

RISK OF CESAREAN AFTER INDUCTION OF LABOR: IMPACT OF DEFINITION OF EXPECTANT MANAGEMENT COMPARATOR GROUP

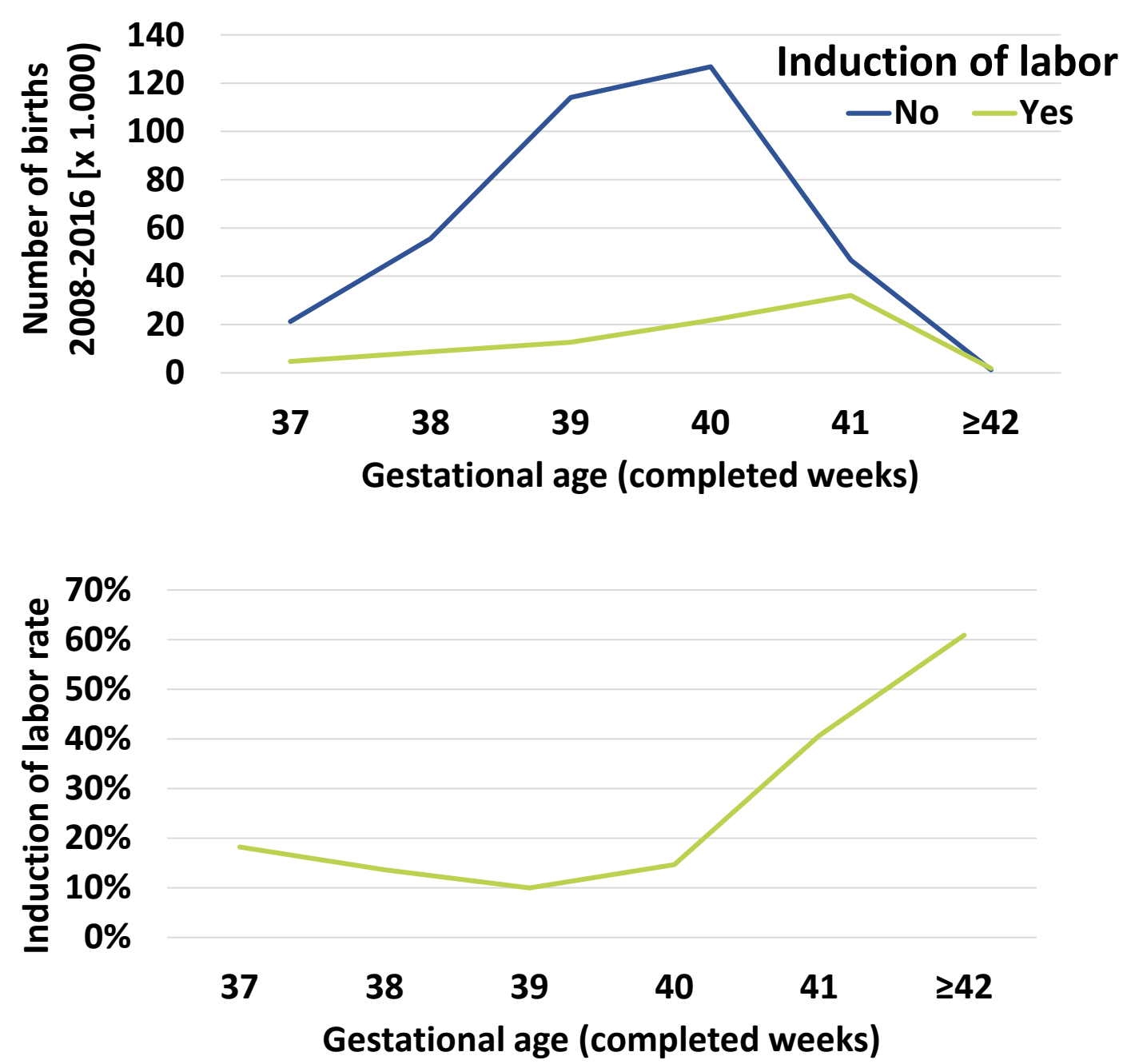


Christoph Zenzmaier¹, Bernhard Pfeifer², Hermann Leitner², Martina König-Bachmann¹

