

## 1.1. Caesarean sections (QA8)

### 1.1.1. Documentation sheet

<b>Description</b>	Number of caesarean sections per 1000 live births
<b>Calculation</b>	The number of caesarean sections (x1000), divided by all live births. The distribution of caesareans by categories, using Robson classification, is also presented.
<b>Rationale</b>	<p>Since 1985 and up to 2015, the international healthcare community have considered that the C-sections rate should not be higher than 10-15%. But in 2015, WHO stated that “<i>every effort should be made to provide caesarean sections to women in need, rather than striving to achieve a specific rate</i>”.<sup>1</sup> Caesarean delivery rates are still increasing in most European countries. Reasons for the increase include, among others, the increase in maternal age, and obesity.</p> <p>While caesarean delivery is required in some circumstances, the benefits of caesarean versus vaginal delivery for normal uncomplicated deliveries continue to be debated. There is some evidence from observational studies of increased maternal mortality, maternal and infant morbidity, and increased complications for subsequent deliveries. Nevertheless, due to a lack of trials on the topic, the Cochrane Collaboration review on caesarean section for non-medical reasons at term could not reach strong conclusions on the best medical indications.<sup>2</sup> These risks, combined with the greater financial cost (the average cost associated with a caesarean section is at least two times greater than a normal delivery in many OECD countries), raise questions about the appropriateness of some caesarean delivery that may not be medically required.<sup>3</sup></p> <p>These concerns are translated into (professional) guidelines. In 2018, the WHO published recommendations for non-clinical interventions for women, healthcare professionals, health organisations, facilities or systems to reduce unnecessary caesarean sections.<sup>4</sup> Professional associations of obstetricians and gynaecologists in countries such as Canada encourage the promotion of normal childbirth without intervention such as caesarean sections.<sup>5</sup> In its 2021 guidelines (updated in 2023), the National Institute for Health Care Excellence (NICE, UK) sets out a clear list of indications for scheduled caesarean sections (such as Placenta previa or Mother-to-child transmission of maternal infection risks).<sup>6</sup> Guideline from the French Health Authority recommends informing the patient on the increased risk of complications for future pregnancy after a caesarean section.<sup>7</sup> In Belgium, KCE recommends raising awareness of gynaecologists and obstetricians regarding the consequences of the caesarean section without medical indication, especially for nulliparous with single cephalic pregnancy beyond 37 weeks.<sup>8</sup></p> <p>Categorisation of caesarean sections has often been done using its indications (why the C-section was being performed). However, the lack of uniform definitions for most common indications has resulted in poor reproducibility and difficult national and international comparison.<sup>9, 10</sup> In its last statement, the World Health Organization (WHO) recommends using Robson classification.<sup>1</sup> This system classifies women admitted for delivery according to obstetric characteristics that are generally routinely collected in most maternities.<sup>11</sup></p>
<b>Data source</b>	SPF Public health (Hospital administrative discharge data (RHM-MZG)) and OECD Health Statistics for international comparison. Additional sources: CEpiP and SPE for the Robson categories.

<b>Technical definitions</b>	Numerator: ICD9-CM codes: 74.0 Classical caesarean section; 74.1 Low cervical caesarean section; 74.2 Extraperitoneal caesarean section; 74.4 Caesarean section of other specified type; 74.99 Other caesarean section of unspecified type. Robson classification is detailed in Table 5.
<b>International comparability</b>	Same definition of ICD9 codes, but not all countries use the same definition of live births.
<b>Limitations</b>	Change from ICD-9 to ICD-10 classification has resulted in a break in the series of RHM – MZG data from 2016 on (and no 2015 data available). Since Robson categories 2 and 4 may represent a large proportion of the obstetric population, WHO suggests that these categories could be subdivided between induced labour (categories 2a and 4a) and pre-labour caesarean (categories 2b and 4b). These subcategories can be important to understand how differences in clinical practice (rates of induced labour or pre-labour caesarean) contribute to the overall rates of caesarean. <sup>12</sup> However, these subcategories are not routinely recorded in Belgium.
<b>Dimension</b>	Quality (appropriateness); variability of care.
<b>Related indicator</b>	None
<b>Reviewer</b>	Pascale Jonckheer (KCE)

### 1.1.2. Results

#### Rate of caesarean sections

In Belgium in 2021, the rate of caesarean section is 217 per 1 000 live births which corresponds to an increase of 11.3% with respect to the rate of 2010 (194 per 1 000 live births) (Figure 1, Table 1).

