

Medical practice variations

Radiotherapy (Adjusted)

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 **2021**



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

Appropriate care unit

Pascal Meeus, Virginie Dalcq, Delphine Beauport, Katrien Declercq, Lucien Hoekx, Kathleen Sierens, Benjamin Swine

Contact: appropriatecare@riziv-inami.fgov.be

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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 2016-2018¹. 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 Radiotherapy (Adjusted), 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:

Output	Input	Rate	Expend	Label	Creation	Deletion	Group N	Value
446135	446124	yes	yes	Honoraires forfaitaires pour une série d'irradiations externes simples de 1 à 10 fractions chez un patient qui répond aux critères ou pathologie repris en catégorie 1	01-06-2001		N45	K500
446135	446146	yes	yes	Honoraires forfaitaires pour une série d'irradiations externes simples de 11 à 35 fractions chez un patient qui répond aux critères ou pathologie repris en catégorie 2	01-06-2001		N45	K1200
446150	446151	yes	yes	Honoraires forfaitaires pour une série d'irradiations externes complexes chez un patient qui répond aux critères ou pathologie repris en catégorie 3	01-06-2001		N45	K3600
446272	446283	yes	yes	Honoraires forfaitaires pour une série d'irradiations externes complexes chez un patient qui répond aux critères ou pathologie repris en catégorie 4	01-06-2001		N45	K2000
446294	446295	yes	yes	Honoraires forfaitaires pour une série d'irradiations externes exclusives par électrons chez un patient qui répond aux critères ou pathologie repris en catégorie 9	01-06-2001		N45	K300
446216	446220	yes	yes	Honoraires forfaitaires pour curiethérapie exclusive chez un patient qui répond aux critères ou pathologie repris en catégorie 7	01-06-2001		N45	K500
446231	446242	yes	yes	Honoraires forfaitaires pour curiethérapie exclusive chez un patient qui répond aux critères ou pathologie repris en catégorie 9	01-06-2001		N45	K300
446253	446264	yes	yes	Honoraires forfaitaires pour curiethérapie exclusive chez un patient qui répond aux critères ou pathologie repris en catégorie 8	01-06-2001		N45	K840
446275	446286	yes	yes	Honoraires forfaitaires pour curiethérapie exclusive chez un patient qui répond aux critères ou pathologie repris en catégorie 10 (prévention de rechutes)	01-06-2001	31-07-2017	N45	-
446290	446301	yes	yes	Honoraires forfaitaires pour curiethérapie combinée à une série d'irradiations externes chez un patient qui répond aux critères ou pathologie repris en catégorie 5	01-06-2001		N45	K800
446312	446323	yes	yes	Honoraires forfaitaires pour curiethérapie combinée à une série d'irradiations externes chez un patient qui répond aux critères ou pathologie repris en catégorie 6	01-06-2001		N45	K500
446334	446345	yes	yes	Honoraires forfaitaires pour un traitement conventionnel (désintégration de 200 à 300 KV, thérapie de contact de 50 KV) de 1 à 15 fractions chez un patient qui répond aux critères ou pathologie repris en catégorie 11	01-06-2001		N45	K300
446356	446360	no	no	Honoraires forfaitaires pour les préparations avec simulation d'un traitement par irradiation externe ou de curiethérapie, par série d'irradiation pour un patient de catégorie 1, 2, 3, 4, 4bis, 5, 6, 7 ou 8, la première simulation, excepté pour les patients de catégorie 8 avec un traitement pour cancer de la prostate par implantation permanente de grains d'iodo radioactifs	01-06-2001		N45	K221
446371	446382	no	yes	Honoraires forfaitaires pour les préparations avec simulation d'un traitement par irradiation externe ou de curiethérapie, par série d'irradiation pour un patient de catégorie 2, 3, 4, 4bis, 5, 6 ou 8, deuxième simulation	01-06-2001		N45	K71
446393	446404	no	yes	Honoraires forfaitaires pour le calcul de la distribution de la dose individuelle d'un traitement par irradiation externe ou de curiethérapie chez des patients de catégorie 1, 2, 3, 4, 4bis, 5, 6, 7 ou 8, premier planning	01-06-2001		N45	K250
446415	446426	no	yes	Honoraires forfaitaires pour le calcul de la distribution de la dose individuelle d'un traitement par irradiation externe ou de curiethérapie chez des patients de catégorie 2, 3, 4, 4bis, 5, 6 ou 8, deuxième planning	01-06-2001		N45	K125
446430	446441	no	yes	Honoraires supplémentaires lors de la prestation 446393 - 446404 (premier planning) pour le calcul de la distribution tridimensionnelle de la dose individuelle pour irradiation externe chez des patients de catégorie 3, 4, 4bis	01-06-2001		N45	K125
446452	446463	no	yes	Honoraires supplémentaires lors de la prestation 446393 - 446404 (premier planning) pour le calcul de la dose individuelle avec utilisation d'un programme de modulation d'intensité pour irradiation avec un collimateur multi-lames chez des patients de catégorie 3, 4, 4bis	01-06-2001		N45	K100
446474	446485	no	yes	Honoraires pour gammagraphie chez un patient de catégorie 1, 2, 3 ou 4 traité par irradiation externe, maximum 4 par série d'irradiation	01-06-2001		N45	K25
446496	446500	no	yes	Honoraires pour imagerie portale en ligne chez un patient de catégorie 1, 2, 3, 4, 4bis traité par irradiation externe, maximum 4 par série d'irradiation	01-06-2001		N45	K25
446511	446522	no	yes	Honoraires pour desimétrie in vivo chez des patients de catégorie 1, 2, 3, 4, 4bis traité par irradiation externe, maximum 4 par série d'irradiation	01-06-2001		N45	K25
446533	446544	no	yes	Honoraires supplémentaires pour irradiation avec un collimateur multi-lames chez des patients de catégorie 3, 4, 4bis, par série d'irradiation	01-06-2001		N45	K150
446555	446566	no	yes	Honoraires supplémentaires pour curiethérapie avec utilisation d'un système de chargement distant avec capteur automatique de sources chez des patients de catégorie 5, 6, 7 ou 8 par série d'irradiation	01-06-2001		N45	K100
446570	446581	no	yes	Masses ou systèmes de fraction individuelle lors d'irradiation externe chez des patients de catégorie 1 pour localisations tête et cou et chez des patients de catégorie 2, 3, 4, 4bis, par série d'irradiation	01-06-2001		N45	K125
446592	446603	no	yes	Blocs individualisés pour traitement par irradiation externe et/ou par curiethérapie des patients de catégorie 1, 2, 3, 4, 5, 6, 7 ou 8, par série d'irradiation	01-06-2001		N45	K75
446614	446625	no	yes	CT en localisation effectuée lors de la prestation 446393-446404 (2e simulation) et/ou de la prestation 446371-446382 (2e simulation)	01-08-2017		N45	K79
446636	446640	yes	yes	Honoraires forfaitaires pour une série d'irradiations stéréotactiques chez un patient qui répond aux critères repris dans la catégorie 4bis, tumeurs primaires, à l'exception de tumeurs cérébrales	01-01-2020		N45	K2000
446651	446662	yes	yes	Honoraires forfaitaires pour une série d'irradiations stéréotactiques chez un patient qui répond aux critères repris dans la catégorie 4bis, oligométastases, à l'exception de métastases cérébrales	01-01-2020		N45	K2000
446673	446684	yes	yes	Honoraires forfaitaires pour une série d'irradiations stéréotactiques chez un patient qui répond aux critères repris dans la catégorie 4bis, tumeurs cérébrales malignes et métastases cérébrales	01-01-2020		N45	K2000
446695	446706	yes	yes	Honoraires forfaitaires pour une série d'irradiations stéréotactiques chez un patient qui répond aux critères repris dans la catégorie 4bis, tumeurs cérébrales non malignes et métastases artério-veineuses (MNV)	01-01-2020		N45	K2000
446710	446721	yes	yes	Irradiation du sein via hypofractionnement (5 fractions) avec modulation d'intensité (IMRT) dans le cadre du COVID19	14-03-2020		N45	K2000

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
444356	444360	01-06-2001	Honoraires forfaitaires pour les préparations avec simulation d'un traitement par irradiation externe ou de curiethérapie, par série d'irradiation pour un patient de catégorie 1, 2, 3, 4, 5, 6, 7 ou 8, la première simulation
444356	444360	01-02-2012	Honoraires forfaitaires pour les préparations avec simulation d'un traitement par irradiation externe ou de curiethérapie, par série d'irradiation pour un patient de catégorie 1, 2, 3, 4, 5, 6, 7 ou 8, la première simulation, excepté pour les patients de catégorie 8 avec un traitement pour cancer de la prostate par implantation permanente de grains d'iode radioactifs
444356	444360	01-01-2020	Honoraires forfaitaires pour les préparations avec simulation d'un traitement par irradiation externe ou de curiethérapie, par série d'irradiation pour un patient de catégorie 1, 2, 3, 4, 4bis, 5, 6, 7 ou 8, la première simulation, excepté pour les patients de catégorie 8 avec un traitement pour cancer de la prostate par implantation permanente de grains d'iode radioactifs
444371	444382	01-06-2001	Honoraires forfaitaires pour les préparations avec simulation d'un traitement par irradiation externe ou de curiethérapie, par série d'irradiation pour un patient de catégorie 2, 3, 4, 5, 6 ou 8, deuxième simulation
444371	444382	01-01-2020	Honoraires forfaitaires pour les préparations avec simulation d'un traitement par irradiation externe ou de curiethérapie, par série d'irradiation pour un patient de catégorie 2, 3, 4, 4bis, 5, 6 ou 8, deuxième simulation
444393	444404	01-06-2001	Honoraires forfaitaires pour le calcul de la distribution de la dose individuelle d'un traitement par irradiation externe ou de curiethérapie chez des patients de catégorie 1, 2, 3, 4, 5, 6, 7 ou 8, premier planning
444393	444404	01-01-2020	Honoraires forfaitaires pour le calcul de la distribution de la dose individuelle d'un traitement par irradiation externe ou de curiethérapie chez des patients de catégorie 1, 2, 3, 4, 4bis, 5, 6, 7 ou 8, premier planning
444415	444426	01-06-2001	Honoraires forfaitaires pour le calcul de la distribution de la dose individuelle d'un traitement par irradiation externe ou de curiethérapie chez des patients de catégorie 2, 3, 4, 5, 6 ou 8, deuxième planning
444415	444426	01-01-2020	Honoraires forfaitaires pour le calcul de la distribution de la dose individuelle d'un traitement par irradiation externe ou de curiethérapie chez des patients de catégorie 2, 3, 4, 4bis, 5, 6 ou 8, deuxième planning
444430	444441	28-07-2003	Honoraires supplémentaires lors de la prestation 444393 - 444404 (premier planning) pour le calcul de la distribution tridimensionnelle de la dose individuelle pour irradiation externe chez des patients de catégorie 3 ou 4
444430	444441	01-01-2020	Honoraires supplémentaires lors de la prestation 444393 - 444404 (premier planning) pour le calcul de la distribution tridimensionnelle de la dose individuelle pour irradiation externe chez des patients de catégorie 3, 4, 4bis
444452	444463	28-07-2003	Honoraires supplémentaires lors de la prestation 444393 - 444404 (premier planning) pour le calcul de la dose individuelle avec utilisation d'un programme de modulation d'intensité pour irradiation avec un collimateur multi-lames chez des patients de catégorie 3 ou 4
444452	444463	01-01-2020	Honoraires supplémentaires lors de la prestation 444393 - 444404 (premier planning) pour le calcul de la dose individuelle avec utilisation d'un programme de modulation d'intensité pour irradiation avec un collimateur multi-lames chez des patients de catégorie 3, 4, 4bis
444496	444500	28-07-2003	Honoraires pour imagerie portale en ligne chez un patient de catégorie 1, 2, 3 ou 4 traité par irradiation externe, maximum 4 par série d'irradiation
444496	444500	01-01-2020	Honoraires pour imagerie portale en ligne chez un patient de catégorie 1, 2, 3, 4, 4bis traité par irradiation externe, maximum 4 par série d'irradiation
444511	444522	28-07-2003	Honoraires pour dosimétrie in vivo chez des patients de catégorie 1, 2, 3 ou 4 traités par irradiation externe, maximum 4 par série d'irradiation
444511	444522	01-01-2020	Honoraires pour dosimétrie in vivo chez des patients de catégorie 1, 2, 3, 4, 4bis traités par irradiation externe, maximum 4 par série d'irradiation
444533	444544	28-07-2003	Honoraires supplémentaires pour irradiation avec un collimateur multi-lames chez des patients de catégorie 3 ou 4, par série d'irradiation
444533	444544	01-01-2020	Honoraires supplémentaires pour irradiation avec un collimateur multi-lames chez des patients de catégorie 3, 4, 4bis, par série d'irradiation
444570	444581	28-07-2003	Masques ou systèmes de fixation individuelle lors d'irradiation externe chez des patients de catégorie 1 pour localisations tête et cou et chez des patients de catégorie 2, 3 ou 4, par série d'irradiation
444570	444581	01-01-2020	Masques ou systèmes de fixation individuelle lors d'irradiation externe chez des patients de catégorie 1 pour localisations tête et cou et chez des patients de catégorie 2, 3, 4, 4bis, par série d'irradiation



