Supplementary material

eTable 1 Unadjusted HR for admission and IRR for LOS in children <1 year and 1-4 years of age

Risk factor		<1 year				1-4 years			
		CA		No anomaly		CA		No anomaly	
		HR for admission	IRR for LOS	HR for admission	IRR for LOS	HR for admission	IRR for LOS	HR for admission	IRR for LOS
Birth cohort	1995-2004	1.15 (1.04-1.27)	1.39 (1.32-1.47)	0.88 (0.81-0.94)	1.16 (0.94-1.43)	1.12 (0.78-1.61)	3.48 (0.57-21.39)	1.00 (0.76-1.32)	1.25 (1.22-1.29)
	2005-2009	Reference				Reference			
	2010-2014	1.04 (0.97-1.12)	0.93 (0.86-1.01)	1.11 (0.98-1.26)	1.04 (0.92-1.18)	0.93 (0.83-1.04)	1.27 (1.00-1.61)	0.82 (0.75-0.90)	1.55 (1.27-1.91)
Sex	Male	Reference				Reference			
	Female	0.94 (0.86-1.03)	1.07 (0.95-1.20)	0.86 (0.78-0.94)	0.88 (0.83-0.94)	0.76 (0.71-0.82)	0.92 (0.38-2.21)	0.76 (0.74-0.78)	0.93 (0.83-1.04)
Maternal age (years)	<20	1.10 (1.04-1.17)	1.18 (0.82-1.70)	1.20 (1.13-1.28)	1.29 (1.24-1.35)	1.10 (1.02-1.20)	0.89 (0.29-2.76)	1.14 (0.99-1.31)	1.42 (1.07-1.87)
	20-34	Reference				Reference			
	35+	1.02 (0.98-1.07)	1.04 (0.93-1.16)	1.02 (1.00-1.03)	1.11 (1.05-1.16)	1.03 (1.00-1.06)	0.55 (0.22-1.36)	0.91 (0.89-0.92)	1.25 (1.01-1.55)
Gestational age	<32	2.21 (1.24-	8.43 (6.50-	6.78 (2.91-15.75)	51.72 (22.87-	1.74 (1.57-1.93)	1.52 (0.73-3.16)	1.93 (1.49-2.49)	2.98 (1.05-8.46)

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(weeks)		3.95)	10.92)		116.95)				
	32-36	1.83 (1.17-2.86)	3.16 (2.55-3.91)	4.03 (2.76-5.89)	8.63 (5.19-14.33)	1.32 (1.21-1.44)	0.97 (0.43-2.17)	1.22 (1.12-1.32)	1.26 (0.97-1.64)
	37+		Reference				Reference		

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eTable 2 Distribution of risk factors among children with and without anomalies in each registry and for the sample as a whole

		Denmark, Funen (1995-2014)		Finland (1997-2014)		Registry Italy, Emilia Romagna (2008-2014)		Italy, Tuscany (2005-2014)		Total	
		CA (n=2,423)	No anomaly (n=100,748)	CA (n=38,324)	No anomaly (n=911,679)	CA (n=5,381)	No anomaly (n=223,995)	CA (n=4,225)	No anomaly (n=23,503)	CA (n=50,353)	No anomaly (n=1,259,925)
Birth cohort	**1995-2004**	51%	53%	36%	43%	-	-	-	-	30%	36%
	2005-2009	28%	25%	31%	28%	22%	30%	49%	49%	31%	29%
	2010-2014	21%	22%	33%	28%	78%	70%	52%	51%	39%	36%
Sex	**Male**	58%	51%	54%	50%	59%	51%	57%	59%	55%	51%
	Female	41%	49%	46%	50%	40%	49%	38%	41%	44%	50%
	Missing	1%	<1%	(0%)	(0%)	1%	<1%	6%	0%	1%	<1%
Multiple birth	**Singleton**	94%	96%	96%	97%	95%	97%	90%	97%	95%	97%
	Multiple	6%	4%	4%	3%	4%	3%	4%	3%	4%	3%
	Missing	<1%	0%	0%	0%	1%	0%	6%	0%	1%	0%
Maternal age (years)	**<20**	2%	2%	3%	3%	1%	1%	1%	1%	2%	2%
	20-34	80%	83%	77%	79%	62%	66%	59%	64%	74%	77%
	35+	18%	16%	21%	19%	36%	33%	34%	35%	24%	21%
	Missing	<1%	0%	0%	0%	1%	<1%	6%	0%	1%	<1%
Gestational age (weeks)	**<32**	3%	1%	3%	1%	3%	1%	2%	<1%	3%	1%
	32-36	13%	5%	10%	5%	13%	7%	12%	6%	11%	5%
	37+	82%	92%	89%	95%	84%	92%	79%	94%	86%	94%
	Missing	3%	2%	<1%	<1%	1%	<1%	7%	<1%	1%	<1%
Maternal education	**Low**	<1%	<1%	-	-	4%	5%	2%	2%	3%	4%
	Middle	65%	64%	-	-	69%	68%	66%	68%	67%	67%
	High	33%	33%	-	-	26%	27%	22%	27%	26%	28%
	Missing	2%	2%	-	-	1%	<1%	10%	3%	4%	1%

