⁶		1,93 ***
TRENDS		
Trend ⁶ (2009-2019)		-1,45% *
Trend ⁶ (2017-2019)		-2,62% *
GEOGRAPHICAL VARIATIONS		
Coefficient of variation ⁶ (2009-2011)		24,2
Coefficient of variation ⁶ (2017-2019)		21,97 NS
Max/min ⁵ Ratio of number of interventions ⁶ (per 100,000 insured persons, by region)		1,24 ***
Max/Min Ratio ⁵ of number of interventions (per 100,000 insured persons, by district)		3,49
DIRECT EXPENDITURE		
Average annual expenditure		6.652.448 €
Average annual expenditure per insured		0,58 €
Max/Min Ratio ⁵ of expenditure per insured (by region)		1,16
Max/Min Ratio ⁵ of expenditure per insured (by district)		2,82
Average cost of interventions		261,09 €
CODING VARIATIONS & PRACTICE ALTERNATIVES⁴		
Variations in practice coding ⁶ (by province)		Yes ***
Variations in the choice of practice alternatives ⁶ (by province)		Yes ***

⁴ More detailed results are shown in a document enclosed to this report.

⁵ An 'NA' result indicates a ratio, which cannot be calculated, i.e. the minimum value equals zero.

⁶ If the result(s) show(s) a significant difference, the level of statistical significance is symbolized by one to three asterisks (increasingly significant). Otherwise, NS is displayed (not significant).

5. APPENDICES

A. Analysis of variance (ANOVA)

Statistical significance of the differences observed in 2019		
<i>By region?</i>	Yes	***
<i>By gender?</i>	Yes	*
<i>By reimbursement scheme?</i>	Yes	***
<i>By gender and per region?</i>	No	
<i>By reimbursement scheme and per region?</i>	No	
<i>By gender and per reimbursement scheme?</i>	No	
<i>By gender and reimbursement scheme and per region?</i>	No	

In order to be able to assess the significance of the observed differences, an **ANOVA analysis** can be carried out.

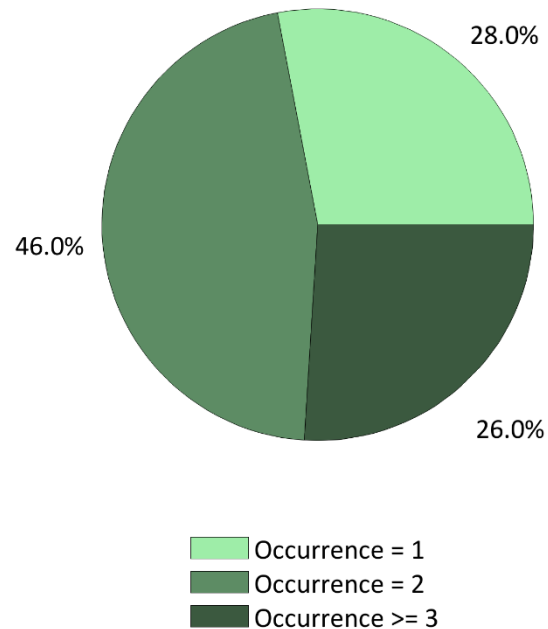
The ANOVA analysis applied here examines each **factor** separately (region, gender and reimbursement scheme). The **statistical significance** of the observed differences in the rate of use for each of these three factors is therefore first assessed separately.

On the other hand, the analysis is also applied in a **multifactorial** way, crossing two or three factors, in order to identify possible significant differences that are more specific. For example, are there significant differences in the rate of use by gender at the regional level?

The **asterisks** represent the level of statistical significance of the observed data with the following values: * Value threshold of $p \leq 0,05$ / ** Value threshold of $p \leq 0,01$ / *** Value threshold of $p \leq 0,001$. The absence of an asterisk indicates that the difference observed is statistically insignificant.