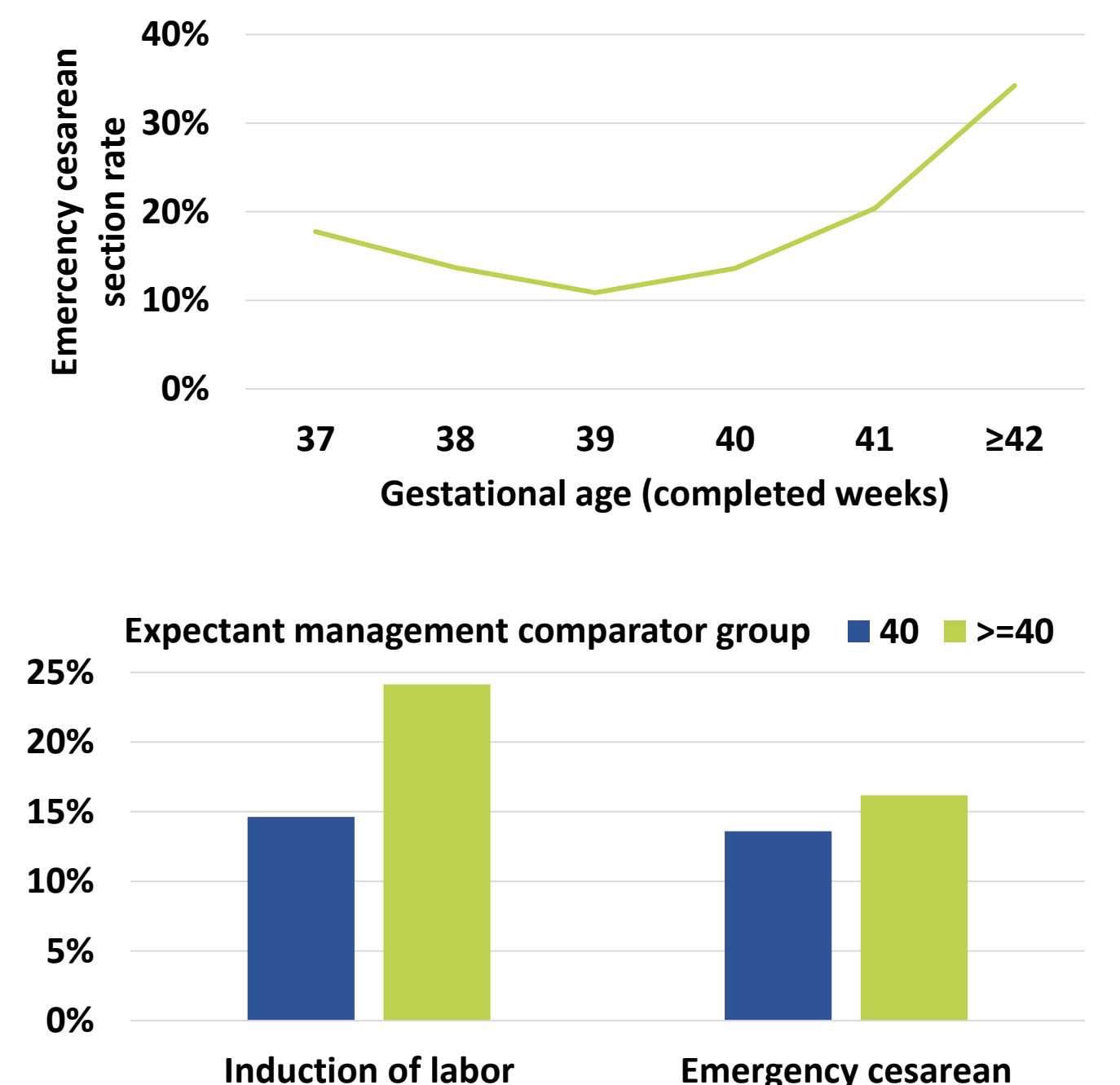
¹University of Applied Sciences Tyrol, Innsbruck, Austria

²Institute of Clinical Epidemiology, Tyrolean State Hospitals Ltd, Innsbruck, Austria

Background



- When compared with spontaneous labor, induction of labor (IOL) is associated with higher cesarean section (CS) rates.
- Most observational studies that used expectant management (EM) as comparator, which better reflects clinical management, found no increased risk of CS after IOL.
- In the majority of studies, EM includes all births at a later gestation. However, given the increasing CS and IOL rates observed after 39 completed weeks, this definition of EM might add a bias in favor of early IOL.