This table displays the historic evolution of the definitions of the NIHDI-nomenclature codes taken into account for this analysis, if modifications were implemented during the period 2011-2021.

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 2011-2021
Document P	for the utilisation rate and amount of expenses of insured persons (who meet the selection criteria) by type of medical specialities in 2021
Document P, SHA, ADH	for the practice occurrences and analysis of patient care settings in 2019
-	-

Analysis period	2011-2021
------------------------	-----------



'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.

'Documents SHA, ADH' are sent annually and within six months by the insurer-organisations to the NIHDI. They include all the services provided respectively in day admission and standard hospitalisation, in general hospitals per hospital stay.

D. Specific selection criteria

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

FILTERS APPLIED TO DATA	
Sex	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 (standardization based on population in 2021).



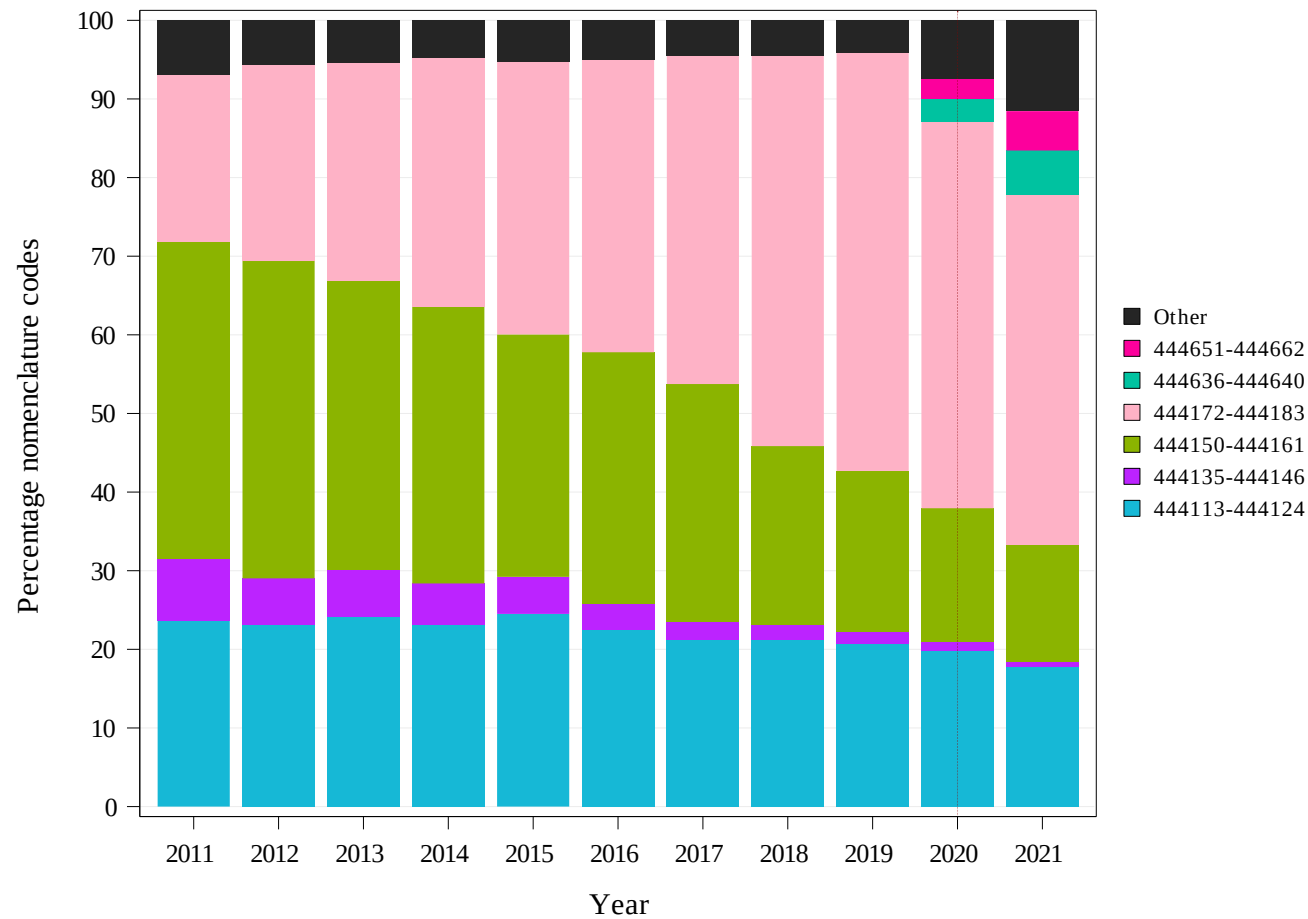
Standardisation renders populations comparable in relation to one or several criteria. If a difference is observed between these populations, we can therefore assume that it is not due to the criteria covered by the standardisation process.

3. RESULTS

A. National standardised rate of use

	TOTAL
Average number of interventions per year	33.867
Standardised rate of use per 100 000 insured persons	295

B. Breakdown of nomenclature codes provided, by volume



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

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.

C. Specialisation of healthcare providers

Specialisation of the provider	Total providers	Concerned providers	% Providers	Median of H.C. services	Q3 of H.C. services	% Total H.C. services
Radiotherapy	204	178	87%	178	236	99,80%
Other specialities	253	3	1%	33	33	0,20%
Total	457	181	40%	176	236	100,00%



This table shows the following non-standardised data, by medical specialities (figures for the year 2021):

- The number of service-providers per specialisation who have recorded at least one service (the figures are exceptionally extrapolated from a single semester if an * is indicated in the header, otherwise the full year is taken into account);
- 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);
- The service percentage, i.e. the number of services recorded for this specialisation as a percentage of total services provided.

D. Specialisation of prescribers

Specialisation of the prescriber	Total prescribers	Concerned prescribers	% Prescribers	Median of prescriptions	Q3 of prescriptions	% Prescriptions
Not applicable	0	0	0%	0	0	100,00%



This table shows, in order, the following non-standardised data per specialities (figures for the year 2021):

- The number of prescribers who have prescribed at least one service (the figures are exceptionally extrapolated from a single semester if an * is indicated in the header, otherwise the full year is taken into account);
- 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);
- The percentage of services prescribed, i.e. the number of prescriptions issued for this specialisation as a percentage of total services prescribed.

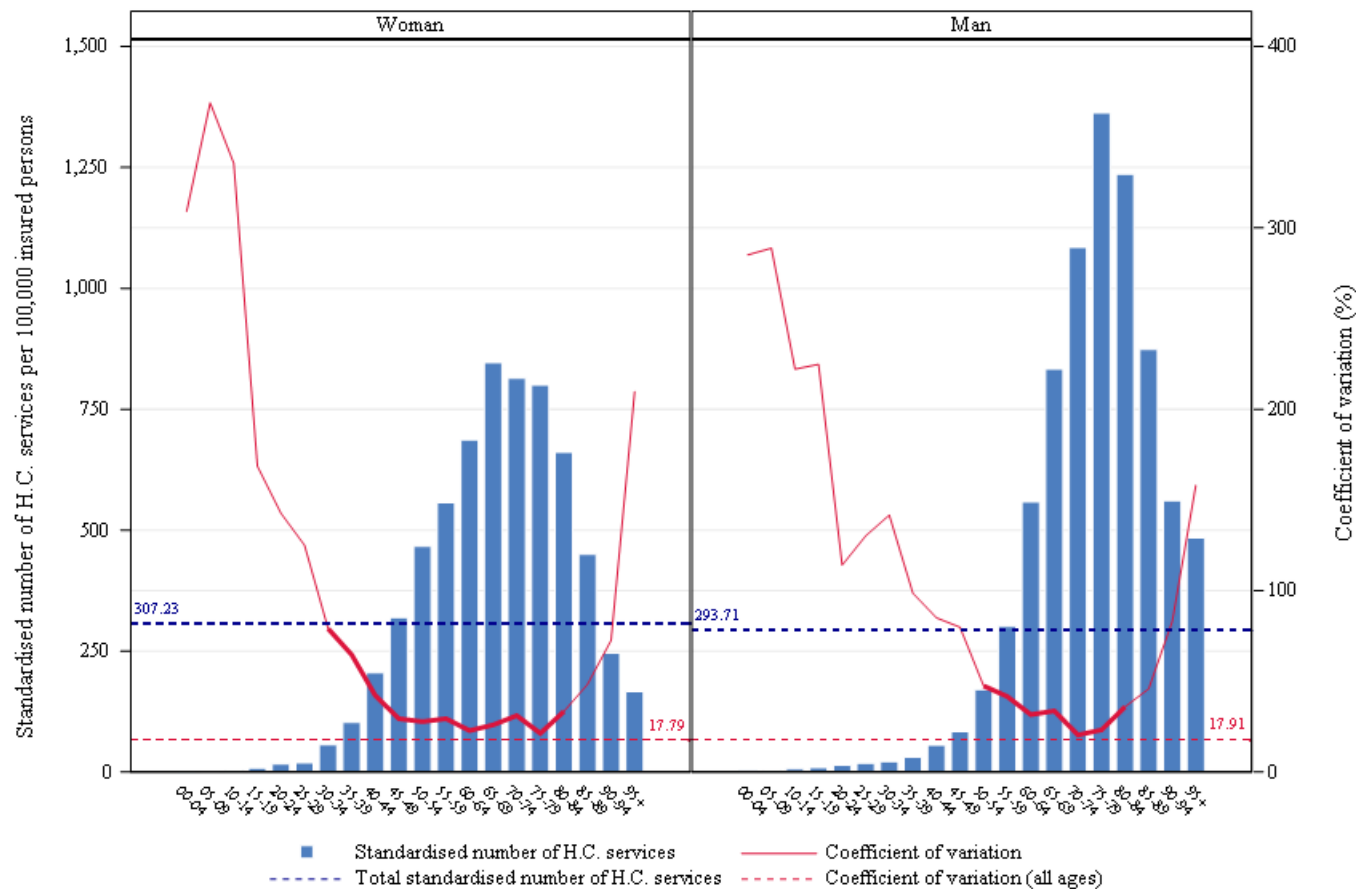
E. Standardised rate of use by sex and age group