B. Frequency of practice occurrences

Frequency	Per year	Per day
2 occurrences	46.0%	62.0%
≥ 3 occurrences	26.0%	6.7%
≥ 2 occurrences	72.0%	68.6%



Distribution of practice recurrences per year (2018)

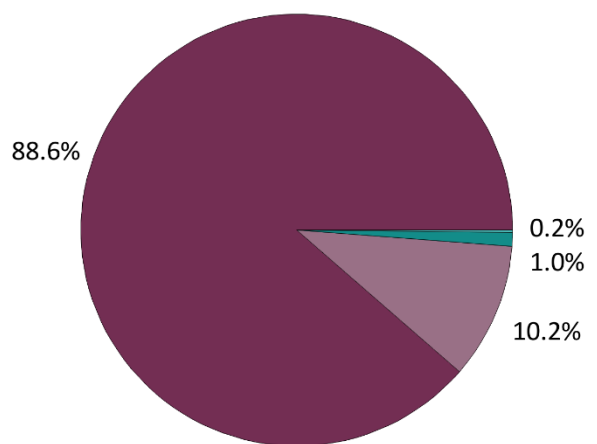
Some practices may be billed several times for the same patient in the same year or even on the same day. This may be due to a **repetition of the practice**, but also to an anatomical effect, which may lead, depending on the organ concerned, to performing the same practice **bilaterally**, which may therefore cause a double occurrence on the same day.

In order to interpret the results per day validly, it is useful to note that the same patient may be counted several times if, for example, he or she has received two identical services simultaneously, twice a year.

These frequency analyses of occurrences are carried out over the year **2018** using the following databases: Documents P, ADH and SHA.

Values « **n.a.** » are indicated if the data were not available at the time of this report.

C. Patient care settings



Inpatient
 One-day
 Outpatient (clinic)
 Outpatient (private)

Distribution of patient care settings in 2018

Care Settings	
Outpatient (private)	<i>0.2%</i>
Outpatient (polyclinic)	<i>1.0%</i>
(Day) Hospital	<i>10.2%</i>
Hospital (stay)	<i>88.6%</i>

In addition to the chapter on [standardised inpatient and outpatient use rates \(see page 16\)](#), the analysis of patient care settings 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 **2018** using the following databases: Documents P, ADH and SHA.

Values « **n.a.** » are indicated if the data were not available at the time of this report.

D. Coding variations and practice alternatives

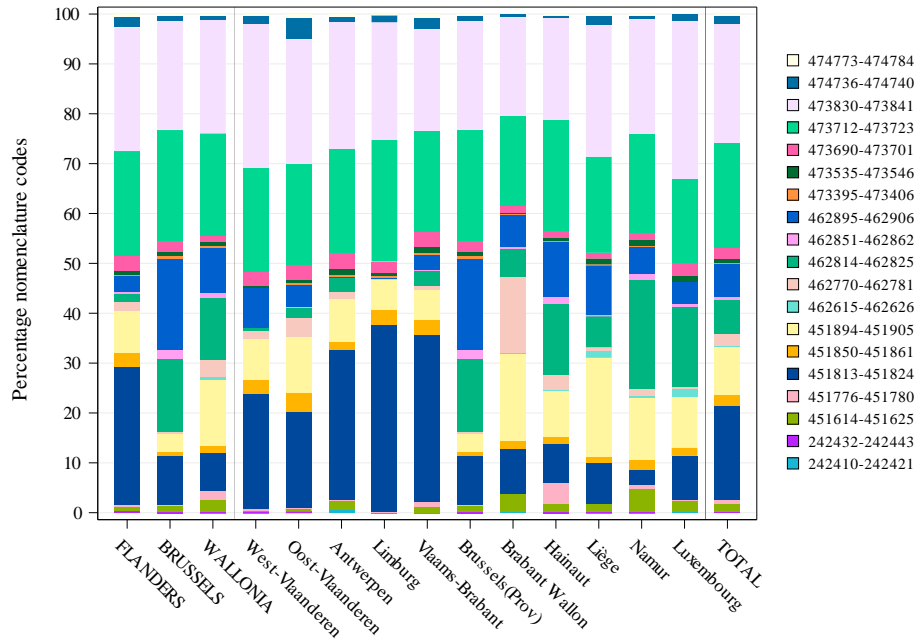
Identification of alternatives by code grouping :

