



4

MODE OF DELIVERY

4. MODE OF DELIVERY

CORE

Mode of delivery according to parity, plurality, presentation, previous caesarean section, and gestational age (C10)

RECOMMENDED HEALTHCARE INDICATORS NOT INCLUDED IN THIS REPORT

Percentage of all pregnancies following treatment for subfertility (R13)

Distribution of timing of first antenatal visit (R14)

Distribution of births by mode of onset of labour (R15)

Distribution of place of birth by volume of deliveries (R16)

Percentage of very preterm births delivered in units without a neonatal intensive care unit (R17)

Episiotomy rate (R18)

Percentage of births without obstetric intervention (R19)

Percentage of infants breast fed at birth (R20)

The Euro-Peristat indicator list includes one core indicator of health care, which is mode of delivery, as well as eight other recommended indicators, as shown above. Only mode of delivery is included in this report on core indicators.

Pregnancy is not an illness, but a physiological process associated with health risks for some women and babies. When all pregnant women have access to comprehensive antenatal care and deliveries are attended by clinically qualified staff, as is the case in European countries, most women and newborns will not experience complications. A major concern in these and similar countries is to guarantee an adequate level of clinical safety for this group while avoiding over-medicalisation of the pregnancy and, in particular, procedures with side effects.

The development of systematic reviews and the promotion of the concept of evidence-based health care in the field of maternity care began in the late 1980s. The tradition of evaluating clinical practices and working to find a balance between insufficient or excessive intervention might have been expected to lead to similarities between the patterns of maternity care. In Europe, however, Euro-Peristat and many other European projects have documented wide diversity in approaches to providing care during pregnancy, childbirth, and the postpartum period. Mode of delivery provides a clear-cut example of these differences. By collecting this indicator by subgroups defined by their levels of risk, as recommended by Euro-Peristat, it is possible to show that differences in the childbearing population are not major drivers of these differences.



C10 MODE OF DELIVERY

JUSTIFICATION

Caesarean delivery can be a lifesaving procedure for both mother and child. Ability to provide access to timely caesarean delivery in emergency situations is a key quality indicator for maternity care services.¹ However, in the absence of maternal and fetal complications, vaginal delivery is associated with less maternal morbidity and is at least as safe as caesarean delivery for the newborn.^{2,3} It is also the preferred option for a very substantial majority of pregnant women. Furthermore, caesarean delivery increases the risks of some pregnancy complications in subsequent pregnancies, including placenta accreta, placenta praevia, placental abruption, and stillbirth.⁴ There is also a growing body of research showing that caesarean delivery is associated with elevated risks of asthma and obesity for the child.⁴ The large rise in the caesarean rate since the 1970s is therefore a long-standing and continuing cause for concern.⁵⁻⁷

In 1985, a World Health Organization conference concluded that the caesarean delivery rate should be no more than 10-15%.⁸ Recently, WHO updated this statement to recommend that “Every effort should be made to provide caesarean sections to women in need, rather than striving to achieve a specific rate.” Nonetheless, after a review of the literature on country-level associations between caesarean rates and perinatal mortality, the WHO expert group continued to support the previous statement that increases in the caesarean delivery rate over the threshold of 9-16% do not appear to be related to better population health outcomes.⁹ However, they also conclude that further research on perinatal morbidity is needed.

Caesarean rates vary widely in participating countries, from 15% to over 40%.¹⁰ Countries also vary in their use of operative vaginal delivery, either with forceps or vacuum extraction.¹⁰ The common objective of these other interventions is to facilitate labour with the aim of ensuring a natural delivery with mother and newborn in good health. However, while we might expect to find a trade-off between instrumental delivery and caesarean delivery, a Euro-Peristat analysis using data from 2010 did not find that countries with higher rates of instrumental deliveries had lower caesarean delivery rates.¹⁰

Variations in obstetric intervention rates are affected by the distribution of demographic and clinical characteristics among childbearing women, such as parity, older maternal age, multiple births, fetal presentation, and maternal obesity. They are also related to the health system and specific related factors, such as fear of litigation, financial incentives when payments are higher for caesarean delivery, women’s requests for caesarean delivery, and differences in clinical assessments of risks associated with continued pregnancy for some pregnancy complications.¹¹⁻¹⁴

To monitor practices for all countries, Euro-Peristat collects data not only for all deliveries, but also by subgroups defined by levels of risk. These subgroups make it possible to standardise comparisons between countries and to gain knowledge about practices in specific situations. For instance, it is useful to compare caesarean delivery rates among primiparous women because operative delivery, especially by caesarean section, increases the risk of operative delivery in subsequent pregnancies. Moreover, the complication rates of primiparous women are higher than those of women who have already given birth (see C9 on parity). Furthermore, there are on-going debates about the need for systematic caesarean delivery for breech presentations, multiple births, and women with a previous caesarean birth, and it is useful to highlight differences in practices by comparing rates of caesarean delivery among these subgroups.

