

# Trends in caesarean section rates in Europe from 2015-2019 using Robson's Ten-Group Classification System: A Euro-Peristat registry study

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# Objectives of the study

- To assess changes in caesarean section (CS) in Europe from 2015 to 2019
- Use the Robson Ten Group Classification System (TGCS) to evaluate the contribution of different obstetric populations to overall CS rates and trends

# Methods - data

- This was an observational study utilising routine population birth data from countries participating in the Euro-Peristat network.
- We included all births  $\geq 22$  weeks gestational age, from 2015 to 2019.

# The Euro-Peristat Project



- Aim : to monitor perinatal health in the EU based on valid and reliable routinely collected indicators
- Scope : Maternal, fetal and infant health associated with pregnancy, delivery and the postpartum period



Co-funded by  
the Health Programme  
of the European Union



# Key principles

- Population-based routine data sources (vital statistics, birth registers, hospital data)
- Valid and comparable indicators
- Feasible (data available, limited number)
- Broad geographic coverage (inclusiveness, equity, diversity)
- Network of specialists to analyse data, participation from all countries (31 European countries)

# Federated analytic system (for data collection 2015-2019)






## Implementation of PHIRI protocol






- Implemented successfully protocol
- Not yet implemented protocol



- 1 Specifications for common data model (CMD) and R scripts sent to the data hub
- 2 Country used individual-level data from routine sources and create common data model according to specifications and runs the R scripts on their own server
- 3 Anonymous data tables are sent back to the central hub for analysis (*with aggregate data tables on yearly CS rates and the Robson TGCS classification*)

# Analysis: Robson's Ten Group Classification System (TGCS)

	<b>Group 1</b>	<b>Nulliparous</b> Women with a single cephalic pregnancy, $\geq 37$ weeks gestation in spontaneous labour
	<b>Group 2</b>	<b>Nulliparous</b> women with a single cephalic pregnancy, $\geq 37$ weeks gestation who either had labour induced or were delivered by caesarean section before labour
	<b>Group 3</b>	<b>Multiparous women without a previous CS</b> , with a single cephalic pregnancy, $> 37$ weeks gestation in spontaneous labour
	<b>Group 4</b>	<b>Multiparous women without a previous CS</b> , with a single cephalic pregnancy, $> 37$ weeks gestation who either had labour induced or were delivered by caesarean section before labour
	<b>Group 5</b>	All multiparous women with <b>at least one previous CS</b> , with a single cephalic pregnancy, $> 37$ weeks gestation

	<b>Group 6</b>	All <b>nulliparous</b> women with a single <b>breech</b>
	<b>Group 7</b>	All <b>multiparous</b> women with a single <b>breech</b> , including women with previous CS
	<b>Group 8</b>	All women with <b>multiple pregnancies</b> , including women with previous CS
	<b>Group 9</b>	All women with a single pregnancy with a <b>transverse or oblique lie</b> , including women with previous CS
	<b>Group 10</b>	All women with a single cephalic pregnancy <b><math>&lt; 37</math> weeks gestation</b> , including women with previous CS

# Methods-analysis

Based on the Robson TGCS, we computed:

1. Relative size of each group
2. Caesarean section rate for each group
3. Relative and absolute contribution to the overall CS rate



# Investigation using risk groups: the Robson classification

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[www.bjog.org](http://www.bjog.org)

Original Article  
Epidemiology

## Using Robson's Ten-Group Classification System for comparing caesarean section rates in Europe: an analysis of routine data from the Euro-Peristat study

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# Results - availability of Robson TGCS group

- 28 countries participated in the data collection exercise
  - 3 countries provided only aggregate data on caesarean
  - 6 countries could include caesarean in the common data model, but did not have the clinical groups for the Robson TGCS
- 19 countries could provide the Robson TGCS
  - Including 2 countries with data now, but not in 2015-2016

# Results

- Among 28 European countries, CS rates varied from 16.0 to 52.2% in 2019
- Trends from 2015 to 2019: -3.7 to +4.7% with 9 countries decreasing, 7 stable, 12 increasing
- 17 countries with the Robson TGCS were more likely to have decreases
  - *-0.2 mean absolute change versus +1.1 for countries*

# Results

- In 17 countries with the Robson TGCS, labour induction increased (Groups 2a, 4a), while multiple pregnancies (Group 8) decreased.