Regional differences exist for this indicator: the rate of caesarean section is 224 (per 1 000 live births) in Wallonia, 218 (per 1 000 live births) in Flanders and 201 (per 1 000 live births) in Brussels in 2021 (Figure 1, Table 1).

The number of caesarean sections (per 1 000 live births) increased in every Belgian region from 2010 to 2021 (average annual increase of 2.10 caesarean sections per 1 000 live births in Wallonia, 2.60 in Flanders and 1.50 in Brussels) (Table 1).

#### Caesarean sections by Robson classification

The definition of the Robson classification is available in Table 5. Not all of those Robson categories are equally frequent. Therefore some of the groups contribute more than other categories to the total number of caesarean. Figure 2 shows the contribution of each category to the total proportion of caesarian sections performed by regions.

In 2021, in all Belgian regions, the highest proportions of caesarean sections were performed in women with transverse and oblique lies (Robson 9) with almost 100% of deliveries by caesarean in these situations, followed by nulliparous singleton breech births (Robson 6) and multiparous singleton breech births (Robson 7) (Table 2; Table 3; Table 4). Although Robson categories 9, 6 and 7 show higher caesarean rates, they represent a small part of the total number of deliveries, therefore not contributing much to the total caesarean rates.

In 2021, in all Belgian regions, lower proportions of caesarean sections were attributed to Robson 3 classes. It means that multiparous women without a previous uterine scar with a single cephalic pregnancy,  $\geq 37$  weeks gestation in spontaneous labour (Robson 3); multiparous women without a previous uterine scar, with a single cephalic pregnancy,  $\geq 37$  weeks gestation who

either had labour induced or were delivered by caesarean section before labour (Robson 4); or nulliparous women with a single cephalic pregnancy,  $\geq 37$  weeks gestation in spontaneous labour (Robson 1) had proportionally less caesarean sections than the women in the other Robson classes. On the other hand, Robson classes 1, 3 and 4 are the most frequent in the Belgian population and also those with the lowest caesarean rates, therefore not contributing much to the total caesarean rates (Table 2; Table 3; Table 4).

In 2021, as shown in Figure 2, the Robson categories that contribute the most to the Belgian caesarean section rate are multiparous women with at least one previous uterine scar, with single cephalic pregnancy,  $\geq 37$  weeks gestation (Robson 5) and Nulliparous women with a single cephalic pregnancy,  $\geq 37$  weeks gestation who either had labour induced or were delivered by caesarean section before labour (Robson 2). Both categories combine a high frequency in pregnancy and a relative high rate of caesarean.

