



Comparing health outcomes of very preterm babies in Europe results from the MOSAIC study

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Aims of MOSAIC

- To describe the provision of care for mothers of very preterm infants and their babies in selected European regions
- To describe a population of very preterm babies born in these regions during 2003
- To relate outcomes of these babies to organisational characteristics

Assessing health outcomes of very preterm babies

- Terminations of pregnancy
- Fetal deaths
- Mortality after live birth
- Morbidity among survivors to discharge home



Methods

1. Study of all very preterm births (22-31 weeks of gestational age) in a geographically defined area

2. Study of all maternity and neonatal units which care for these births/babies



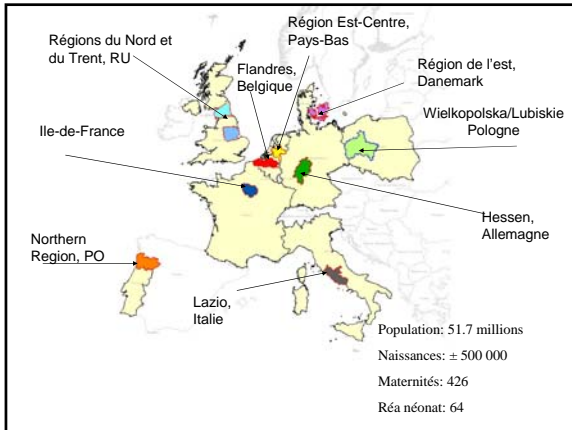
Cohort study

- **Type of study:** prospective study
- **Study population:** births between 22 et 31+6 weeks of amenorrhoea, including terminations of pregnancy and fetal deaths.
- **Follow-up:** until death or discharge from hospital
- **Data** on socio-demographic and clinical characteristics, health care and health outcomes
- **Data collection:** from medical records using common instrument and definitions
- **Completeness:** inclusions cross-checked with birth registries in maternity units and using other data when possible (civil registration)



Unit Study

- All maternity and neonatal units in region
- Postal survey using structured questionnaire
- Data on personnel, equipment, workload, case-mix of units, existence of protocols



MOSAIC regions

Country, region	Total births (1000)	Neonatal mortality national data (2003)	Infant mortality national (2003)
DK Eastern region	35	3,2	4,4
BE Flanders	60	2,9 *	4,7 [§]
FR Ile-de-France	134	2,7	4,0
DE Hesse	52	2,7	4,2
IT Lazio	49	3,3	4,6
NL Eastern & Central	40	3,6	4,8
PL Wielko/Lubiskie	43	5,0	7,0
PO Northern	35	2,7	4,1
UK Trent	55	3,9 *	5,3
UK Northern	30		
All regions	485	--	--

Source : EUROSTAT: Population Statistics * = data for 2000, § = data 2004

Inclusions in the MOSAIC cohort, births 22-31 weeks of gestational age

Region	N of inclusions
Eastern Region, Denmark	391
Flanders, Belgium	793
Ile-de-France, France	1532
Hesse, Germany	746
Lazio, Italy	672
Eastern & central region, NL	562
Wielkopolska & Lubuskie, Poland	571
Northern Region, Portugal	409
Trent, UK	1000
Northern Region, UK	550
Total	7226



Outcomes of pregnancy in the MOSAIC cohort,
all births 22-31 weeks of GA

	N	%
TOP for congenital anomalies	587	8.1
TOP for other reasons	103	1.4
Fetal death before labor	924	12.8
Perpartum fetal death	214	3.0
Fetal death timing unknown	193	2.7
Labor ward death	220	3.0
Death in neonatal unit	759	10.5
Discharge from hospital	4226	58.5
Total	7226	100.0

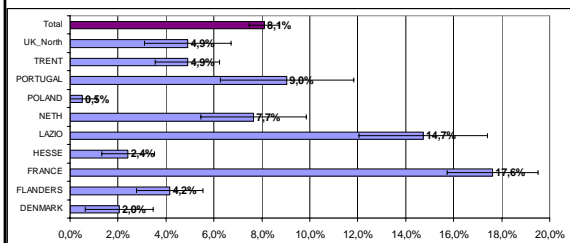


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TOP for CA as a % of total MOSAIC cohort