Characteristics of the study population

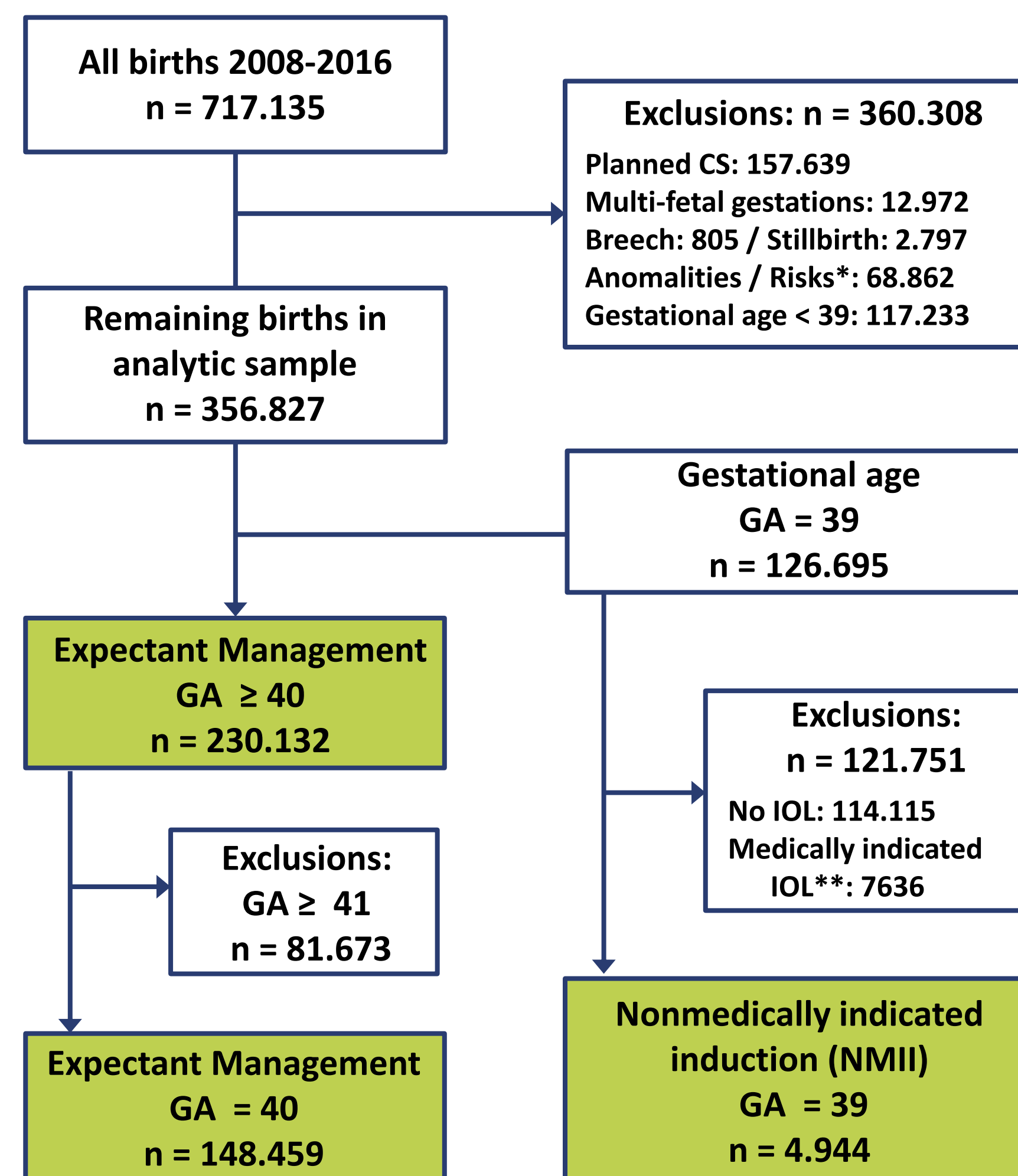
Data for this retrospective cohort study were retrieved from the Austrian Perinatal Registry and included all hospitals births with gestational ages beyond 39 completed weeks in Austria from 2008-2016.