	TOTAL
<i>Average number of interventions per year</i>	33.867
Median age (years)	68
Mean age (years)	66,18
Max/Min Ratio of the median age (by district)	1,08
Percentage of women	54,37%

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 is reported as 'NA' ('not applicable').

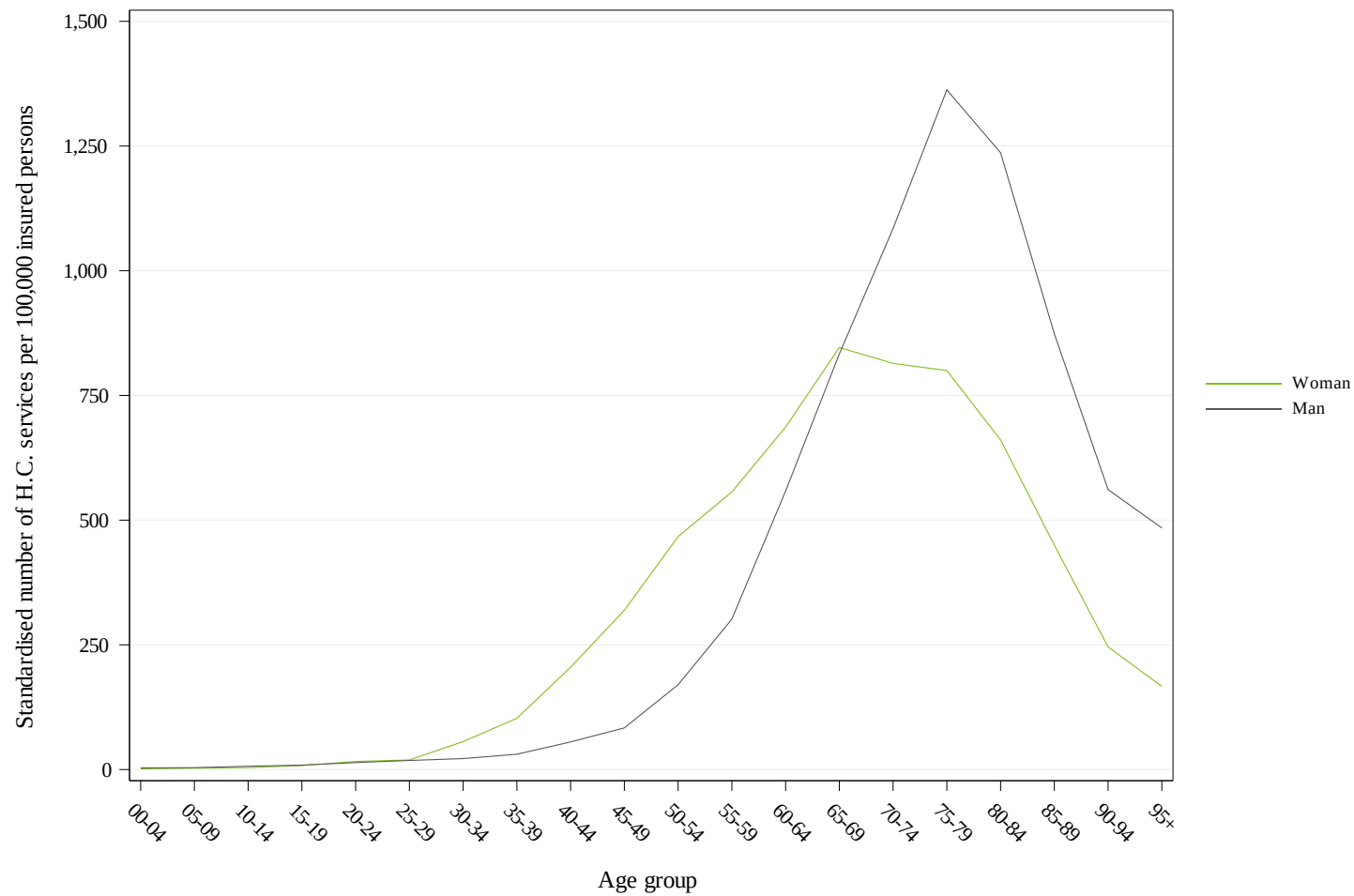
Radiotherapy - Radiotherapy (Adjusted)



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 rates of use 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).

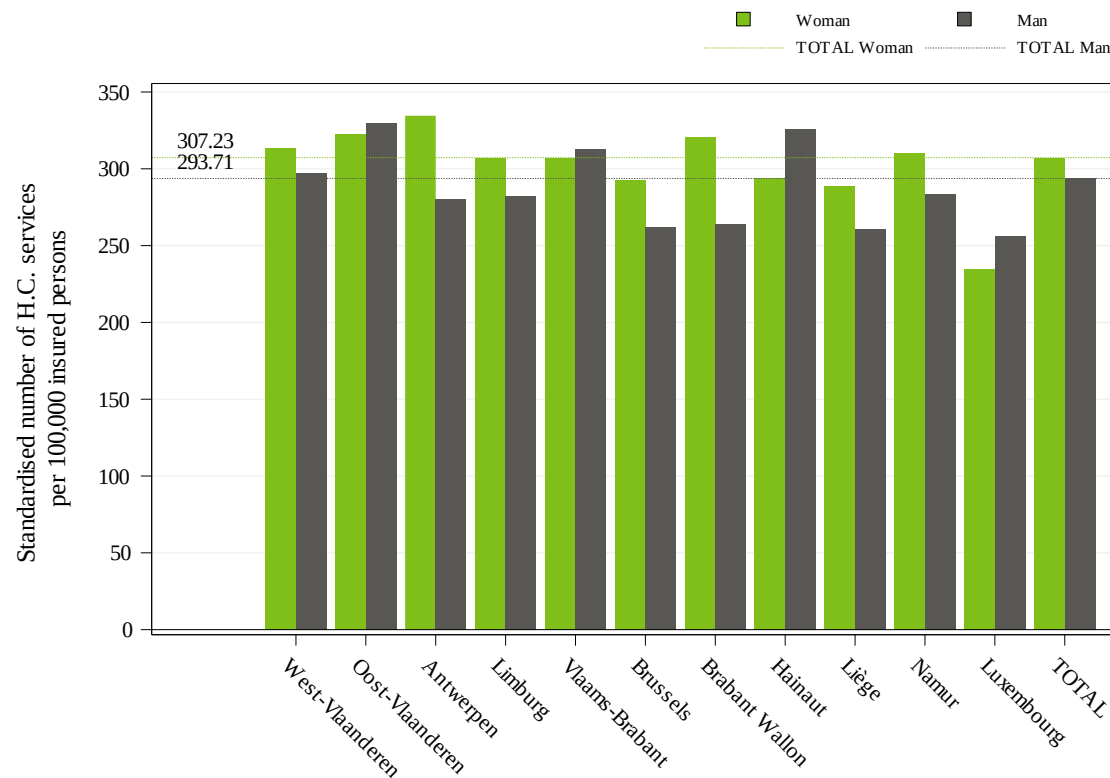
The left-hand vertical axis of the graph represents the standardised rate of use, and the right-hand axis the coefficient of variation. The horizontal axis shows the age groups. The horizontal dotted lines show the total values of the standardised rates of use (in blue) and of the coefficient of variation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

Standardised rate of use per 100 000 insured persons, and coefficient of variation for the districts, by age group and sex, for the year 2021



Comparison of the standardised rates of use by sex (per 100 000) in 2021

Radiotherapy - Radiotherapy (Adjusted)

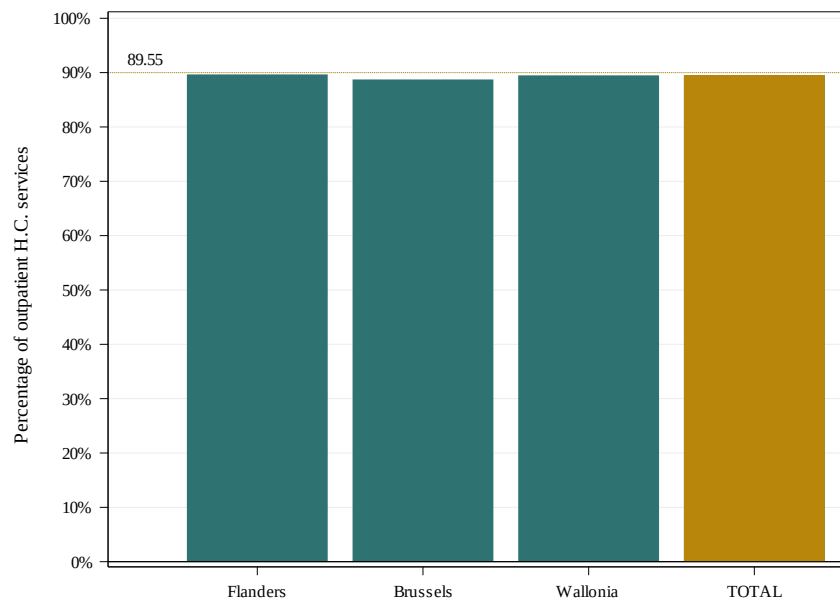


This histogram shows standardised rates of use by province and by sex. The grey bars show the rates for men, while the green bars show the rates for women, for each province. The grey and green broken lines show the total standardised rates of use, again grey for men, green for women.