# Absolute change in percentage points in relative size (% of the total population) of Robson TGCS groups, 2015-2019

COUNTRY	CS Rate (%) 2015, 2019	CS rate Change	ROBSON GROUPS														
			1	2	2a	2b	3	4	4a	4b	5	6	7	8	9	10	X
Cyprus	55.9, 52.2	(-3.7)	-2.1	1.0	3.1	-2.0	-1.3	2.9	3.8	-0.9	1.4	0.0	0.1	-0.3	0.0	-0.4	-1.3
Italy	35.8, 33.4	(-2.4)	-2.0	0.5	2.2	-1.6	0.4	1.1	1.4	-0.3	0.6	0.0	0.0	-0.1	0.0	-0.1	-0.4
Luxembourg	31.8, 29.5	(-2.3)	0.4	-0.7	-0.5	-0.2	1.1	-1.1	-0.8	-0.3	0.8	0.1	-0.5	0.1	0.0	-0.3	0.1
Denmark (2015, 2018)	20.8, 19.6	(-1.2)	0.0	1.0	1.1	-0.1	-0.3	0.0	0.2	-0.2	-0.5	0.1	-0.2	-0.2	0.0	0.1	0.0
Czech Republic (2016, 2019)	24.4, 23.8	(-0.6)	-0.8	0.6	0.5	0.1	1.0	0.4	0.5	-0.1	0.7	-0.6	-0.4	-0.1	-0.3	-0.3	-0.1
Germany	32.3, 31.8	(-0.5)	-1.8	-0.7	-0.2	-0.4	0.9	0.0	0.3	-0.3	1.9	-0.1	0.0	0.0	0.0	-0.3	0.0
Iceland	16.3, 16.2	(-0.1)	1.8	1.7	1.5	0.2	-2.5	-0.6	-0.3	-0.3	-0.7	-0.2	0.2	-0.2	-0.1	0.6	---
Malta	31.0, 30.9	(-0.1)	1.7	0.3	1.0	-0.7	0.2	-0.4	-0.3	0.0	-2.5	0.2	0.4	0.2	-0.1	-0.3	0.3
Norway	16.1, 16.0	(-0.1)	-2.5	2.3	2.3	0.1	-1.8	2.0	2.1	-0.1	0.0	0.1	0.1	-0.2	0.1	-0.1	---
Estonia	18.8, 18.8	(0.0)	-6.1	1.5	1.8	-0.3	-1.5	3.4	3.5	-0.1	0.8	0.3	0.4	-0.1	1.6	-0.4	0.0
Belgium	20.8, 20.9	(+0.1)	0.2	0.6	0.7	-0.1	0.3	0.4	0.2	0.2	-0.2	0.0	-0.1	-0.2	-0.8	0.2	-0.3
Sweden	17.4, 17.7	(+0.3)	-2.3	1.9	1.9	0.0	-1.8	1.8	1.9	-0.1	0.7	-0.1	-0.1	-0.1	---	-0.1	0.1
Latvia	21.5, 22.0	(+0.5)	-5.0	2.1	2.3	-0.2	0.1	2.8	2.7	0.1	0.4	-0.1	0.0	-0.2	0.0	-0.1	---
Slovenia	20.4, 21.3	(+0.8)	-3.5	2.0	2.1	-0.1	-1.2	2.5	2.5	-0.1	0.9	-0.3	-0.2	-0.1	0.1	-0.2	---
Finland	16.0, 17.5	(+1.5)	-1.2	4.1	3.4	0.7	-3.0	4.1	3.8	0.3	0.2	-0.8	-0.6	-0.1	-2.9	0.1	0.1
UK: Northern Ireland	29.5, 32.2	(+2.6)	-0.8	1.7	1.2	0.5	-2.0	2.2	1.6	0.6	0.0	0.1	-0.2	0.0	-0.5	0.3	-0.7
UK: Scotland (2016, 2019)	32.0, 34.9	(+2.8)	0.6	1.9	1.7	0.2	-0.3	2.1	1.8	0.2	1.9	0.4	0.4	0.0	-1.8	0.6	-5.7