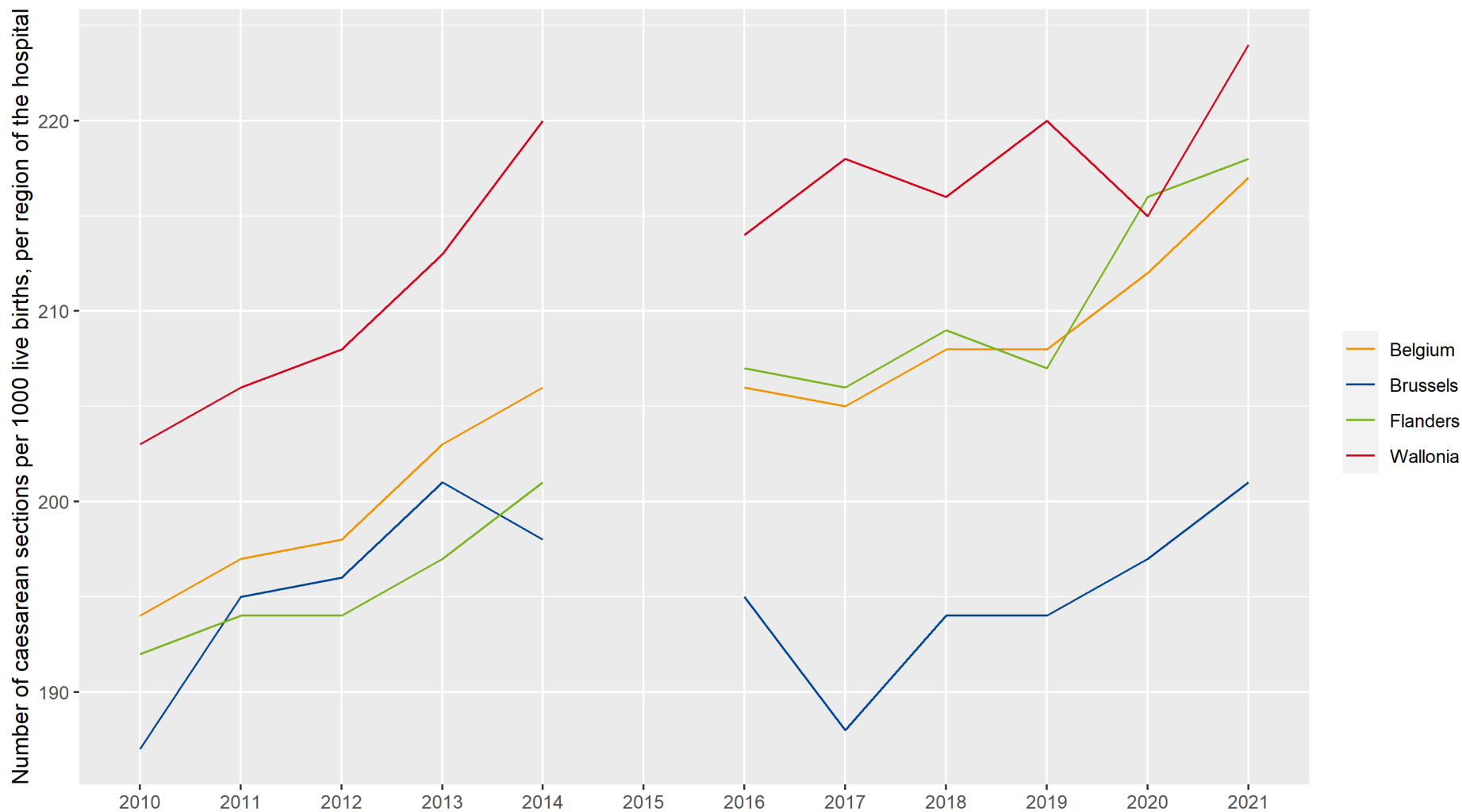
C-section rate among multiparous women with at least one previous uterine scar, with single cephalic pregnancy,  $\geq 37$  weeks gestation (Robson 5) is above the upper bound of the expected range of 50-60% according to WHO (see Table 5)<sup>12</sup> in Wallonia (in 2021, 63.3% in Wallonia, 58.8% in Brussels, and 58.0% in Flanders).<sup>12</sup> Hence, repeated C-sections contribute largely to the overall rate of C-section (Wallonia: 29.8%; Brussels: 30.8%; Flanders: 29.8%) (Table 2; Table 3; Table 4).

#### International comparison

In 2020, Belgium had a lower caesarean section rate (214 caesarean section rate per 1 000 live births) than the average EU-14 (243 caesarean section rate per 1 000 live births) and the average EU-27 (252 caesarean section rate per 1 000 live births) and was classified seventh in EU-27, i.e. between Denmark (203 caesarean section rate per 1 000 live births) and Slovenia (217 caesarean sections per 1 000 live births) (Figure 3).

Despite a slight increase in the caesarean section rate since 2010, Belgium always performed better than the average EU-14 from 2010 to 2020 for this indicator (Figure 4).