Investigation by subgroup also helps to explain variations in the overall caesarean rate. The Robson 10-group classification, which takes these subgroups into consideration, has been recommended by WHO for the evaluation of caesarean rates at the hospital level.^{15,16} The Euro-Peristat project collected data according to the Robson classification for the first time in 2015; these data are in the process of validation and will be published at a later date.

DEFINITION AND PRESENTATION OF INDICATOR

This indicator is defined as the percentage distribution of all births, live born and stillborn, by method of delivery for all women and then subdivided by parity, previous caesarean delivery, presentation, and plurality. Data were also requested for caesarean sections as a percentage of births at grouped weeks of gestational age.

METHODOLOGICAL ISSUES IN THE CALCULATION, REPORTING, AND INTERPRETATION OF THE INDICATOR

Countries differ in the ways that they classify caesarean deliveries. Some countries subdivide them according to whether they took place before or during labour. Others use the subdivision into elective caesarean sections, which include all those planned before the onset of labour and thus include a few that take place after labour has started, and emergency or unplanned caesareans. Sometimes, emergency caesarean sections may include those performed before the onset of labour in response to a clinical emergency. Rates in the Czech Republic, Portugal, Spain, and England were reported per woman. This may result in slight underestimates of operative deliveries, as multiple births to one woman are counted only once.

DATA SOURCES AND AVAILABILITY OF INDICATOR

Method of delivery was available everywhere except Greece. Data about whether caesarean sections took place before labour or were elective were not available for Bulgaria, Ireland, Poland, Portugal, or Hungary. In Spain, national data cover all public hospitals but only around 60% of private hospitals. In Portugal, only the total caesarean rate was available from all hospitals. More detailed data were provided from public hospitals and used to describe caesarean rates by subgroup. No data were available on instrumental deliveries in Bulgaria, Poland, or Portugal. In France, we used the 2016 National Perinatal Survey, which includes all births over a one-week period and collects detailed information on caesareans. This data source was used for Euro-Peristat in 2010 and the comparison over periods is based on the survey data. These data are similar to those from hospital discharge data for France as a whole, provided in Appendix B.

RESULTS

As shown in Figure C10.1, caesarean delivery rates varied widely throughout Europe, with a median of 27.0% and an IQR of 21.2% to 32.7%. Rates were 56.9% in Cyprus and above 40% in Bulgaria, Poland, and Romania. The median vaginal instrumental delivery rate was 7.2%, also with wide variation between countries: 15% or more in Spain, and Ireland versus below 3% in Romania, Lithuania, Croatia, Slovakia, Slovenia, Latvia, and the Czech Republic. Data from 2015 showed that, as in 2010, instrumental delivery rates were not correlated with caesarean delivery rates.

Figure C10.2 shows caesareans subdivided into those initiated before labour (or planned) and those during labour (emergency). Prelabour caesarean delivery rates ranged from 3.6% to 40.5%, with a median of 11.3% for all of the countries that can provide this breakdown. For caesareans during labour, these figures are 8.7% to 43.3% with a median of 12.9%. Unfortunately, some



countries with high caesarean rates, including Bulgaria, Hungary, and Poland, are not able to provide this information.

Figure C10.3 maps overall caesarean delivery rates in Europe by dividing countries into six groups. This map shows that these rates are higher in the southeastern countries of Europe, with some exceptions. There is also a cluster of countries with low rates in the Nordic and Baltic regions.

CHANGES FROM 2010 TO 2015

Countries experienced heterogeneous rate changes between 2010 and 2015, as shown in Figure C10.4, which presents the 2010 rates and their differences in 2015. The differences between these two periods do not seem to be related to the rates in 2010, as there were both increases and decreases in countries with high as well as low caesarean rates. Figure C10.5 displays these changes as relative risks and provides information on the confidence intervals around these estimates. Decreases range from 2 to 13% of 2010 rates, with the largest decreases observed for Lithuania, Latvia, Portugal, Estonia, and Italy. Countries with substantial increases include Hungary, Poland, and Romania, where caesarean delivery rates are among the highest in Europe. Caesarean rates also rose in Ireland and Scotland. The pooled measure of change across all the countries in Europe is 1.04 (95% confidence interval: 1.00-1.08), reflecting the larger number of countries with increased rates; however, the heterogeneity in changes is highly significant.