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The proportions are based on registries included in the analysis. Finland has good maternal education data. However, due to a communication error, they were erroneously excluded from the analysis of maternal education hence they are excluded from the proportion of non-missing maternal education data. Proportions are rounded to the nearest whole number to prevent disclosure issues due to small numbers. As a result, totals may sum to more than 100%. Birth cohort was complete for all children as the birth year was required for study inclusion. Although data were often >99.9% complete for EUROCAT core variables, this study used the information recorded in the birth registries as this was available for both children with and without anomalies. Completeness was, therefore, slightly lower.

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eTable 3 I^2 statistic and P-value from meta-analyses to pool the proportion admitted and median length of stay for those with and without anomalies at <1 and 1-4 years

Risk factor		<1 year			
		CA		No anomaly	
		Percent admitted	**Median LOS per year**	**Percent admitted**	**Median LOS per year**
Birth cohort[b]	1995-2004	96.94, <0.001	86.10, 0.007	99.93, <0.001	99.62, <0.001
	2005-2009	99.65, <0.001[a]	87.40, 0.005[b]	99.91, <0.001[c]	99.88, <0.001d
	2010-2014	99.83, <0.001	92.81, <0.001	99.98, <0.001	99.96, <0.001
Sex	Male	99.77, <0.001	96.82, <0.001	0, <0.001	99.80, <0.001
	Female	99.73, <0.001	94.53, <0.001	0, <0.001	99.80, <0.001
Multiple Birth	Singleton	99.87, <0.001	98.19, <0.001	99.99, <0.001	99.95, <0.001
	Multiple birth	93.68, <0.001	29.67, 0.279	99.77, <0.001	99.20, <0.001
Maternal age (years)	<20	88.86, <0.001	0.000, 0.925	99.32, <0.001	95.04, <0.001
	20-34	99.81, <0.001	98.01, <0.001	99.98, <0.001	99.84, <0.001
	35+	99.61, <0.001	67.27, 0.038	99.96, <0.001	99.55, <0.001
Gestational age (weeks)	<32	55.07, 0.083	0.000, 0.231	74.55, 0.008	98.71, <0.001
	32-36	96.32, <0.001	92.59, <0.001	99.86, <0.001	99.87, <0.001
	37+	99.87, <0.001	97.08, <0.001	99.99, <0.001	99.95, <0.001
Maternal education	Low	88.10, <0.001	0.00, 0.900	95.09, <0.001	81.07, 0.001
	Middle	99.48, <0.001	95.44, <0.001	99.87, <0.001	99.73, <0.001
	High	99.30, <0.001	86.82, 0.004	99.85, <0.001	99.48, <0.001
Risk factor		1-4 years			
		CA		No anomaly	
		Percent admitted	**Median LOS per year**	**Percent admitted**	**Median LOS per year**
Birth cohort[b]	1995-2004	0.00, 0.594	98.28, <0.001	99.72, <0.001	0.00, 1.0
	2005-2009	94.81, <0.001[e]	95.70, <0.001[f]	99.92, <0.001[g]	99.92, <0.001h
	2010-2014	89.77, <0.001	97.24, <0.001	99.86, <0.001	99.93, <0.001
Sex	Male	96.57, <0.001	98.05, <0.001	99.96, <0.001	99.95, <0.001
	Female	97.75, <0.001	96.75, <0.001	99.94, <0.001	99.95, <0.001
Multiple Birth	Singleton	98.23, <0.001	97.35, <0.001	99.97, <0.001	99.97, <0.001