Figure 1 – Number of caesarean sections per 1 000 live births, per region of the hospital, 2010-2021



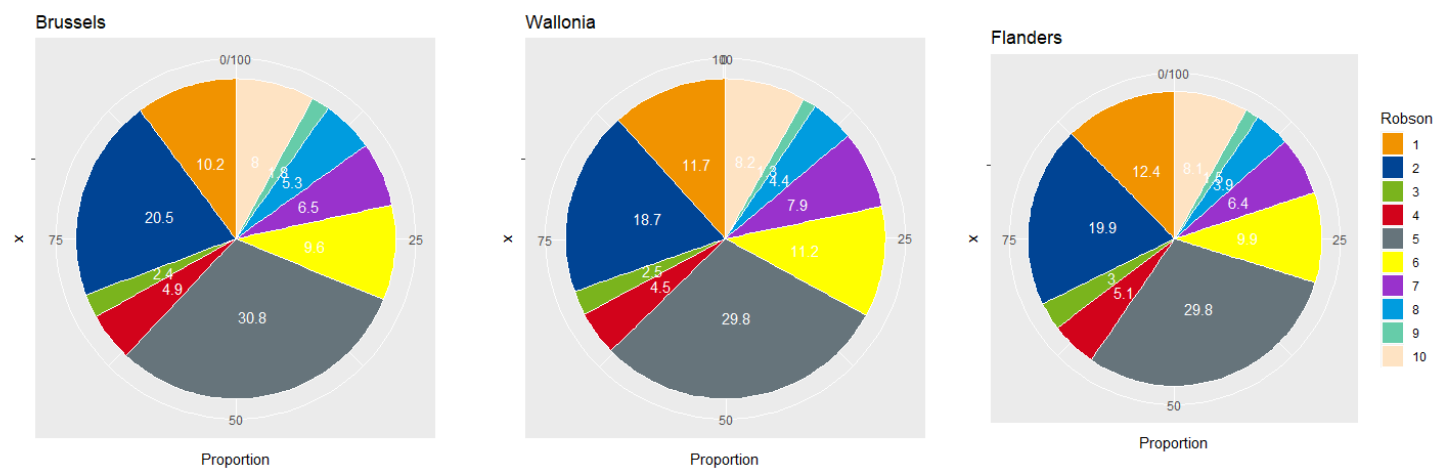
Data source: SPF-FOD; Figure: KCE

**Table 1 – Number of caesarean sections per 1 000 live births, per region of the hospital, 2010-2021**

Region	2010	2011	2012	2013	2014	2016	2017	2018	2019	2020	2021	Average annual difference
<b>Belgium</b>	194	197	198	203	206	206	205	208	208	212	217	2.2
<b>Brussels</b>	187	195	196	201	198	195	188	194	194	197	201	1.5
<b>Flanders</b>	192	194	194	197	201	207	206	209	207	216	218	2.6
<b>Wallonia</b>	203	206	208	213	220	214	218	216	220	215	224	2.1

2015: Data not available. Data source: SPF-FOD

**Figure 2 – Distribution of the Robson categories among caesarean sections, by region, 2021**



Definition of the Robson classification is available in Table 2; Data source: CEpiP (BRU&WAL) & SPE (FL); Calculation: KCE