Trend	Change from 2015-2109
Increasing	≥5.0%
	1.0-4.9%
	<1.0%
Decreasing	<-1.0%
	-1.0-4.9%
	≥-5.0%

# Results

- In 17 countries with the Robson TGCS, labour induction increased (Groups 2a, 4a), while multiple pregnancies (Group 8) decreased.
- In countries with decreasing overall CS rates, CS tended to decrease in most Robson groups, while in countries with increasing overall CS rates, CS tended to increase in most Robson groups.

# Absolute change in percentage points in CS rate (%) of Robson TGCS groups, 2015 to 2019

COUNTRY	CS Rate (%) 2015, 2019	CS rate Change	ROBSON GROUPS														
			1	2	2a	2b	3	4	4a	4b	5	6	7	8	9	10	X
Cyprus	55.9, 52.2	(-3.7)	1.1	-12.5	-10.9	0.0	1.7	-16.5	-2.7	0.0	-3.3	-3.5	1.3	0.3	0.8	-3.4	-23.6
Italy	35.8, 33.4	(-2.4)	-0.6	-7.9	0.6	0.0	-0.4	-7.1	0.0	0.0	-0.7	0.8	-0.1	0.1	1.3	-0.6	-27.1
Luxembourg	31.8, 29.5	(-2.3)	-1.8	-4.8	-5.3	0.0	-0.8	-2.2	-0.7	0.0	-3.3	0.8	-3.3	-0.6	3.3	-1.2	-52.4
Denmark (2015, 2018)	20.8, 19.6	(-1.2)	-0.6	-2.2	-0.4	0.0	-0.4	-3.4	-1.5	0.0	-2.3	-4.0	0.3	-3.0	3.5	2.5	1.0
Czech Republic (2016, 2019)	24.4, 23.8	(-0.6)	0.5	0.1	1.9	0.0	0.1	-3.7	-0.2	0.0	-1.1	-1.1	-2.0	0.9	0.0	2.1	4.6
Germany	32.3, 31.8	(-0.5)	-0.5	-1.9	-0.5	0.0	-0.9	-3.4	-0.7	0.0	0.3	-0.8	-0.9	-1.3	0.0	-0.8	-4.2
Iceland	16.3, 16.2	(-0.1)	0.1	-3.5	-4.6	0.0	0.1	-0.3	2.0	0.0	5.3	-4.2	-12.7	-0.2	0.0	-4.0	--
Malta	31.0, 30.9	(-0.1)	2.8	-3.1	-0.3	0.0	-0.4	1.2	1.3	0.0	8.9	-0.9	2.5	-5.2	-5.3	-3.2	--
Norway	16.1, 16.0	(-0.1)	-1.0	-1.1	-0.7	0.0	-0.1	-3.0	-0.6	0.0	-0.3	2.7	-0.3	-2.1	-1.9	-2.4	--
Estonia	18.8, 18.8	(0.0)	-0.2	-4.6	-1.1	0.0	-0.3	-6.8	-3.3	0.0	-6.3	1.2	-3.5	-8.1	-12.9	-2.9	--
Belgium	20.8, 20.9	(+0.1)	0.4	-0.6	0.4	0.0	0.1	1.8	0.4	0.0	-1.5	-0.1	-1.4	-1.6	21.1	-0.6	33.8
Sweden	17.4, 17.7	(+0.3)	0.0	-3.2	-1.7	0.0	0.0	-4.4	-0.8	0.0	1.0	-0.8	1.7	-0.2	--	2.4	1.0
Latvia	21.5, 22.0	(+0.5)	1.6	-2.6	2.3	0.0	0.3	-1.1	1.3	0.0	-5.0	7.6	1.8	-0.9	-0.8	3.0	--
Slovenia	20.4, 21.3	(+0.8)	1.1	-2.1	-0.2	0.0	0.0	-4.0	0.4	0.0	0.3	3.2	-0.2	0.9	0.0	1.5	--
Finland	16.0, 17.5	(+1.5)	1.1	4.8	2.8	0.0	0.6	1.1	1.0	0.0	6.1	-6.7	-6.9	-0.6	26.2	4.0	1.7
UK: Northern Ireland	29.5, 32.2	(+2.6)	1.8	5.4	4.3	0.0	0.8	4.3	2.9	0.0	1.5	-1.8	-0.5	-3.9	-1.9	3.1	--
UK: Scotland (2016, 2019)	32.0, 34.9	(+2.8)	1.3	1.9	2.1	0.0	0.3	0.5	0.1	0.0	2.8	1.2	1.6	0.9	26.1	1.5	14.2