Standardised rate of use per 100 000 insured persons, by sex and by province for the year 2021

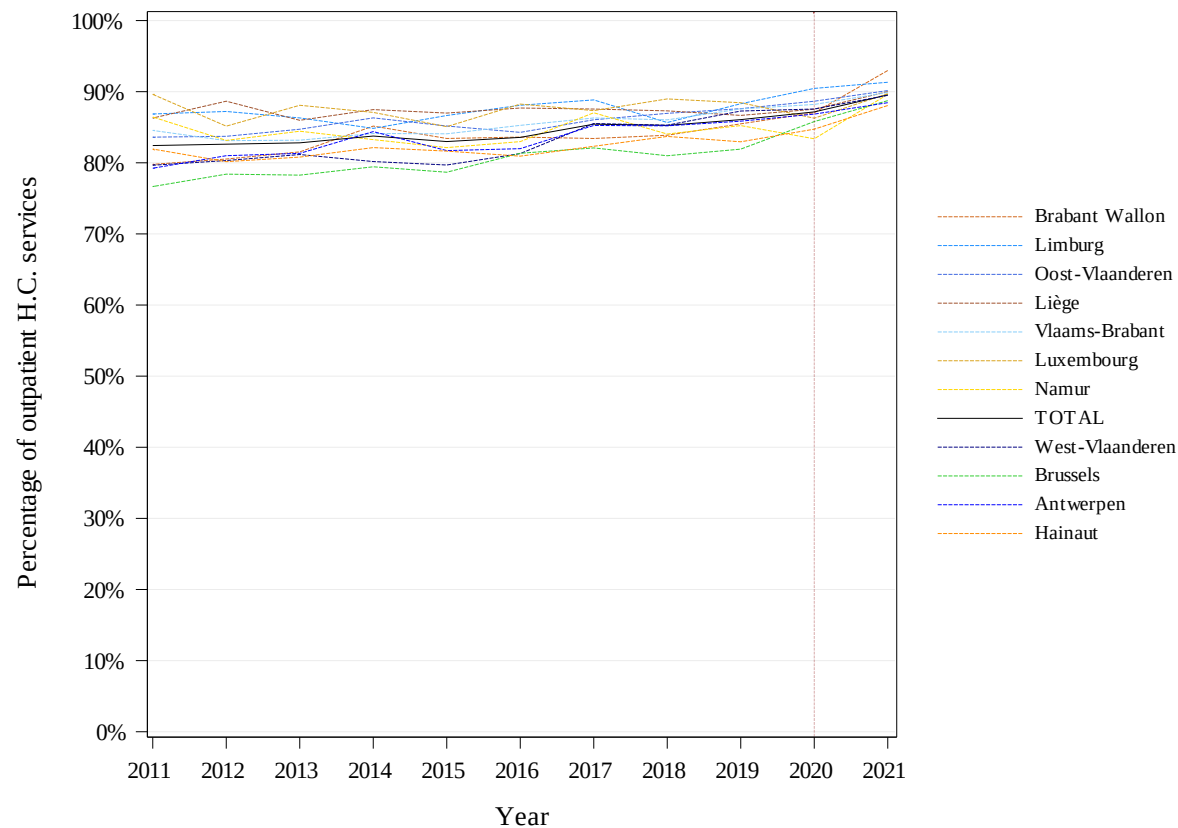
F. Standardised rate of use: hospital and outpatient care

	TOTAL
<i>Average number of interventions per year</i>	33.867
Percentage of out-patient care	89,55%
Max/min ratio of out-patient care percentage (by district)	1,11



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.



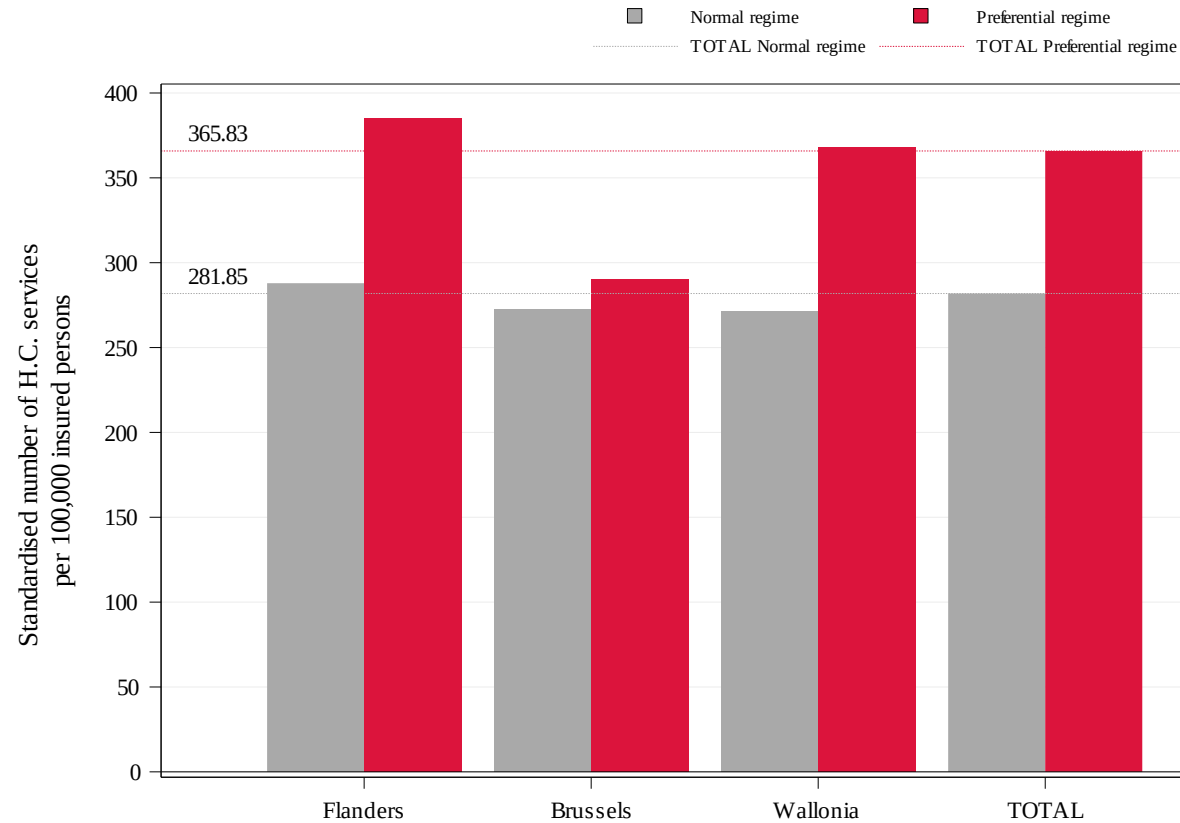
Change over time in the percentage of outpatient care, by province

N.B.:

- 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 complementary document to this chapter, about the handling of patients per health care sector, is [enclosed in this report](#) (cf. p.36)

G. Standardised rate of use by reimbursement scheme

	TOTAL
<i>Average number of interventions per year</i>	33.867
Percentage provided under the preferential reimbursement scheme	24,61%
Standardised rate of use with preferential reimbursement scheme (per 100 000)	366
Standardised rate of use without preferential reimbursement scheme (per 100 000)	282
Ratio Preferential scheme /General scheme	1,3



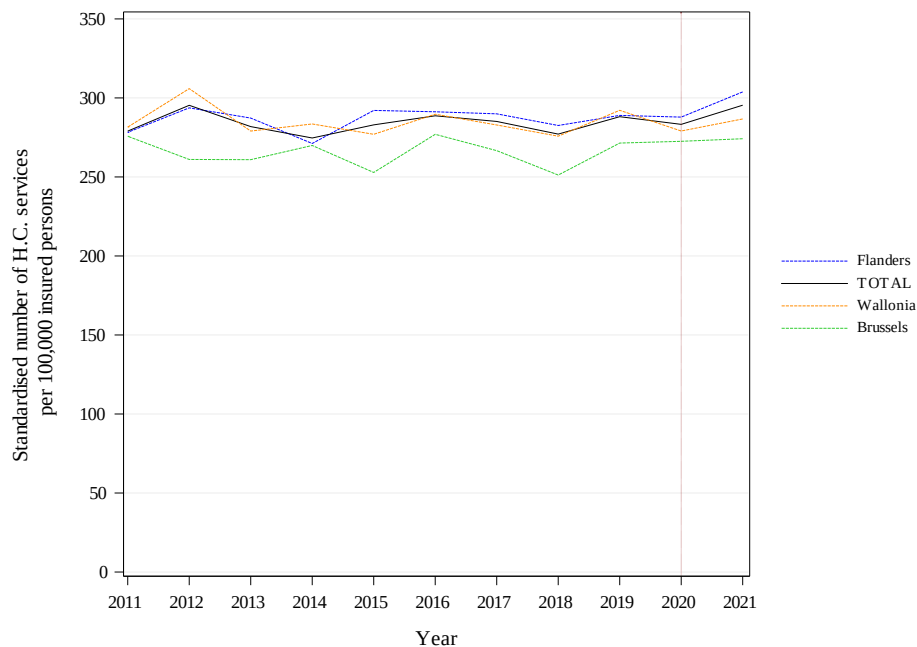
Standardised rate of use by reimbursement scheme and by region

This graph shows the standardised rates of use 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, with and without the preferential reimbursement scheme, respectively.

H. Trends in standardised rates of use

	TOTAL
<i>Average number of interventions per year</i>	33.867
Trend (2011-2021)	0,57%
Trend (2011-2019)	0,40%
Trend (2019-2021)	1,25%

These trends correspond to the average annual growth rate.

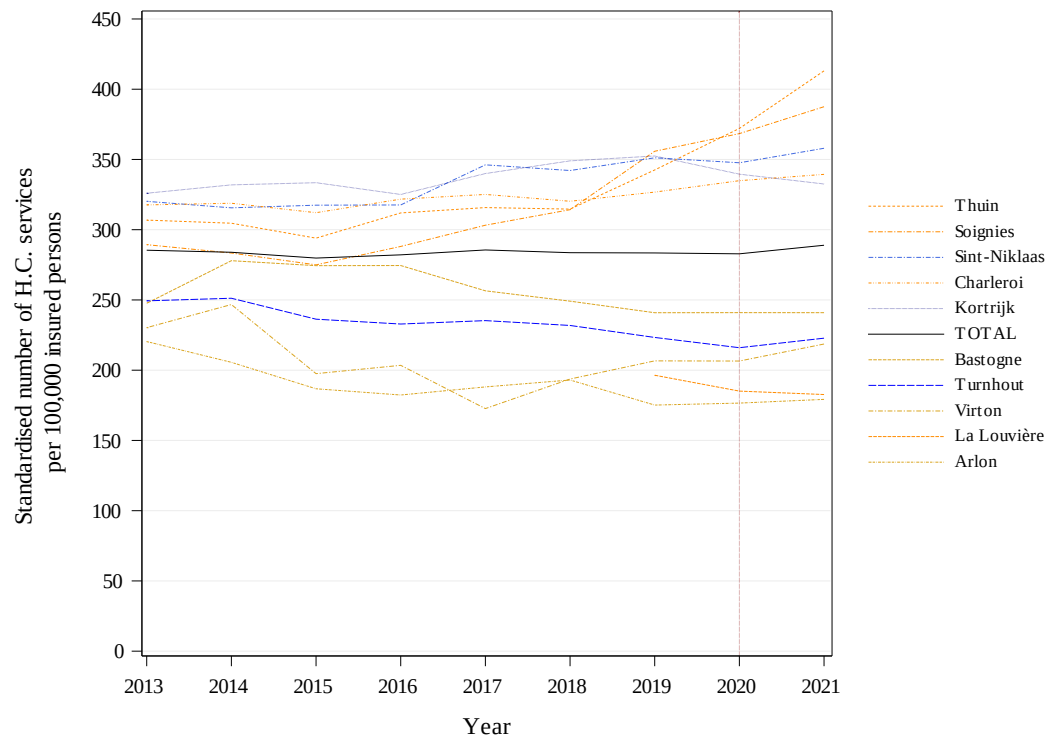


This graph shows a coloured curve for each region and a black curve for the entire Belgian population. The x-axis shows the years, and the y-axis shows the standardised rate of use per 100 000 insured persons.