CAESAREAN SECTION BY RISK GROUP

Table 10.1 displays overall caesarean rates by parity (primiparous, multiparous), previous caesarean section (no, yes), multiplicity (singleton, multiple), and presentation (vertex, breech). For each group, the table reports the number of countries that can provide these data as well as their median, IQR, and minimum and maximum rates. The variation in each group is as wide as for the overall caesarean delivery rate. However, some of the countries with the highest caesarean rates, including Hungary, Bulgaria, Poland, and Romania, cannot provide data in these subgroups. For women giving birth for the first time, the median was 27.7% with an IQR of 22.2%-33.1% and a minimum and maximum of 18.3% and 57.1%. For women with a previous caesarean, the median was 73.9% (range: 44.6%-95.3%), with multiple pregnancies, 64.0% (range: 43.5%-98.5%), and with breech presentations, 89.0% (range: 64.3%-100%). In general, countries had similar practice patterns tending towards lower or higher rates across all subgroups.

KEY POINTS

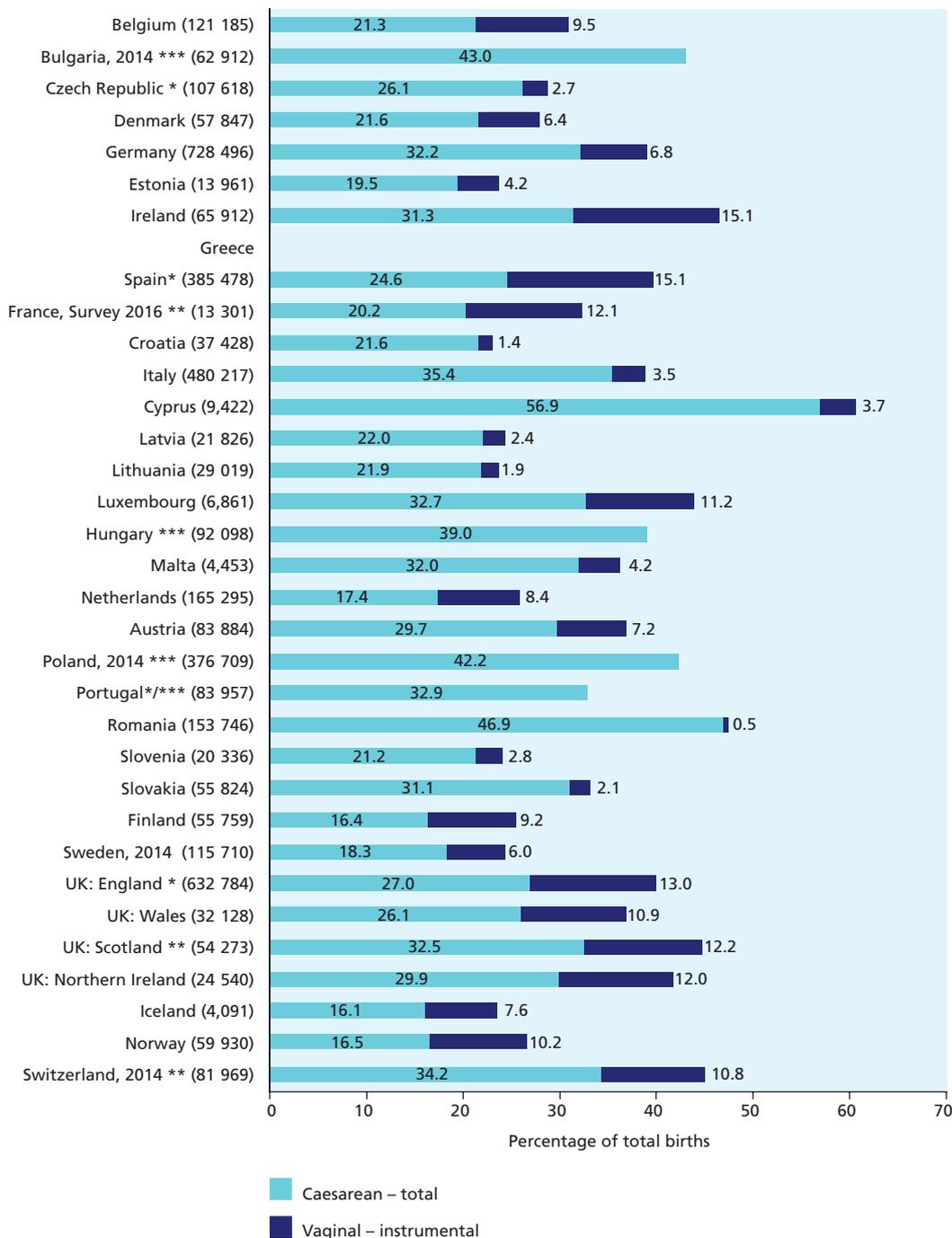
- Mode of delivery differs markedly throughout Europe, with lower levels of caesarean births around 16% to 17% in most Nordic countries and the Netherlands, and higher caesarean rates in Cyprus, Romania, Bulgaria, Poland, and Hungary, around 40% or higher. Other countries with higher than average caesarean rates – around 35% – are Italy and Switzerland.
- Use of instrumental delivery also varies widely and is not related to use of caesarean delivery.
- Marked differences are also observed in key subgroups; in some countries, for example, almost all deliveries for women with a fetus in a breech presentation are by caesarean, whereas elsewhere vaginal delivery is considered in these situations.
- Some countries with high caesarean delivery rates cannot produce data by these subgroups. As this information improves capacity to evaluate care and to compare practices across units and internationally, health information systems in these countries should be broadened to include these items.
- These differences in obstetric interventions across Europe raise questions about their impact on short-term, but also longer-term, maternal and child health. They also underscore the differences in approaches that the countries of Europe have taken to limiting obstetric interventions.