Terminations of pregnancy among stillbirths 22/31weeks

Year 2003	Total Stillbirths	TOP	
		N	%
DE Denmark	60	10	17
BE Flanders	212	50	24
FR Ile-de-France	629	330	52
DE Hesse	127	22	17
IT Lazio	215	102	47
NL Eastern/Central	163	49	30
PL Wielka/Lubiskie	132	5	4
PO Northern	119	39	33
UK Trent	228	51	22
UK Northern	136	32	24
All regions	2021	690	34



Reasons for terminations of pregnancy

REGION	Congenital anomalies %	Maternal reasons %	Other reasons %	Unknown %	N
DE Denmark	80	0	10	10	10
BE Flanders	66	12	22	0	50
FR Ile-de-France	82	5	13	0	330
DE Hesse	82	9	9	0	22
IT Lazio	97	1	2	0	102
NL Eastern/Central	88	8	4	0	49
PL Wielka/Lubiskie	60	20	20	0	5
PO Northern	95	0	3	3	39
UK Trent	96	2	2	0	51
UK Northern	84	0	0	16	32
Total	85	5	9	1	690



Other reasons for TOP

- Preterm rupture of membranes
- Infection/CMV
- Severe growth restriction
- Twin to twin transfusion syndrome
- Social reasons

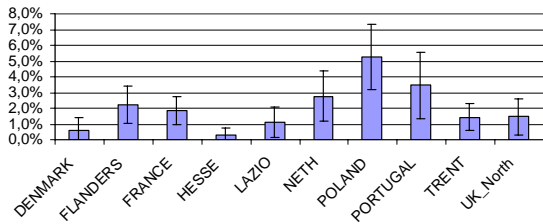


Terminations of pregnancy as % of MOSAIC cohort

- ◆ Differences in policies and practices with respect to TOP for CA
 - Legal context (Poland/Portugal)
 - Existence of systematic screening policies (France, yes; Netherlands,no)
 - Timing of screening scan (early - UK, late - France)
- ◆ Situation in Denmark
 - No systematic screening ?
 - Earlier terminations ?
 - Underreporting?



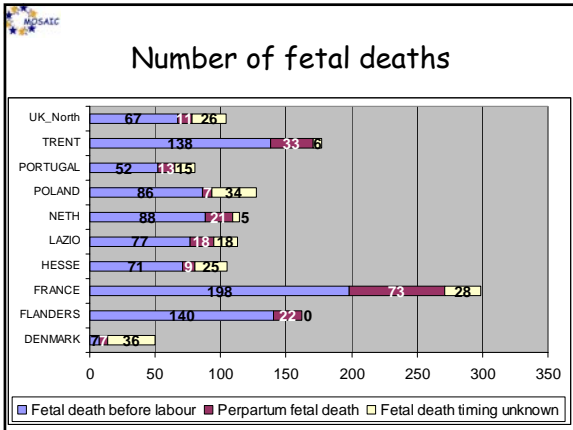
Neonatal death associated with congenital anomaly among live born infants