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 rate of use per 100 000 insured persons, by region

Radiotherapy - Radiotherapy (Adjusted)



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

This graph shows a colored line for each district and a black line for the entire 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.

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.

		Rate of use	Annual increase			Structural break
		2021 (per 10 ⁵ insured)	2011- 2021	2011- 2019	2019- 2021	
Provinces	West Flanders	300,33	0,49%	1,34%	-2,85%	NA
	East Flanders	320,50	1,69%	1,32%	3,14%	NA
	Antwerp	302,26	1,43%	0,60%	4,83%	NA
	Limburg	290,10	-0,01%	-0,39%	1,56%	NA
	Flemish Brabant	303,85	0,24%	-1,31%	6,70%	NA
	Brussels	274,18	-0,06%	-0,20%	0,51%	NA
	Walloon Brabant	288,73	0,34%	-1,03%	6,03%	NA
	Hainaut	304,17	0,46%	1,21%	-2,50%	NA
	Liège	270,97	-0,34%	0,48%	-3,56%	NA
	Namur	294,61	0,34%	-0,35%	3,15%	NA
	Luxembourg	240,69	0,17%	0,33%	-0,46%	NA
Regions	Flanders	303,80	0,88%	0,47%	2,54%	NA
	Brussels	274,18	-0,06%	-0,20%	0,51%	NA
	Wallonia	286,69	0,18%	0,46%	-0,94%	NA
TOTAL		295,39	0,57%	0,40%	1,25%	*

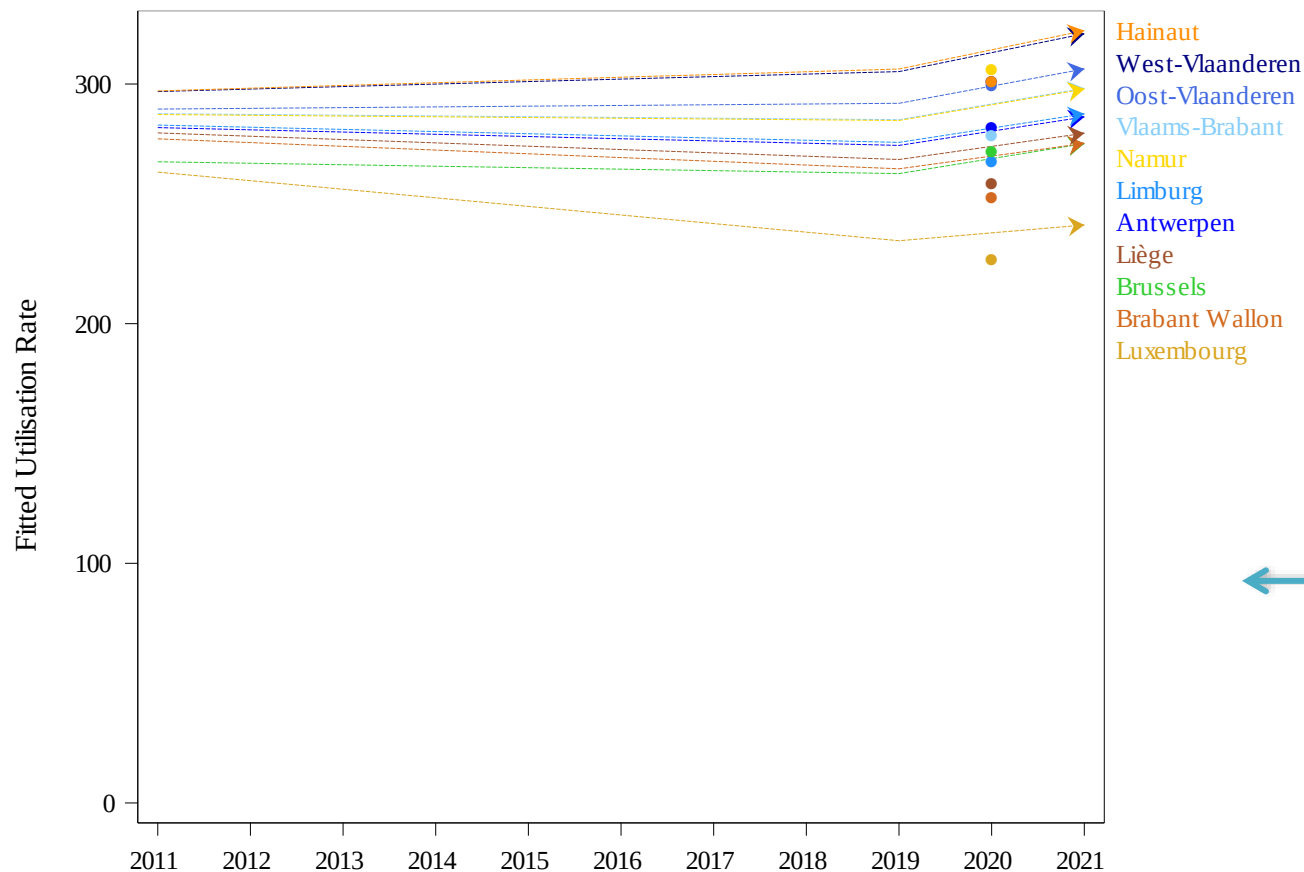
Trends in the rates of use, by province and region

This table reports the standardised **rates of use** for the last year analysed (2021), as well as the average **rates of increase**, by province, by region and in total, for the entire period (2011-2021), for the last three years (2019-2021) and for the period preceding the last three years (2011-2019)

In order to find out whether the trend in the last three 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 three-year period or when the statistical tests cannot be evaluated.



Regression lines per province showing a possibly different slope for the last three years (2019-2021) compared to the years before (2011-2019).

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

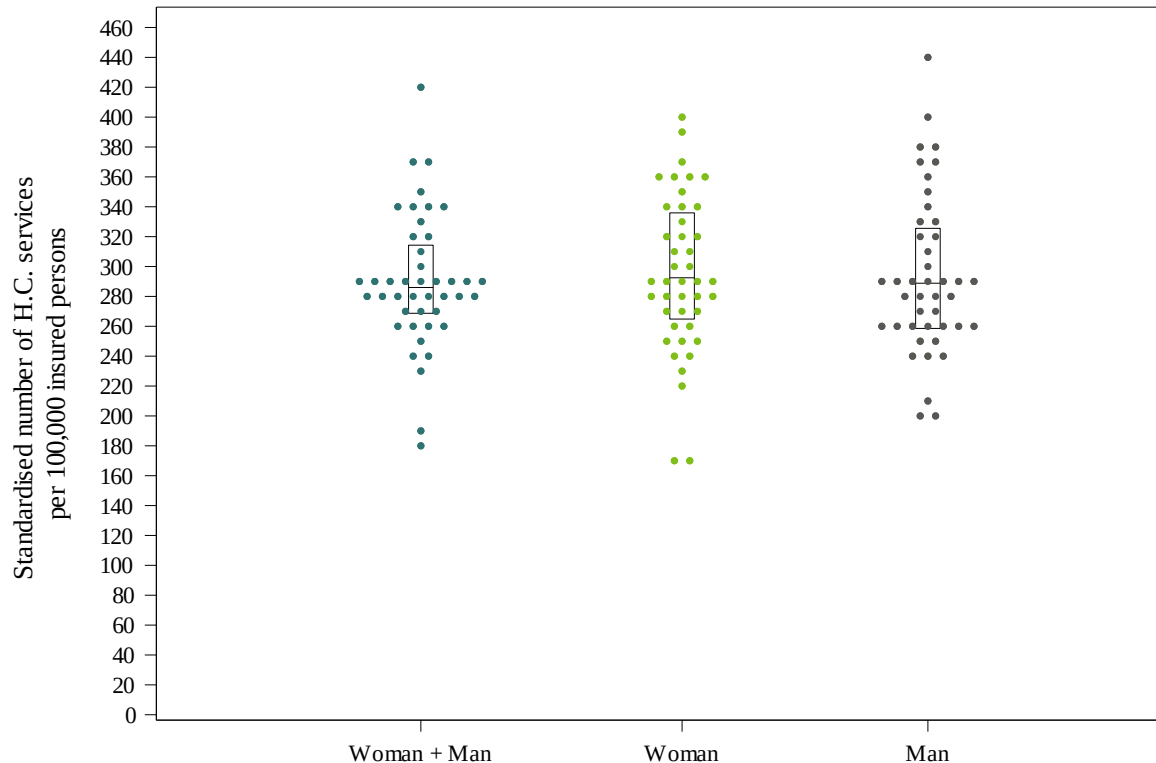
Trend break assessment model by province – Regression lines

I. Geographical variations in standardised rates of use

	TOTAL
<i>Average number of interventions per year</i>	33.867
Coefficient of Variation (2021)	15,47
Max/Min Ratio* of the standardised rates of use (by region)	1,11
Max/Min Ratio* of the standardised rates of use (by district)	2,34

Coefficient of Variation (2019-2021)	15,57
Coefficient of Variation (2011-2013)	10,61
<i>Statistically significant difference? ($p \leq 0.05$)</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 sex and age group)

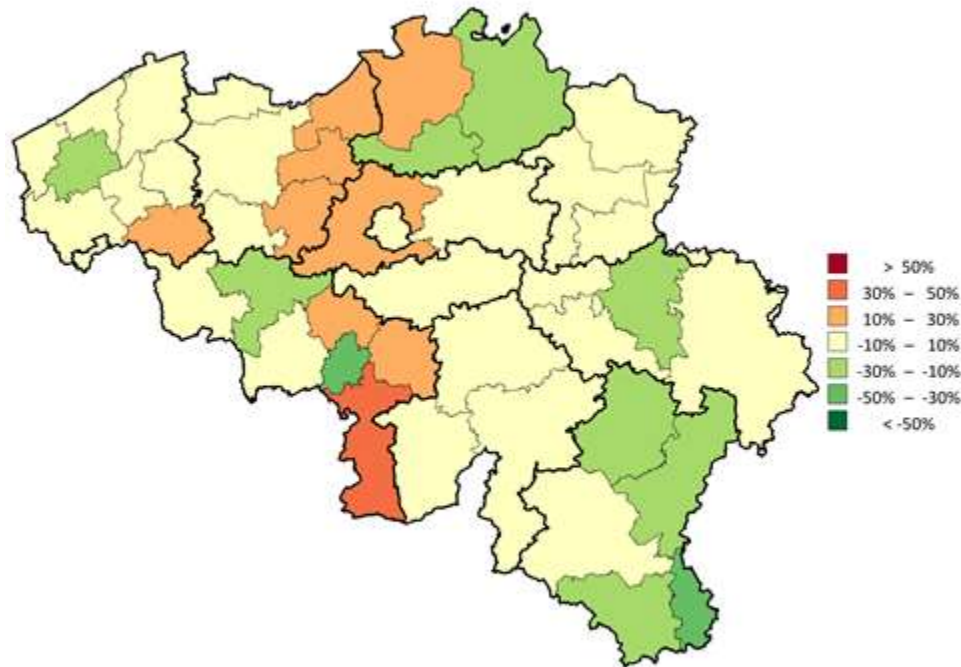


'Dot plot' showing standardised rates of use by district, by sex

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 rate of use 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 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.