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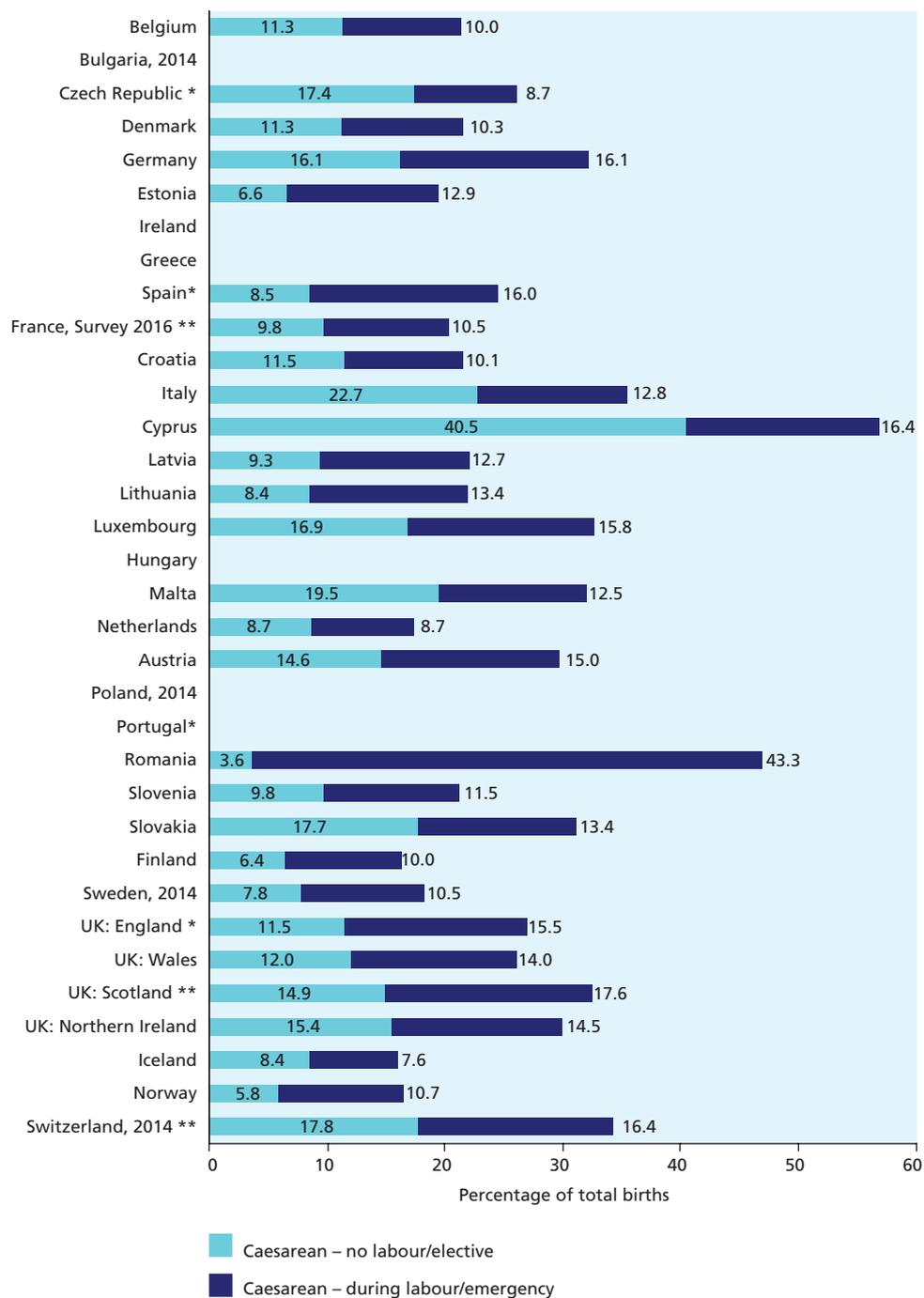
Figure C10.1 Percentages of births by mode of delivery in 2015