**Table 2 – Caesarean section, by Robson classification, Brussels, 2021, N = 22 178**

Robson	Number of caesarean sections /Total number of deliveries	Relative size of the Robson category on total deliveries	Proportion of caesarean section	Contribution to the overall deliveries	Contribution to the overall caesarean sections
1 Nulliparous women with a single cephalic pregnancy, ≥37 weeks gestation in spontaneous labour	453/4 790	21.6%	9.5%	2.0%	10.2%
2 Nulliparous women with a single cephalic pregnancy, ≥37 weeks gestation who either had labour induced or were delivered by caesarean section before labour	911/3 123	14.1%	29.2%	3.3%	20.5%
3 Multiparous women without a previous uterine scar, with a single cephalic pregnancy, ≥37 weeks gestation in spontaneous labour	107/6 301	28.4%	1.7%	0.5%	2.4%
4 Multiparous women without a previous uterine scar, with a single cephalic pregnancy, ≥37 weeks gestation who either had labour induced or were delivered by caesarean section before labour	216/3 043	13.7%	7.1%	1.0%	4.9%
5 All multiparous women with a least one previous uterine scar, with a single cephalic pregnancy ≥37 weeks gestation	1 371/2 332	10.5%	58.8%	6.2%	30.8%
6 All nulliparous women with a single breech pregnancy	429/507	2.3%	84.6%	1.9%	9.6%
7 All multiparous with a single breech pregnancy, including women with previous uterine scars	289/397	1.8%	72.8%	1.3%	6.5%
8 All women with multiple pregnancies, including women with previous uterine scars	237/414	1.9%	57.2%	1.1%	5.3%
9 All women with a single pregnancy with a transverse or oblique lie, including women with previous uterine scars	79/79	0.4%	100.0%	0.4%	1.8%
10 All women with a single cephalic pregnancy <37 weeks gestation, including women with previous scars	354/1 192	5.4%	29.7%	1.6%	8.0%
<b>TOTAL*</b>	<b>4 446/22 178</b>	<b>100.0%</b>		<b>20.1%</b>	<b>4 446</b>

\* Unknown for 90 deliveries (0.4% of the total number of deliveries). Data source: CEpiP; Calculation: KCE

**Table 3 – Caesarean section, by Robson classification, Wallonia, 2021, N = 34 379**

Robson	Number of caesarean sections /Total number of deliveries	Relative size of the Robson category on total deliveries	Proportion of caesarean section	Contribution to the overall deliveries	Contribution to the overall caesarean sections
1 Nulliparous women with a single cephalic pregnancy, ≥37 weeks gestation in spontaneous labour	898/7 761	22.6%	11.6%	2.6%	11.7%
2 Nulliparous women with a single cephalic pregnancy, ≥37 weeks gestation who either had labour induced or were delivered by caesarean section before labour	1 433/4 784	13.9%	30.0%	4.2%	18.7%
3 Multiparous women without a previous uterine scar, with a single cephalic pregnancy, ≥37 weeks gestation in spontaneous labour	192/8 862	25.8%	2.2%	3.3%	2.5%
4 Multiparous women without a previous uterine scar, with a single cephalic pregnancy, ≥37 weeks gestation who either had labour induced or were delivered by caesarean section before labour	343/4 978	14.5%	6.9%	1.0%	4.5%
5 All multiparous women with a least one previous uterine scar, with a single cephalic pregnancy ≥37 weeks gestation	2 285/3 612	10.5%	63.3%	6.6%	29.8%
6 All nulliparous women with a single breech pregnancy	858/903	2.6%	95.0%	2.5%	11.2%
7 All multiparous with a single breech pregnancy, including women with previous uterine scars	603/725	2.1%	83.2%	1.8%	7.9%
8 All women with multiple pregnancies, including women with previous uterine scars	337/553	1.6%	60.9%	1.0%	4.4%
9 All women with a single pregnancy with a transverse or oblique lie, including women with previous uterine scars	101/102	0.3%	99.0%	0.3%	1.3%
10 All women with a single cephalic pregnancy <37 weeks gestation, including women with previous scars	629/2 117	6.2%	29.7%	1.8%	8.2%
<b>TOTAL*</b>	<b>7 679/34 397</b>	<b>100.00%</b>		<b>22.4%</b>	

\* Unknown for 84 deliveries (0.2% of the total number of deliveries). Data source: CEpiP; Calculation: KCE