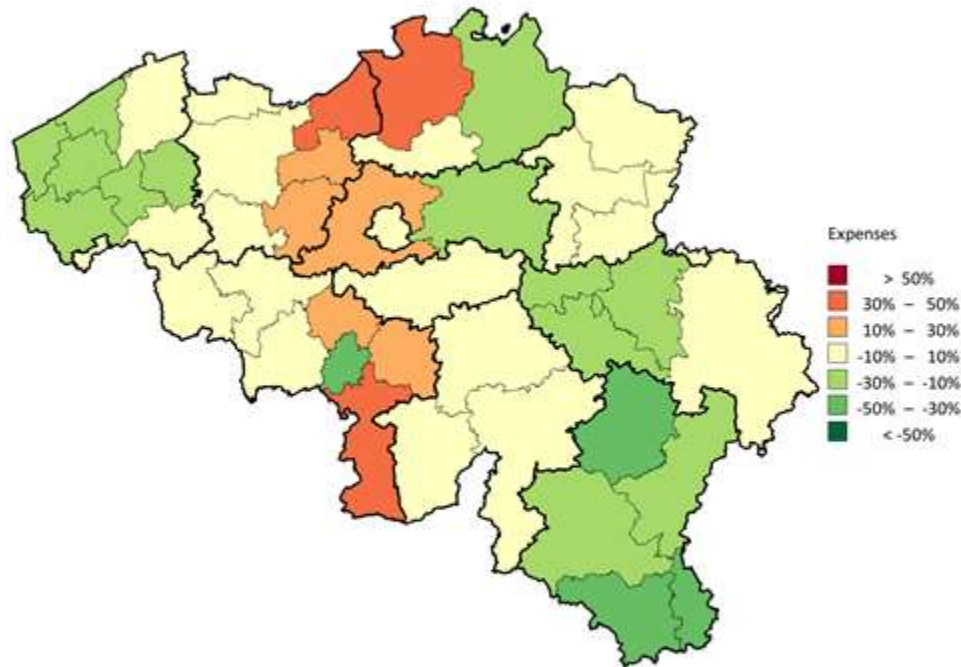


Map showing distribution of standardised rates of use, by district

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 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
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	Not used

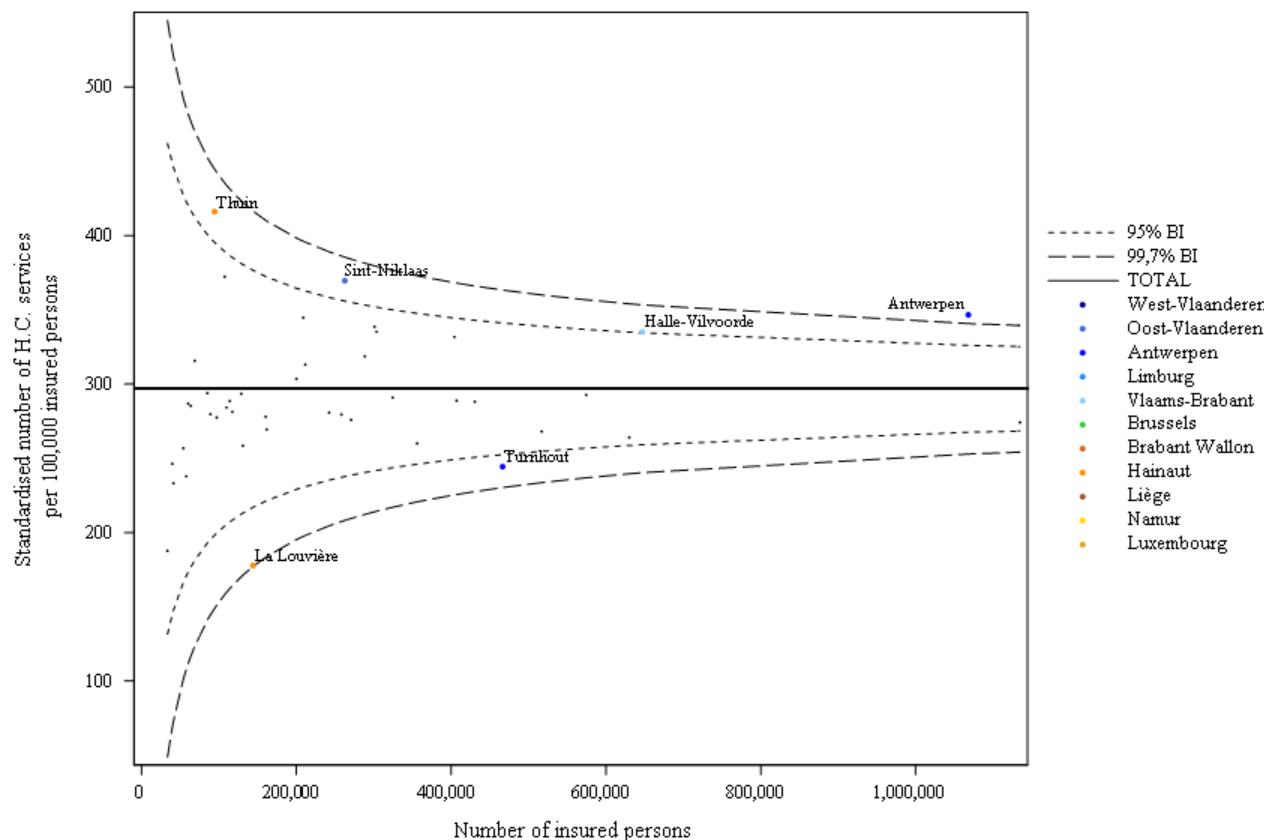
N.B.: The interpretation of this map is to be done in parallel with [the graph in funnel plot](#) (p.28)



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 national (overall) expenditure. 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
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%
Medium Green	Between -50% and - 30%
Dark Green	Less than -50%
White	No expenditure



In this graph, the standardised rate of use 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 rate of use. 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 rates of use](#) (p.26)

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

J. Standardised healthcare expenditure borne by the insurance

	TOTAL
<i>Average number of interventions per year</i>	33.867
Average annual expenditure (€)	146.586.881
Average cost per intervention (€)	4328,28
Average annual expenditure per insured (€)	12,79
Max/Min Ratio* of expenditure per insured (by region)	1,12
Max/Min Ratio* of expenditure per insured (by district)	2,72

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

		Standardised expenditure (per insured)
Provinces	West Flanders	11,37 €
	East Flanders	14,32 €
	Antwerp	14,93 €
	Limburg	12,12 €
	Flemish Brabant	12,58 €
	Brussels	11,90 €
	Walloon Brabant	12,71 €
	Hainaut	13,41 €
	Liège	10,87 €
	Namur	12,44 €
	Luxembourg	8,83 €
Regions	Flanders	13,28 €
	Brussels	11,90 €
	Wallonia	12,13 €
TOTAL		12,79 €

Regional and provincial distribution of standardised expenditure (2021)

Radiotherapy - Radiotherapy (Adjusted)

Nomenclature	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Average annual growth rate
444113-444124	744,13	751,13	759,14	768,52	773,11	770,43	758,22	769,80	768,00	775,31	780,70	0,48%
444135-444146	1.769,47	1.806,08	1.824,58	1.847,64	1.855,95	1.837,71	1.798,67	1.825,51	1.830,70	1.857,58	1.856,02	0,48%
444150-444161	2.357,42	2.386,37	2.411,62	2.445,39	2.459,87	2.458,91	2.410,58	2.439,33	2.445,81	2.472,86	2.495,98	0,57%
444172-444183	2.971,01	2.998,68	3.035,17	3.069,89	3.080,30	3.079,19	3.027,86	3.069,08	3.075,57	3.102,61	3.126,71	0,51%
444194-444205	440,65	441,98	446,46	455,33	458,27	460,81	453,72	457,81	456,69	464,87	468,49	0,61%
444216-444220	776,51	841,01	817,13	817,92	1.049,34	1.138,18	1.037,40	1.129,23	1.112,61	1.100,96	1.324,78	5,49%
444231-444242	531,09	518,20	520,67	518,63	533,98	522,46	535,03	511,00	531,69	535,17	548,11	0,32%
444253-444264	1.875,50	1.895,00	1.966,92	2.035,15	2.140,27	2.139,61	1.680,43	1.555,45	1.534,73	1.514,43	1.542,23	-1,94%
444290-444301	1.290,63	1.225,94	1.332,09	1.394,98	1.427,21	1.412,49	1.410,53	1.460,25	1.425,28	1.408,81	1.455,84	1,21%
444312-444323	836,38	866,92	870,51	881,54	911,93	903,76	874,46	874,10	888,42	863,16	837,26	0,01%
444334-444345	628,85	623,48	599,83	690,06	632,51	627,82	588,07	529,83	561,29	517,09	529,60	-1,70%
444636-444640	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	3.160,69	3.201,11	1,28%
444651-444662	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	3.141,44	3.147,26	0,19%
444673-444684	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	3.121,37	3.135,55	0,45%
444695-444706	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	3.124,27	3.114,07	-0,33%
444710-444721	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	3.267,63	3.230,80	-1,13%

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

4. KEY DATA SUMMARY

		TOTAL
PROVIDERS & PRESCRIBERS		
Main healthcare providers:	Radiotherapy	99,80%
Main prescribers:	Not applicable	-
RATE OF USE		
Average number of interventions (per year)		33.867
Standardised rate of use (per 100 000 insured persons)		295,39
≥ 2 occurrences per patient (2019) ⁴		16,2%
Percentage of outpatient care		89,55%
POPULATION		
Median age		68 years
Max/min ratio ⁵ of the median age (by district)		1,08
Percentage of women		54,37%
Ratio Preferential rate/General rate		1,3
TRENDS		
Trend (2011-2021)		0,57%
Trend ⁶ (2011-2019)		0,40%
Trend ⁶ (2019-2021)		1,25%
GEOGRAPHICAL VARIATIONS		
Coefficient of variation ⁶ (2011-2013)		10,61
Coefficient of variation ⁶ (2019-2021)		15,57
Max/min ⁵ Ratio of number of interventions ⁶ (per 100 000 insured persons, by region)		1,11
Max/min Ratio ⁵ of number of interventions (per 100 000 insured persons, by district)		2,34
DIRECT EXPENDITURE		
Average annual expenditure		146.586.881 €
Average annual expenditure per insured		12,79 €
Max/Min Ratio ⁵ of expenditure per insured (by region)		1,12
Max/Min Ratio ⁵ of expenditure per insured (by district)		2,72
Average cost of interventions		4328,28 €
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). 'NA' indicates the test is not applicable.