Note: *In the Czech Republic, Spain, Portugal, and England, N corresponds to the number of mothers instead of babies.
 ** Missing information: in Switzerland, 185 caesareans with unknown mode of onset are excluded and 3 in France (survey); in Scotland, 181 vaginal deliveries with an unknown mode of delivery (instrumental or not) are excluded.
 *** Bulgaria, Hungary, Portugal, and Poland do not have data on vaginal instrumental deliveries.



Figure C10.2 Percentages of births by type of caesarean delivery in 2015



Note: *In the Czech Republic, Spain, and England, N corresponds to the number of mothers instead of babies. ** Missing information: in Switzerland, 185 caesarean sections with unknown mode of onset are excluded, and 3 in France (survey); in Scotland, 181 vaginal deliveries with unknown mode of delivery (instrumental or not) are excluded.

Figure C10.3 Caesareans as a percentage of all births in 2015

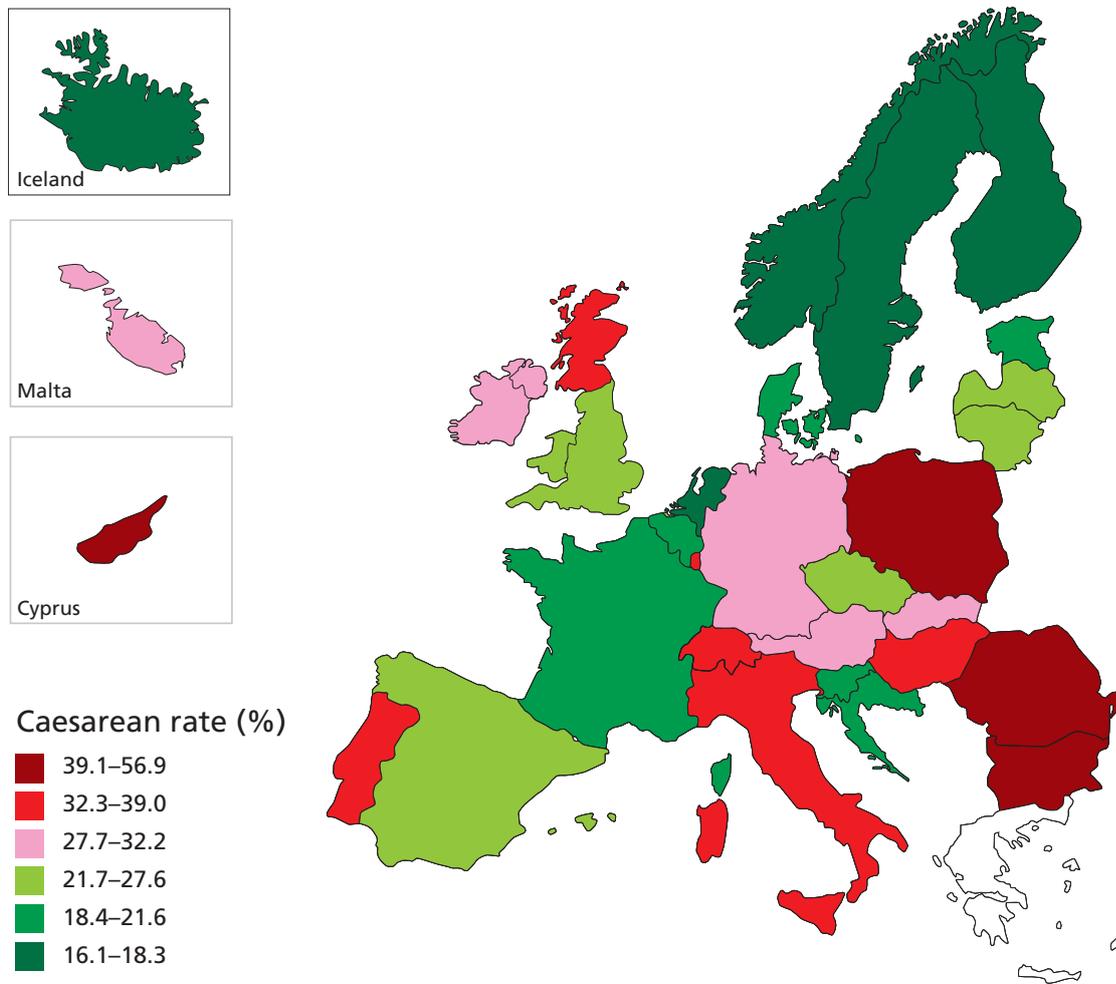
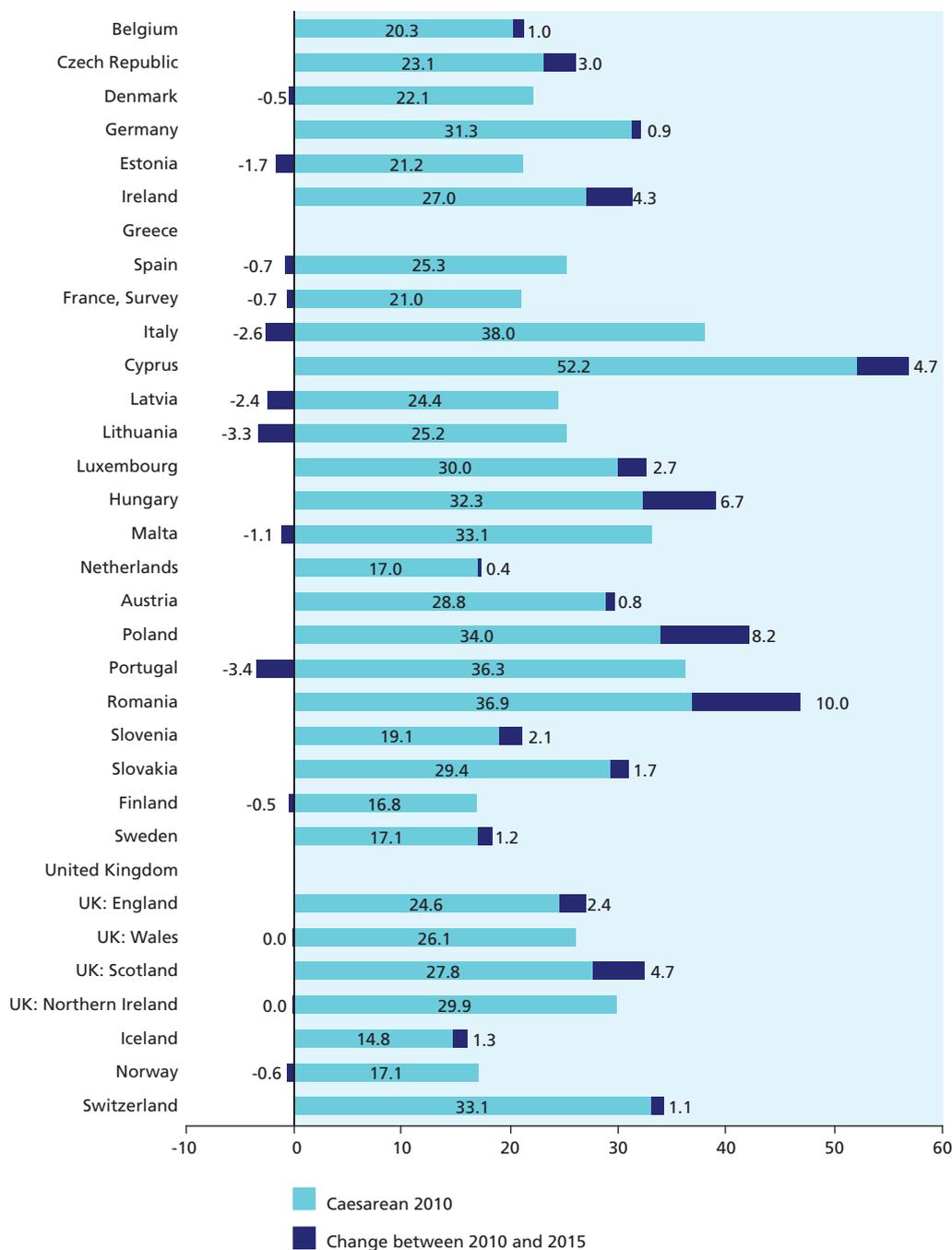