Sample flow and comparison groups are shown in the illustration at the right.

*Anomalities / Risks excluded: previous CS or other uterine surgery, diabetes, hypertension, bleeding and thrombotic disorders, placenta previa and fetal abnormalities.

**Indications excluded from the NMII group but retained in EM: PROM, placental insufficiency, premature separation of placenta, poly-/oligohydramnios, fetal distress, preeclampsia, eclampsia, HELLP, antepartum bleeding, amniotic infection and proteinuria.

Characteristics of the comparison groups are given in the table at the right end.



Characteristics	NMII 39 n = 4944	Expectant ≥ 40 n = 230.132	Expectant = 40 n = 148.459	p-value	
Maternal age	<20	2,4%	2,3%	2,3%	<0.001
	20-24	14,9%	15,4%	15,1%	
	25-29	28,0%	31,0%	31,0%	
	30-34	30,7%	31,8%	32,1%	
	35-39	18,1%	15,9%	15,9%	
	≥40	5,9%	3,6%	3,6%	
Parity	0	46,1%	51,0%	48,7%	<0.001
	1	30,7%	32,7%	34,4%	
	≥2	21,4%	16,1%	16,6%	
	missing	1,9%	0,3%	0,3%	
BMI	<18.5	3,9%	4,1%	4,3%	<0.001
	18.5-24.9	37,9%	46,9%	47,1%	
	25.0-29.9	14,3%	13,8%	13,3%	
	30.0-34.9	5,9%	4,7%	4,4%	
	35.0-39.9	2,2%	1,4%	1,3%	
	≥40.0	0,9%	0,5%	0,5%	
Labor duration	<12h	79,4%	79,4%	81,0%	<0.001
	12-24h	4,9%	8,1%	7,9%	
	>24h	1,2%	0,8%	0,7%	
	missing	14,5%	11,7%	10,4%	
Birth weight	1500-2499g	3,3%	0,3%	0,4%	<0.001
	2500-3999g	85,1%	85,2%	87,3%	
	4000-6000g	11,5%	14,3%	12,1%	
	missing	0,1%	0,1%	0,1%	
Hospital level	Level 1	48,4%	41,6%	42,0%	<0.001
	Level 2	17,9%	25,8%	25,7%	
	Level 3	10,4%	11,1%	11,0%	
	Level 4	23,4%	21,4%	21,3%	