5. APPENDICES

A. Analysis of variance (ANOVA), except Brussels

Statistical significance of the differences observed in 2021		
<i>By region?</i>	No	NS
<i>By sex?</i>	No	NS
<i>By reimbursement scheme?</i>	Yes	***
<i>By sex and per region?</i>	No	NS
<i>By reimbursement scheme and per region?</i>	No	NS
<i>By sex and per reimbursement scheme?</i>	No	NS
<i>By sex and reimbursement scheme and per region?</i>	No	NS

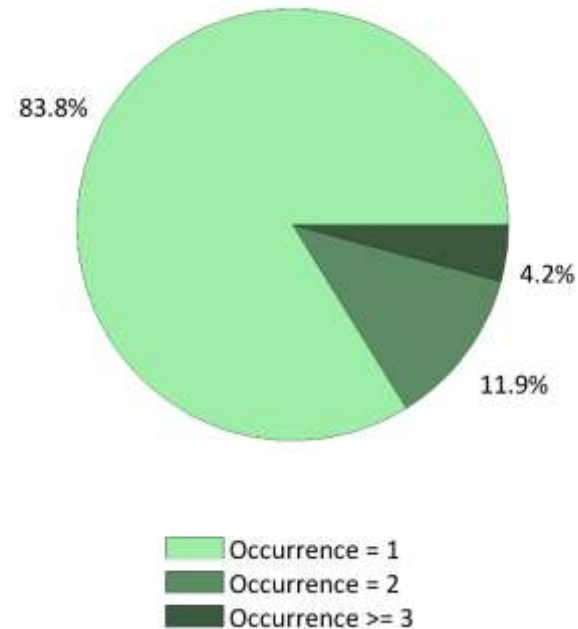
In order to be able to assess the significance of the observed differences, a linear mixed **ANOVA** model was fitted to the data of all districts of the Walloon and Flemish regions, after standardising for age. The model has region, sex and reimbursement scheme as fixed effects and also contains all 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 $\leq 0,05$ / ** P-value $\leq 0,01$ / *** P-value $\leq 0,001$ or NS for a non-significant result.

B. Frequency of practice occurrences

Frequency	Per year	Per day
2 occurrences	11,9%	6,0%
≥ 3 occurrences	4,2%	0,9%
≥ 2 occurrences	16,2%	6,9%



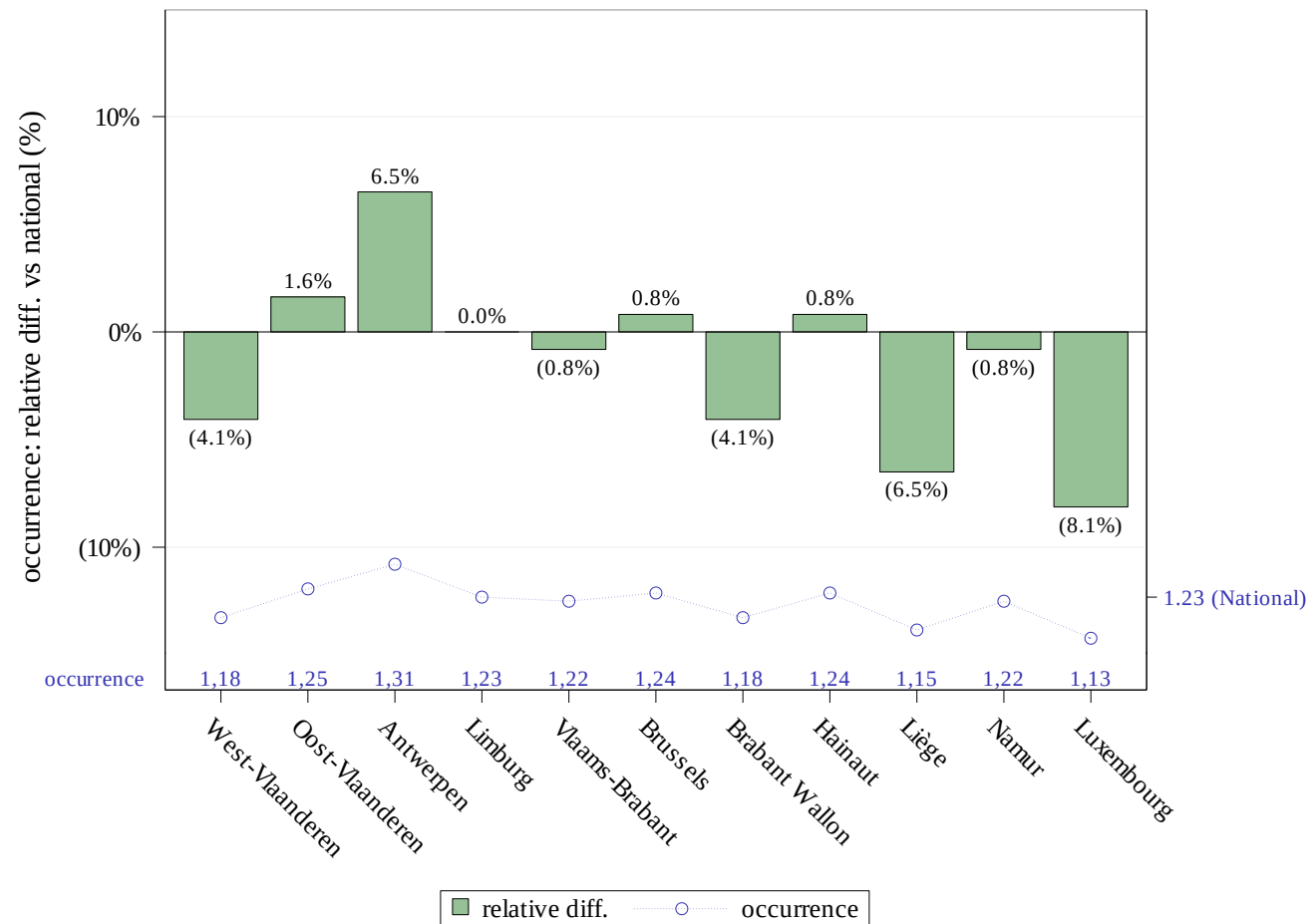
Distribution of practice recurrences per year (2019)

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.

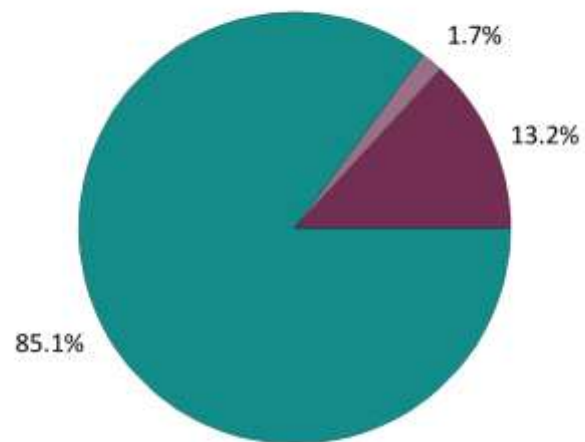
These frequency analyses of occurrences are carried out over the year **2019** using the following databases: Documents P, ADH and SHA.

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



Frequency of practice occurrences by province and variation vs national value (2019)

C. Patient care settings



■ Inpatient
■ Outpatient (clinic)
■ One-day

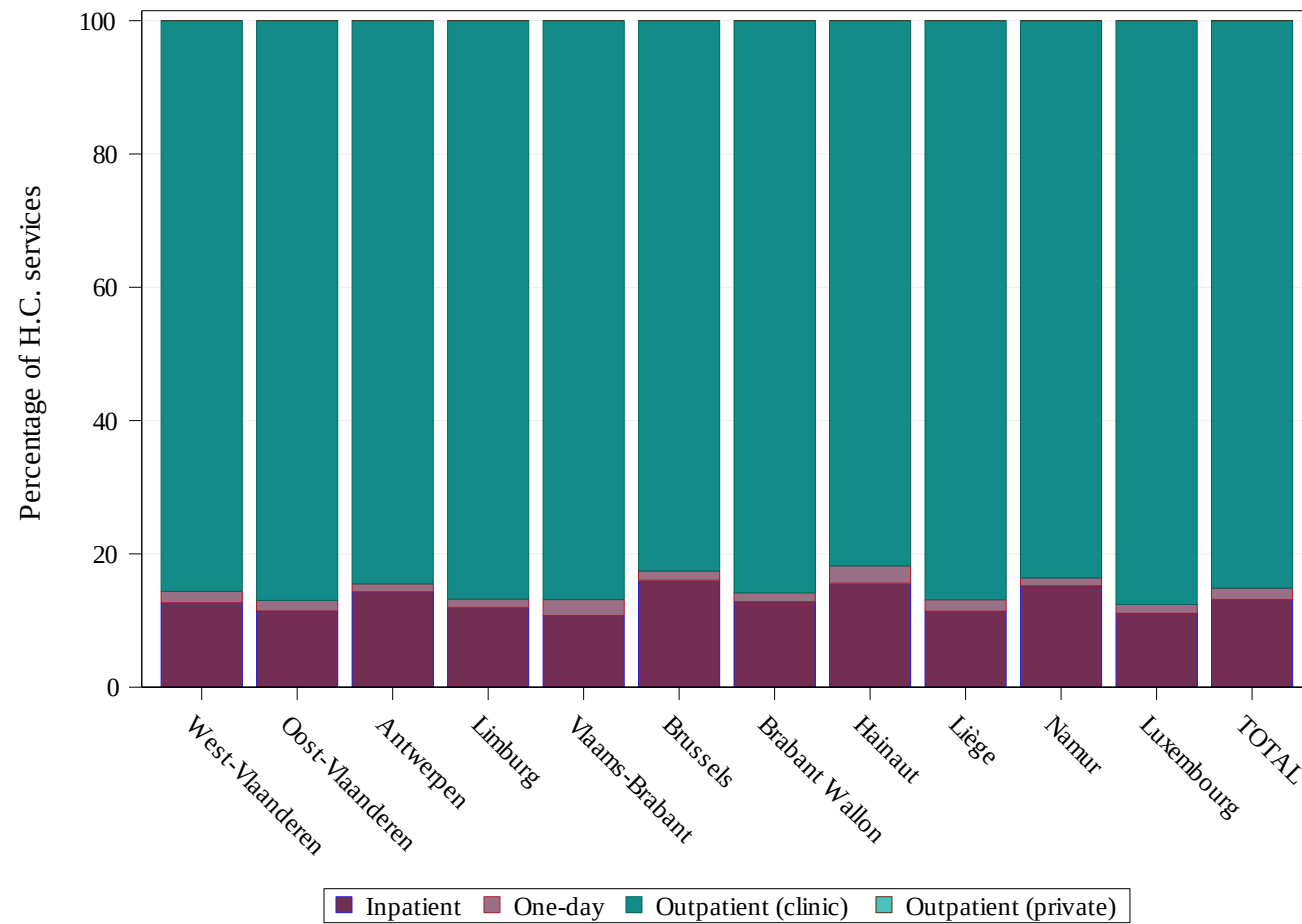
Distribution of patient care settings in 2019

Care Settings	
Outpatient (private)	0,0%
Outpatient (polyclinic)	85,1%
(Day) Hospital	1,7%
Hospital (stay)	13,2%

In addition to the chapter on [standardised inpatient and outpatient use rates](#) (see p.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 **2019** using the following databases: Documents P, ADH and SHA.