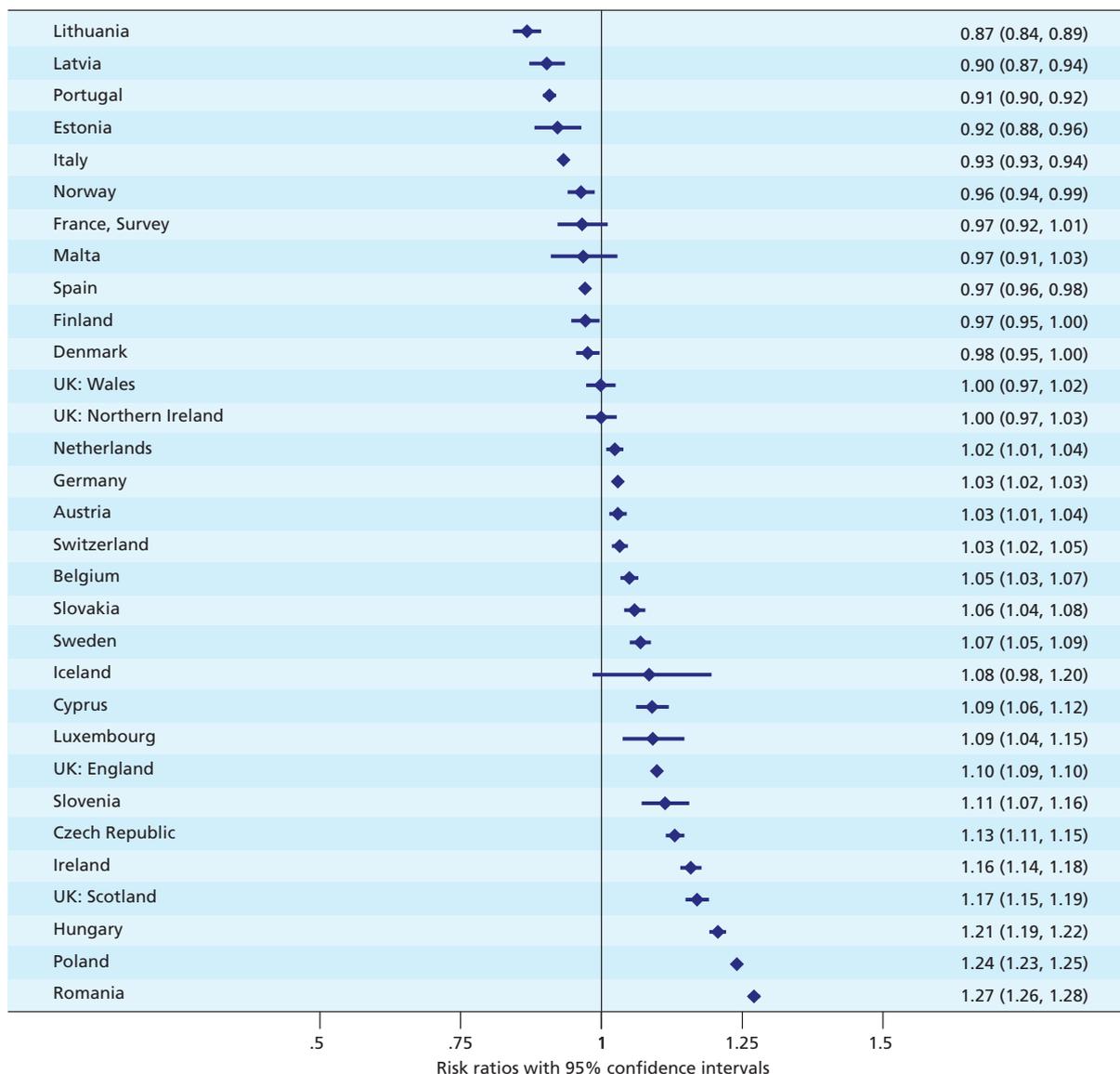


Figure C10.4 Percentages of births by caesarean delivery in 2010 and differences with 2015



NOTE: First-period data not from 2010: Cyprus 2007.
 Second-period data not from 2015: Bulgaria 2014, Poland 2014, Sweden 2014, Switzerland 2014.