# Results

- In 17 countries with the TGCS, labour induction increased (Groups 2a, 4a), while multiple pregnancies (Group 8) decreased.
- In countries with decreasing overall CS rates, CS tended to decrease in most Robson groups, while in countries with increasing overall CS rates, CS tended to increase in most Robson groups.
- In countries with the greatest increase in CS rates (>1%), absolute contributions of Groups 1 (nulliparous term cephalic singletons, spontaneous labour), 2a and 4a, 2b and 4b (prelabour CS), and 10 (preterm cephalic singletons) to overall CS tended to increase.



# Absolute change in contribution to overall CS rate (%) of Robson TGCS groups, 2015 to 2019

COUNTRY	CS Rate (%) 2015, 2019**	CS rate Change	ROBSON GROUPS														
			1	2	2a	2b	3	4	4a	4b	5	6	7	8	9	10	X
Cyprus	55.9, 52.2	(-3.7)	-0.3	-2.1	0.0	-2.0	0.2	-0.7	0.2	-0.9	0.7	-0.1	0.2	-0.3	0.0	-0.5	-0.7
Italy	35.8, 33.4	(-2.4)	-0.4	-1.0	0.6	-1.6	-0.1	-0.2	0.1	-0.3	0.5	0.0	0.0	-0.1	0.0	-0.1	-1.0
Luxembourg	31.8, 29.5	(-2.3)	-0.4	-1.0	-0.8	-0.2	-0.1	-0.4	-0.1	-0.3	0.2	0.1	-0.6	0.1	0.0	-0.2	0.0
Denmark* (2015, 2018)	20.8, 19.6	(-1.2)	-0.2	0.1	0.2	-0.1	-0.1	-0.3	-0.1	-0.2	-0.5	0.0	-0.1	-0.1	0.0	0.1	0.0
Czech Republic* (2016, 2019)	24.4, 23.8	(-0.6)	0.1	0.3	0.2	0.1	0.0	-0.1	0.0	-0.1	0.4	-0.6	-0.4	-0.1	-0.3	0.0	0.1
Germany	32.3, 31.8	(-0.5)	-0.5	-0.5	-0.1	-0.4	-0.2	-0.3	0.0	-0.3	1.3	-0.1	0.0	0.0	0.0	-0.2	0.0
Iceland	16.3, 16.2	(-0.1)	0.2	0.0	-0.2	0.2	0.0	-0.1	0.2	-0.3	0.1	-0.2	0.1	-0.1	-0.1	0.0	---
Malta	31.0, 30.9	(-0.1)	1.0	-0.5	0.2	-0.7	-0.1	0.1	0.1	0.0	-0.9	0.1	0.4	0.1	-0.1	-0.3	0.1
Norway	16.1, 16.0	(-0.1)	-0.5	0.5	0.4	0.1	-0.1	0.0	0.1	-0.1	0.0	0.1	0.0	-0.1	0.0	-0.1	---
Estonia	18.8, 18.8	(0.0)	-0.8	0.1	0.4	-0.3	-0.2	-0.1	0.0	-0.1	-0.1	0.3	0.3	-0.2	0.9	-0.2	---
Belgium	20.8, 20.9	(+0.1)	0.1	0.1	0.2	-0.1	0.0	0.3	0.1	0.2	-0.3	0.0	-0.1	-0.2	0.3	0.0	-0.1
Sweden	17.4, 17.7	(+0.3)	-0.2	0.3	0.2	0.0	0.0	-0.1	0.0	-0.1	0.4	-0.1	0.0	-0.1	0.0	0.1	0.1
Latvia	21.5, 22.0	(+0.5)	-0.2	0.5	0.7	-0.2	0.1	0.3	0.2	0.1	-0.2	0.0	0.0	-0.1	---	0.1	---
Slovenia	20.4, 21.3	(+0.8)	-0.1	0.4	0.5	-0.1	0.0	0.1	0.1	-0.1	0.7	-0.2	-0.2	-0.1	0.1	0.0	---
Finland	16.0, 17.5	(+1.5)	0.1	1.8	1.1	0.7	0.1	0.5	0.2	0.3	0.7	-0.7	-0.5	0.0	-0.7	0.2	0.0
UK: Northern Ireland	29.5, 32.2	(+2.6)	0.1	1.4	0.9	0.5	0.1	1.3	0.7	0.6	0.2	0.0	-0.2	-0.1	-0.4	0.3	-0.3