Results

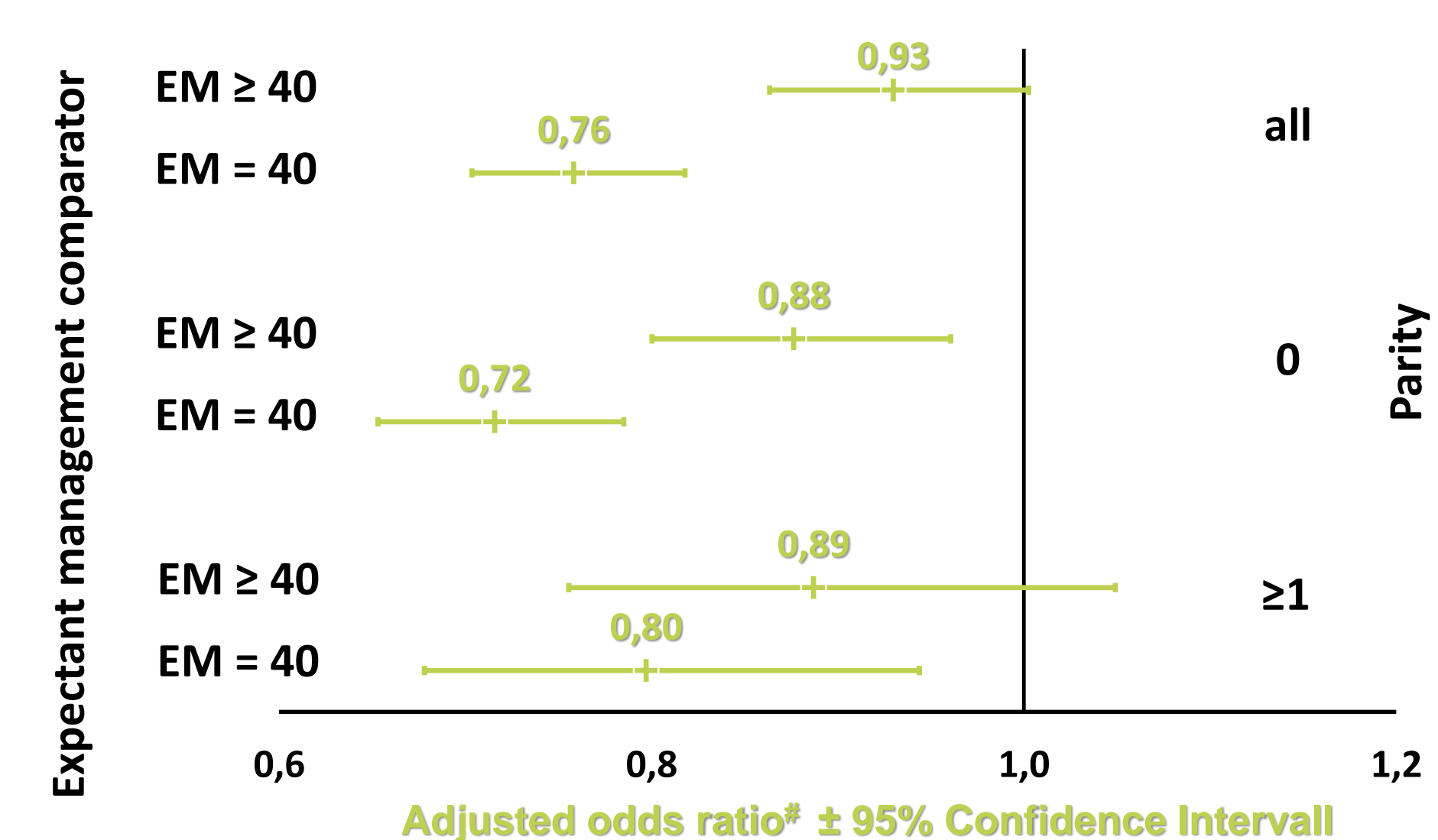
Emergency cesarean section rates in the comparison groups

Study Group	NMII 39	EM ≥ 40	p-value*	EM = 40	p-value*	
Emergency CS rate	Parity					
	all	17.2%	16.2%	0.058	13.6%	<0.001
	0	29.1%	26.5%	0.005	22.7%	<0.001
≥1	6.1%	5.5%	0.159	4.9%	<0.001	

*Fisher's exact test

- NMII at GA 39 was not associated with an increased risk of CS compared with EM ≥40.
- EM, when limited to 40 weeks of gestation was associated with significantly reduced odds for CS.
- This difference was similar in a subgroup with parity ≥1, whereas in nullipara NMII increased CS risks compared with both EM definitions.

#Odds ratio was adjusted for parity, BMI, duration of labor, birth weight, birth year and hospital level.



Discussion

Our findings demonstrate that the definition of the EM comparator group has a significant impact when analyzing the outcome of IOL in retrospective cohort studies. Considering NMII usually means to decide between prompt IOL or EM for a few days and then considering NMII again. Thus, to limit the EM group to a gestational age of one week beyond IOL could be useful for clinical decision-making, as it allows to better estimate the risks of EM to the next appointment compared with immediate NMII.