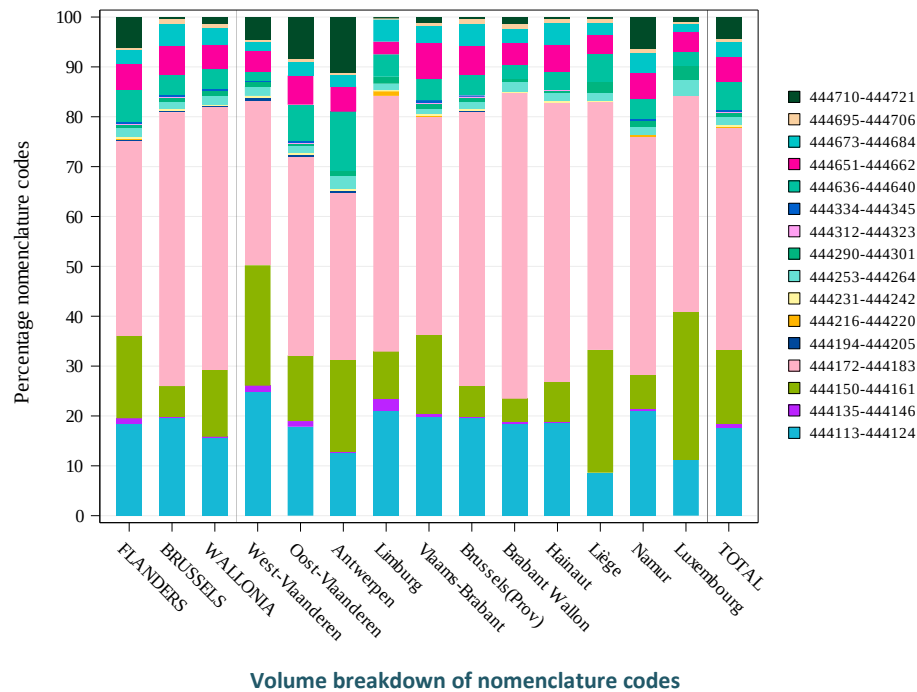
Values « **n.a.** » are indicated if the data were not available at the time of this report.



Distribution of patient care settings by province (2019)

D. Coding variations and practice alternatives

→ Variations in coding:



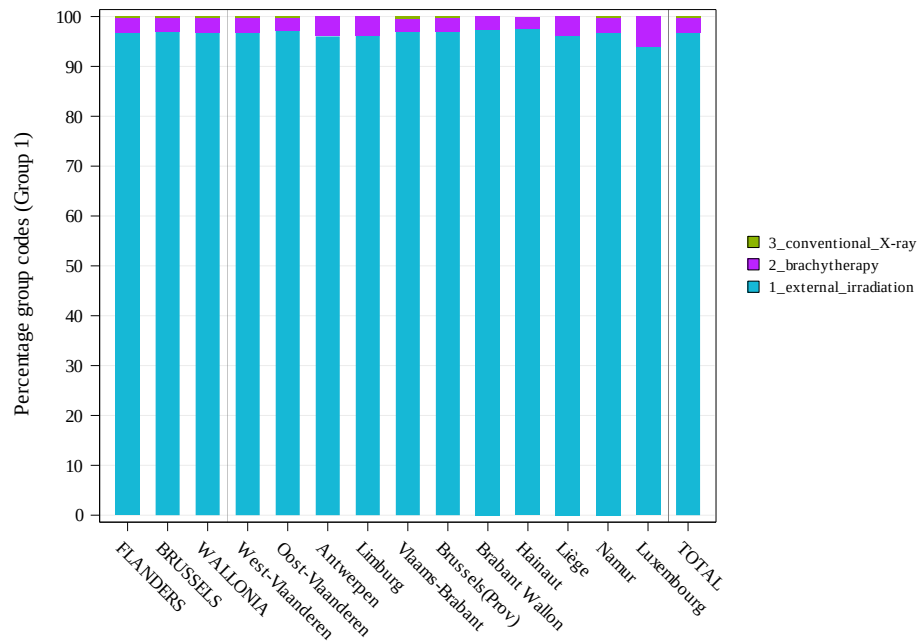
[Due to the large number of nomenclature codes selected for this analysis, we cannot include them in the legend here. We therefore invite you to read the details concerning them on page 4 of this report.]

Significance	By region	By province
Use of Nomenclature codes ⁷	***	***

⁷ 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.

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.

→ Variations in practice alternatives (Group 1):



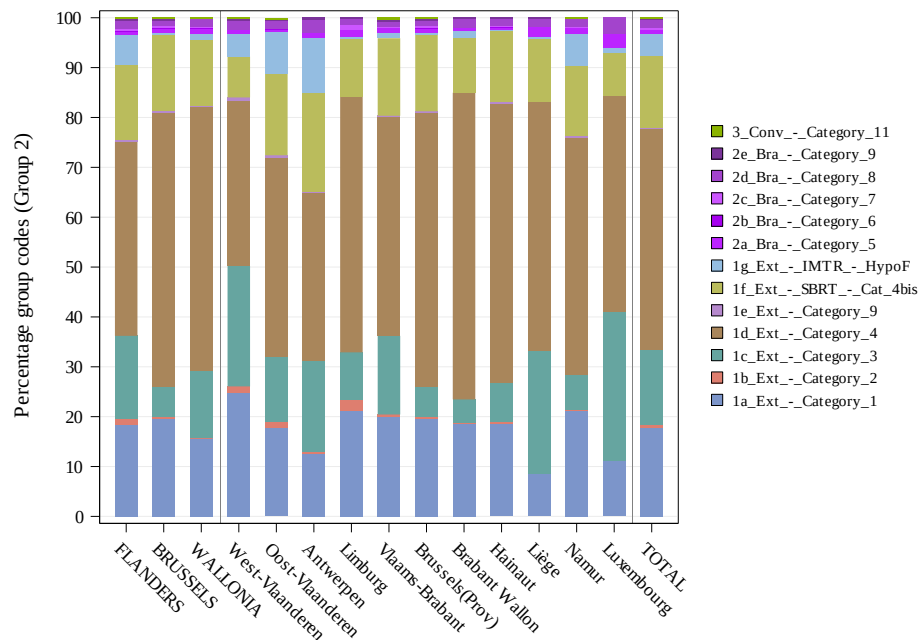
Breakdown of choice for practice alternatives

Significance	By region	By province
Choice of Practice alternatives	***	***

Combined codes	Groupings
444113-444124	1_external_irradiation
444135-444146	1_external_irradiation
444150-444161	1_external_irradiation
444172-444183	1_external_irradiation
444194-444205	1_external_irradiation
444216-444220	2_brachytherapy
444231-444242	2_brachytherapy
444253-444264	2_brachytherapy
444290-444301	2_brachytherapy
444312-444323	2_brachytherapy
444334-444345	3_conventional_X-ray
444636-444640	1_external_irradiation
444651-444662	1_external_irradiation
444673-444684	1_external_irradiation
444695-444706	1_external_irradiation

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.

→ Variations in practice alternatives (Group 2) :

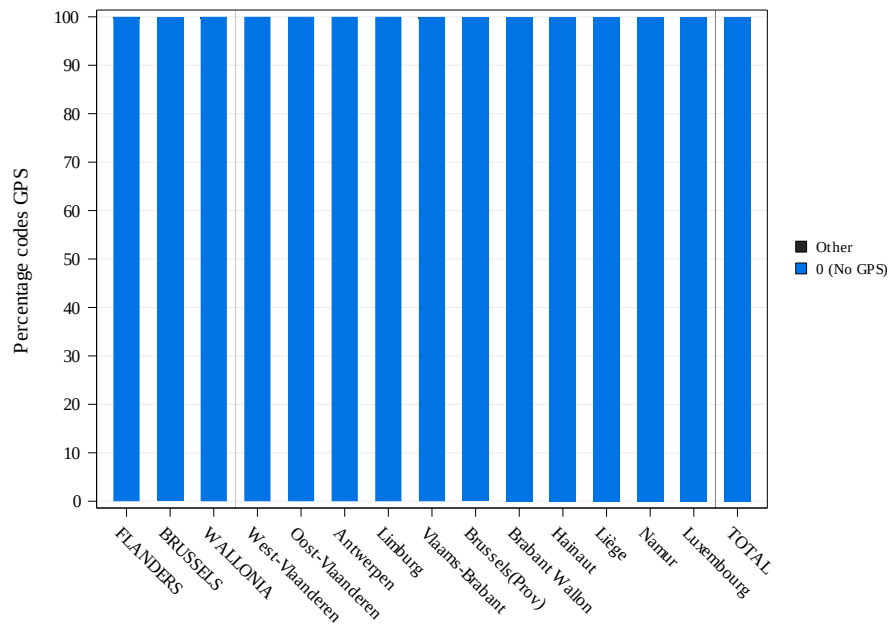


Breakdown of choice for practice alternatives

Significance	By region	By province
Choice of Practice alternatives	***	***

Combined codes	Groupings
444113-444124	1a_Ext_-_Category_1
444135-444146	1b_Ext_-_Category_2
444150-444161	1c_Ext_-_Category_3
444172-444183	1d_Ext_-_Category_4
444194-444205	1e_Ext_-_Category_9
444216-444220	2c_Bra_-_Category_7
444231-444242	2e_Bra_-_Category_9
444253-444264	2d_Bra_-_Category_8
444290-444301	2a_Bra_-_Category_5
444312-444323	2b_Bra_-_Category_6
444334-444345	3_Conv_-_Category_11
444636-444640	1f_Ext_-_SBRT_-_Cat_4bis
444651-444662	1f_Ext_-_SBRT_-_Cat_4bis
444673-444684	1f_Ext_-_SBRT_-_Cat_4bis
444695-444706	1f_Ext_-_SBRT_-_Cat_4bis
444710-444721	1g_Ext_-_IMTR_-_HypoF

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



Pseudocodes	Label
-------------	-------

Breakdown by volume of pseudocodes of GPS

Significance	By region	By province
Use of Global Payment with Standardisation ⁸	***	*

⁸ 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.