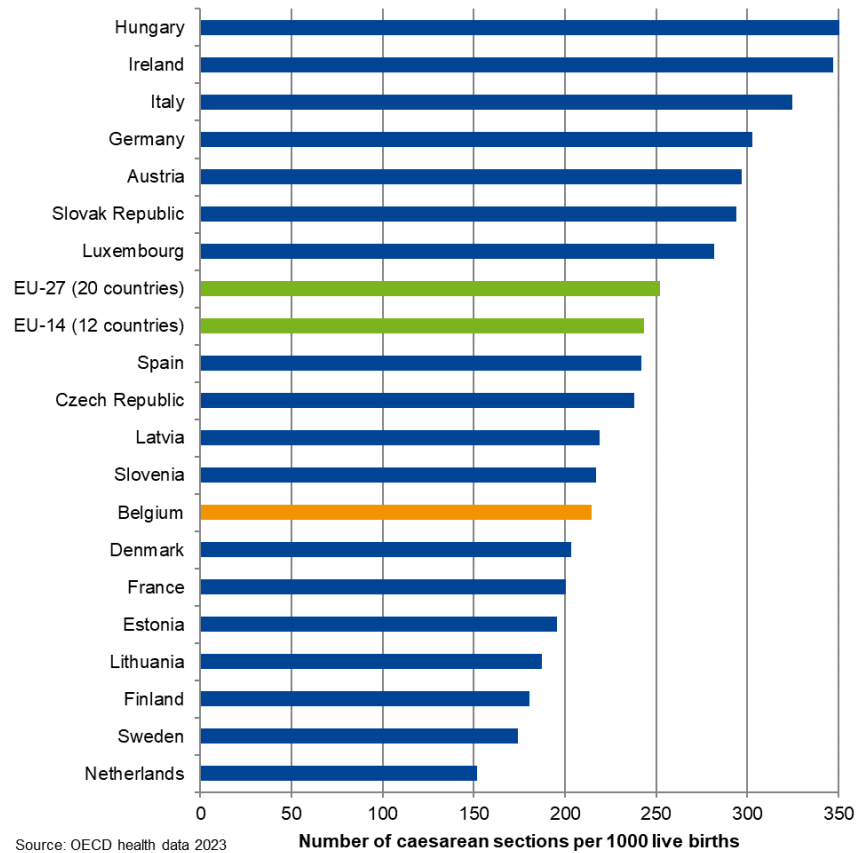
**Table 4 – Caesarean section, by Robson classification, Flanders, 2021, N = 63 272**

Robson	Number of caesarean sections /Total number of deliveries	Relative size of the Robson category on total deliveries	Proportion of caesarean section	Contribution to the overall deliveries	Contribution to the overall caesarean sections
1 Nulliparous women with a single cephalic pregnancy, ≥37 weeks gestation in spontaneous labour	1 729/16 160	25.5%	10.7%	2.7%	12.4%
2 Nulliparous women with a single cephalic pregnancy, ≥37 weeks gestation who either had labour induced or were delivered by caesarean section before labour	2 778/8 552	13.5%	13.5%	4.4%	19.9%
3 Multiparous women without a previous uterine scar, with a single cephalic pregnancy, ≥37 weeks gestation in spontaneous labour	417/ 16 457	26.0%	2.5%	1.2%	3.0%
4 Multiparous women without a previous uterine scar, with a single cephalic pregnancy, ≥37 weeks gestation who either had labour induced or were delivered by caesarean section before labour	715/7 595	12.0%	9.4%	5.1%	5.1%
5 All multiparous women with a least one previous uterine scar, with a single cephalic pregnancy ≥37 weeks gestation	4 159/7 175	11.3%	58.0%	6.6%	29.8%
6 All nulliparous women with a single breech pregnancy	1 389/1 468	2.3%	94.6%	2.2%	9.9%
7 All multiparous with a single breech pregnancy, including women with previous uterine scars	893/1 003	1.6%	89.0%	1.4%	6.4%
8 All women with multiple pregnancies, including women with previous uterine scars	541/948	1.5%	57.1%	0.9%	3.9%
9 All women with a single pregnancy with a transverse or oblique lie, including women with previous uterine scars	210/210	0.3%	100.0%	0.3%	1.5%
10 All women with a single cephalic pregnancy <37 weeks gestation, including women with previous scars	1 136/3 710	5.9%	30.6%	1.8%	8.1%
<b>TOTAL</b>	13 967 <sup>§</sup> /63 272	100.00%		22.1%	