Figure C10.5 Comparison of caesarean delivery rates, 2010 and 2015 (risk ratios and 95% confidence intervals)



NOTE: Pooled random effects estimate: 1.04 (95% CI: 1.00-1.08).
 $I^2=99.7\%$ Chi squared tests of heterogeneity: 9483.02 (d.f. = 30), $p < 0.001$.
 First-period data not from 2010: Cyprus 2007.
 Second-period data not from 2015: Bulgaria 2014, Poland 2014, Sweden 2014, Switzerland 2014.



Table C10.1 Caesarean delivery rates by risk subgroup

Country/ coverage	Data Source	Total births*	Percentage of total births							
			Caesarean section rates by subgroup							
			Primiparous	Multiparous	No previous caesarean	Previous caesarean	Singleton pregnancy	Multiple pregnancy	Vertex	Breech
Belgium	1	121 185	22.5	20.5	15.6	68.4	20.0	58.5	17.0	89.7
Bulgaria										
Czech Republic	2	107 618	28.0	24.4	20.6	74.9	25.3	80.4	NA	96.9
Denmark	1	57 847	22.2	21.1	18.9	66.8	20.2	63.1	18.3	88.6
Germany	1	728 496	34.5	30.1	26.5	71.5	30.5	75.2	NA	NA
Estonia	1	13 961	21.3	18.2	14.6	61.7	18.0	62.7	17.0	89.4
Ireland	1	65 912	33.2	30.1	NA	NA	29.9	66.8	NA	NA
Greece										
Spain	1	385 478	30.4	22.7	NA	NA	24.8	67.8	NA	NA
France, Survey 2016	1	13 301	23.2	18.0	15.3	59.1	19.0	54.3	16.9	74.8
Croatia	1	37 428	24.5	18.7	17.0	68.5	20.3	59.0	NA	NA
Italy	9	480 217	35.5	35.4	26.1	88.6	33.7	87.5	32.2	96.3
Cyprus	1	9422	57.1	56.6	45.7	95.3	54.8	93.2	54.8	96.2
Latvia	1	21 826	22.2	21.9	14.4	87.7	20.9	58.0	19.6	73.2
Lithuania	1.2	29 019	22.5	21.2	15.5	76.4	20.8	57.4	19.7	84.5
Luxembourg	1	6861	35.1	30.4	5.4	78.0	30.8	82.7	28.2	96.0
Hungary										
Malta	1	4453	30.9	33.2	23.7	78.1	29.9	98.5	29.3	98.2
Netherlands	1	165 295	19.2	16.0	13.5	61.9	16.6	43.5	14.2	78.8
Austria	1	83 884	31.2	28.3	NA	NA	28.1	79.8	25.8	93.6
Poland										
Portugal**	2	86 048	NA	NA	22.1	68.4	26.9	64.0	23.8	93.0
Romania										
Slovenia	1	20 336	22.8	19.7	16.7	78.7	19.6	60.7	17.6	86.9
Slovakia	1	55 824	32.9	29.1	22.6	80.8	29.8	78.5	NA	NA
Finland	1	55 759	20.8	13.2	12.9	44.6	15.4	49.5	14.0	64.3
Sweden 2014	1	115 710	20.4	16.7	10.2	69.3	17.1	59.0	15.4	88.6
United Kingdom										
UK: England	2	632 784	28.1	26.6	24.2	72.8	26.4	69.4	23.5	88.0
UK: Wales	1	32 128	27.4	25.5	21.2	77.4	25.0	63.1	23.8	87.5
UK: Scotland	1	54 273	33.3	31.9	25.0	83.9	31.2	77.4	24.3	100.0
UK: Northern Ireland	1	24 540	30.3	29.6	19.6	78.4	28.6	70.6	26.2	89.6
Iceland	1	4091	18.3	15.8	10.6	65.0	15.8	44.2	13.8	86.2
Norway	1	59 930	18.6	14.9	12.6	52.4	15.5	46.4	13.7	65.5
Switzerland 2014	1,2,3	81 969	35.6	33.0	28.3	88.2	32.4	81.1	28.5	95.5
N or countries			28	28	26	26	29	29	23	24
Median			27.7	23.6	19.3	73.9	25.0	64.0	19.7	89.0
[IQR]			[22.2-33.1]	[18.5-30.1]	[14.6-24.2]	[66.8-78.7]	[19.6-29.9]	[58.5-78.5]	[16.9-26.2]	[85.4-95.8]
Min/Max			18.3/57.1	13.2/56.6	10.2/45.7	44.6/95.3	15.4/54.8	43.5/98.5	13.7/54.8	64.3/100

Note: *Number of total births with at least some data on mode of delivery, but denominators change for each subgroup.

** Data from public hospitals only.