UK: Scotland* (2016, 2019)	32.0, 34.9	(+2.8)	0.3	1.0	0.8	0.2	0.0	0.4	0.2	0.2	1.8	0.4	0.4	0.0	-0.6	0.3	-1.1

# Conclusions


- Analysis of the Robson TGCS shows varying CS trends and rates across Europe.
  - Comparisons between European countries, particularly those with divergent trends, could provide insight into strategies to reduce CS without indication
- Need to improve data, only 19 out of 28 countries could provide this classification

# For more information



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## **Trends in caesarean section rates in Europe from 2015 to 2019 using Robson's Ten Group Classification System: A Euro-Peristat study**

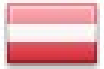
Melissa Amyx, Marianne Philibert, Alex Farr, Serena Donati, Alexander K. Smáráson, Vlad Tica, Petr Velebil, Sophie Alexander, Mélanie Durox, Maria Fernandez Elorriaga, Günther Heller, Theopisti Kyprianou, Ewa Mierzejewska, Ivan Verdenik, Irista Zile-Velika, Jennifer Zeitlin , for the Euro-Peristat Research Group ... [See fewer authors](#) ^

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# Euro-Peristat Network

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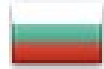
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Belgium



Bulgaria



Croatia



Cyprus



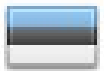
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Denmark



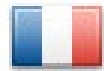
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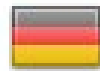
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France



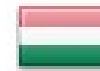
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Greece



Hungary



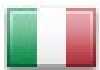
Iceland



Ireland



Italy



Latvia



Lithuania



Luxembourg



Malta



Netherlands



Norway



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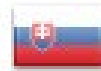
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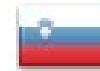
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Slovenia



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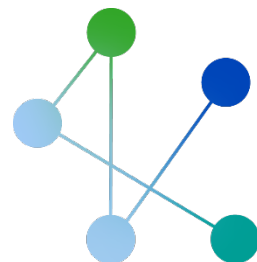
Sweden



Switzerland



UK



## PHIRI

Population Health Information  
Research Infrastructure



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