Nomenclature Code		Group	
Outpatient	Inpatient	Codegroup in Group 1	Codegroup in Group 2
242410	242421	1_Exploration	NA
242432	242443	1_Exploration	NA
451614	451625	1_Exploration	NA
451776	451780	1_Exploration	NA
451850	451861	1_Exploration	NA
462615	462626	1_Exploration	NA
462770	462781	1_Exploration	NA
462851	462862	1_Exploration	NA
473395	473406	1_Exploration	NA
473535	473546	1_Exploration	NA
474736	474740	1_Exploration	NA
474773	474784	1_Exploration	NA
451813	451824	2_Non-Surgical	NA
451894	451905	2_Non-Surgical	NA
462814	462825	2_Non-Surgical	NA
462895	462906	2_Non-Surgical	NA
473690	473701	2_Non-Surgical	NA
473712	473723	2_Non-Surgical	NA
473830	473841	2_Non-Surgical	NA

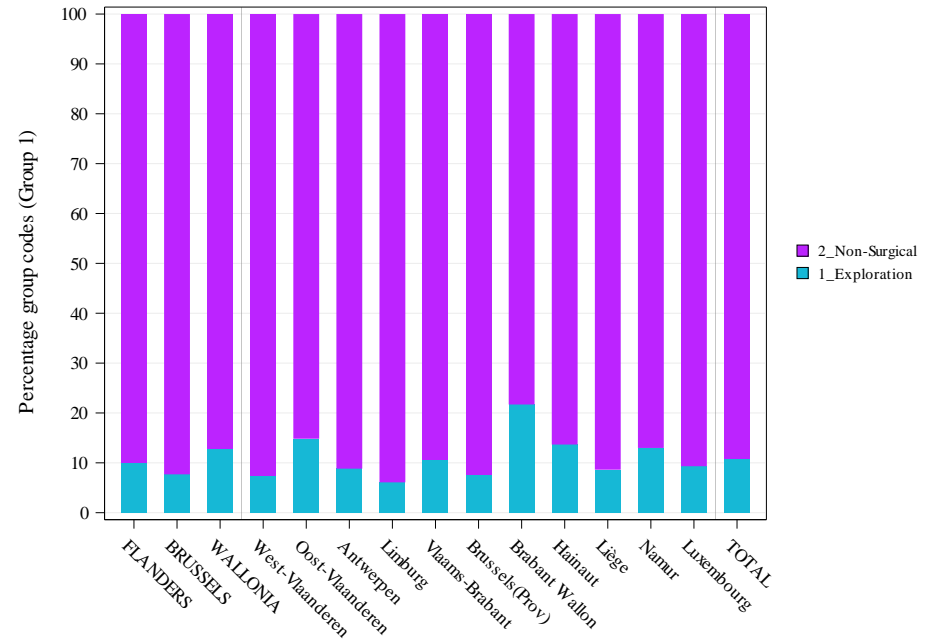


Depending on the nature of the practice and the analytical tools available, it may be possible to identify and define alternatives for carrying out this practice. In this case, the nomenclature codes defined for the analysis of the practice are grouped according to one logic (Group 1) or two (Groups 1 and 2) following the cases. These groupings make it possible to analyse whether or not the choices of these alternatives are homogeneous across the territory.

In addition, the analysis also covers the nomenclature codes in order to observe whether there are variations in the coding of the practice or in the choice of codes provided. See page 4 for details about the NIHDI nomenclature codes selected for analysis.



Distribution of choice of practice alternatives, by codes



Distribution of choice of practice alternatives, based on group 1

Significance of the variations observed in the choice of alternatives:

Significance	By region	By province
Based on codes	***	***
Based on group 1	***	***
Based on group 2	-	-

The **asterisks** represent the level of statistical significance of the observed data with the following values: * Value threshold of $p \leq 0,05$ / ** Value threshold of $p \leq 0,01$ / *** Value threshold of $p \leq 0,001$. The mention NS indicates that the variations are not significant.