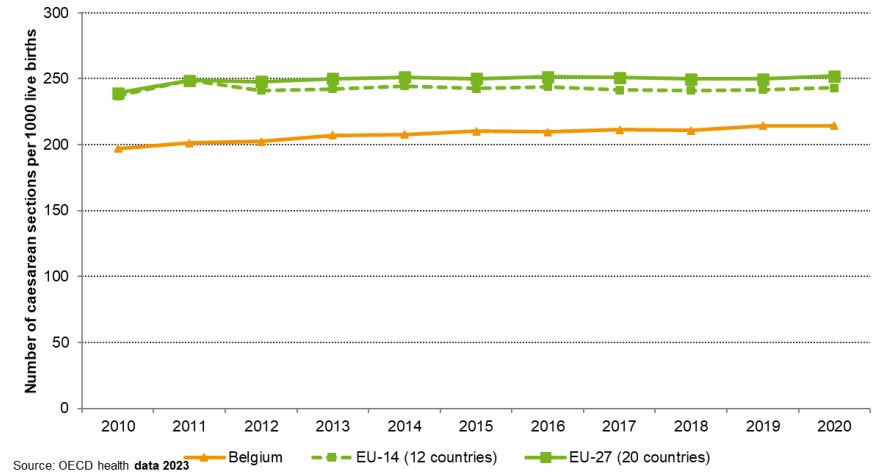
\* Data source & calculation: SPE; <sup>§</sup>Number of unclassifiable cases due to missing values: n = 62



**Figure 3 – Number of caesarean sections per 1 000 live births, by EU-27 country, 2020**



**Figure 4 – Number of caesarean sections per 1 000 live births, by EU-14\* country, 2000-2020**



\* 12 countries: Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Luxembourg, Netherlands, Spain, Sweden

**Table 5 – Robson classification**

		<b>WHO recommendations<sup>12</sup>, caesarean rate</b>
<b>1</b>	Nulliparous women with a single cephalic pregnancy, ≥37 weeks gestation in spontaneous labour	Rates under 10% are achievable
<b>2</b>	Nulliparous women with a single cephalic pregnancy, ≥37 weeks gestation who either had labour induced (2a) or were delivered by caesarean section before labour (2b)	Consistently around 20-35%
<b>3</b>	Multiparous women without a previous uterine scar, with a single cephalic pregnancy, ≥37 weeks gestation in spontaneous labour	Normally, no higher than 3.0%
<b>4</b>	Multiparous women without a previous uterine scar, with a single cephalic pregnancy, ≥37 weeks gestation who either had labour induced (4a) or were delivered by caesarean section before labour (4b)	It rarely should be higher than 15%
<b>5</b>	All multiparous women with a least one previous uterine scar, with a single cephalic pregnancy ≥37 weeks gestation	Rates of 50-60% are considered appropriate provided you have good maternal and perinatal outcome
<b>6</b>	All nulliparous women with a single breech pregnancy	
<b>7</b>	All multiparous with a single breech pregnancy, including women with previous uterine scars	
<b>8</b>	All women with multiple pregnancies, including women with previous uterine scars	It is usually around 60%
<b>9</b>	All women with a single pregnancy with a transverse or oblique lie, including women with previous uterine scars	
<b>10</b>	All women with a single cephalic pregnancy <37 weeks gestation, including women with previous scars	In most populations it is usually around 30%



### Key points

- **In 2021, the caesarean section rate is 217 per 1 000 live births which corresponds to an increase of 11.3% with respect to the rate of 2010 (194 per 1 000 live births).**
- **The caesarean section rate is higher than the 10-15% recommended by the WHO.**
- **Globally, the caesarean section rate is still increasing in every Belgian region since 2010.**
- **Repeated C-sections (Robson 5: multiparous women with a least one previous uterine scar, with a single cephalic pregnancy  $\geq 37$  weeks gestation) contribute the most to the total caesarean rate.**
- **Despite an increase in the caesarean rate over the years, Belgium performed better than the average EU-14 and EU-27 from 2010 to 2020 for this indicator.**

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