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	Multiple birth	89.19, <0.001	75.22, 0.026	99.40, <0.001	99.42, <0.001
Maternal age (years)	<20	78.27, 0.003	0.00, 0.882	98.54, <0.001	99.16, <0.001
	20-34	98.01, <0.001	96.52, <0.001	99.96, <0.001	99.96, <0.001
	35+	91.48, <0.001	80.92, <0.001	99.90, <0.001	99.88, <0.001
Gestational age (weeks)	<32	48.75, 0.119	16.65, 0.199	99.24, <0.001	95.98, <0.001
	32-36	94.70, <0.001	80.25, 0.002	99.74, <0.001	99.66, <0.001
	37+	97.96, <0.001	97.99, <0.001	99.97, <0.001	99.97, <0.001
Maternal education	Low	0.00, 0.958	58.34, 0.100	97.33, <0.001	92.77, <0.001
	Middle	98.37, <0.001	79.68, 0.005	99.93, <0.001	99.89, <0.001
	High	95.80, <0.001	0.00, 0.474	99.80, <0.001	99.72, <0.001

[a] 97.68, <0.001 for Funen and Finland only.
[b] 90.78, 0.001 for Funen and Finland only.
[c] 99.80, <0.001 for Funen and Finland only.
[d] 99.75, <0.001 for Funen and Finland only.
[e] 97.68, <0.001 for Funen and Finland only.
[f] 95.91, 0.001 for Funen and Finland only.
[g] 98.77, <0.001 for Funen and Finland only.
[h] 0.000, 1.0 for Funen and Finland only.

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eTable 4 I^2 statistic and P-value from meta-analyses to pool the HR for risk of admission and IRR for LOS for those with and without anomalies at <1 and 1-4 years

		<1 year			
Risk factor		**CA**		**No anomaly**	
		HR for admission	**IRR for LOS**	**HR for admission**	**IRR for LOS**
Birth cohort	1995-2004	71.54, <0.001	71.54, <0.001	97.36, <0.001	97.36, <0.001
	2005-2009		Reference		
	2010-2014	87.85, <0.001	87.85, <0.001	99.47, <0.001	99.47, <0.001
Sex	Male		Reference		
	Female	96.04, <0.001	96.04, <0.001	99.25, <0.001	99.25, <0.001
Multiple Birth	Singleton		Reference		
	Multiple birth	98.69, <0.001	49.93, 0.112	99.39, <0.001	98.16, <0.001
Maternal age (years)	<20	27.78, 0.245	27.78, 0.245	69.60, <0.001	69.60, <0.001
	20-34		Reference		
	35+	72.51, 0.012	72.51, 0.012	52.50, 0.097	52.50, 0.097
Gestational age (weeks)	<32	99.91, <0.001	99.91, <0.011	99.98, <0.001	99.98, <0.001
	32-36	99.86, <0.001	99.86, <0.001	99.94, <0.001	99.94, <0.001
	37+		Reference		
Maternal education	Low	0.000, 0.813	0.000, 0.667	63.09, 0.067	49.03, 0.141
	Middle	89.20, <0.001	54.89, 0.109	97.85, <0.001	83.52, <0.001
	High		Reference		
		1-4 years			
Risk factor		**CA**		**No anomaly**	
		HR for admission	**IRR for LOS**	**HR for admission**	**IRR for LOS**
Birth cohort	1995-2004	97.27, <0.001	97.27, <0.001	99.71, <0.001	99.71, <0.001
	2005-2009		Reference		
	2010-2014	84.50, <0.001	84.50, <0.001	97.53, <0.001	97.53, <0.001

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Sex	Male		Reference		
	Female	64.38, <0.001	64.38, <0.001	71.31, 0.015	71.31, 0.015
Multiple Birth	Singleton		Reference		
	Multiple birth	25.20, 0.260	97.77, <0.001	69.08, <0.001	89.83, <0.001
Maternal age (years)	<20	0.000, 0.514	0.000, 0.514	92.07, <0.001	92.07, <0.001
	20-34		Reference		
	35+	0.000, <0.001	0.000, <0.001	27.66, <0.001	27.66, <0.001
Gestational age (weeks)	<32	14.36, <0.001	14.36, <0.001	95.27, <0.001	95.27, <0.001
	32-36	65.17, <0.001	65.17, <0.001	90.75, <0.001	90.75, <0.001
	37+		Reference		
Maternal education	Low	9.78, 0.330	90.59, <0.001	71.83, <0.001	93.58, <0.001
	Middle	28.38, 0.294	98.88, <0.001	3.55, 0.355	98.54, <0.001
	High		Reference		

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