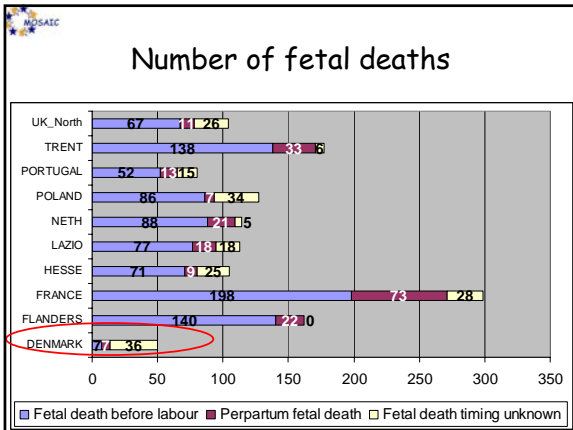


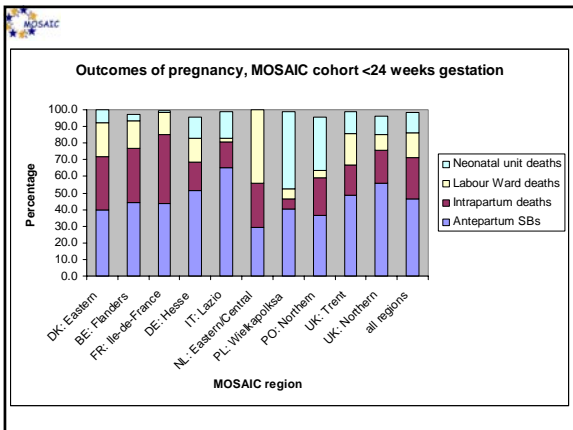


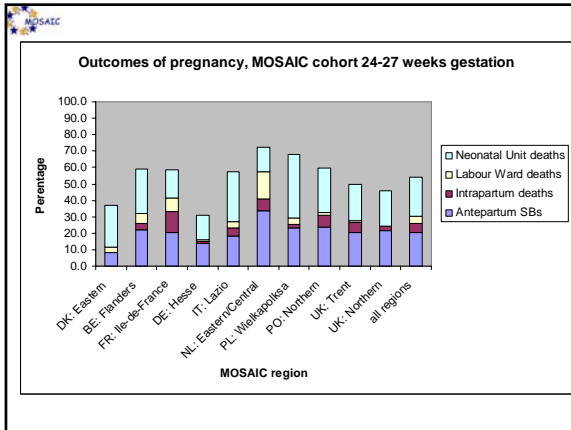
Outcomes of pregnancy in the MOSAIC cohort, all births 22-31 weeks of GA

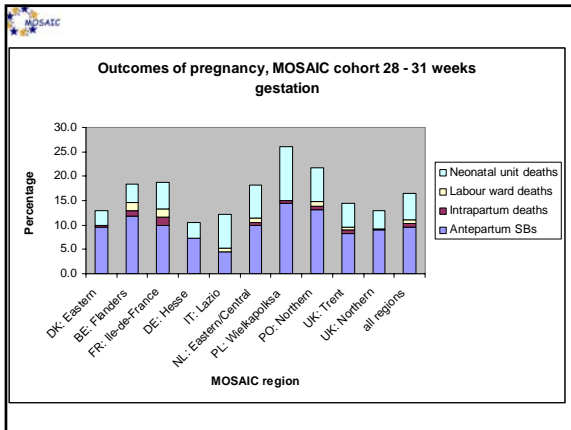
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Population for analysis of in-hospital mortality (deaths in labor ward and in neonatal unit) and morbidity

- live births
- 24-31 weeks of GA
- Exclusion of lethal congenital anomalies



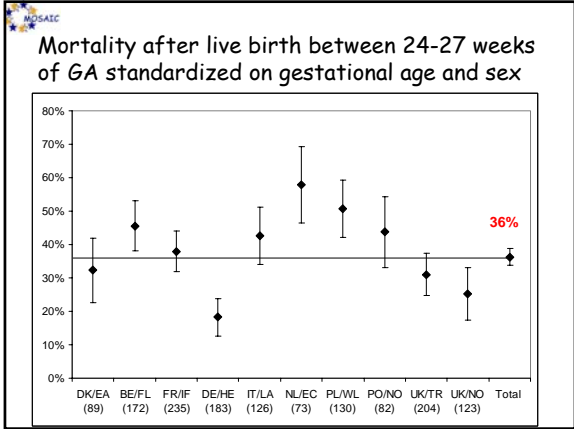
Mortality after live birth between 24-31 weeks of GA, crude rate and standardized on gestational age and sex

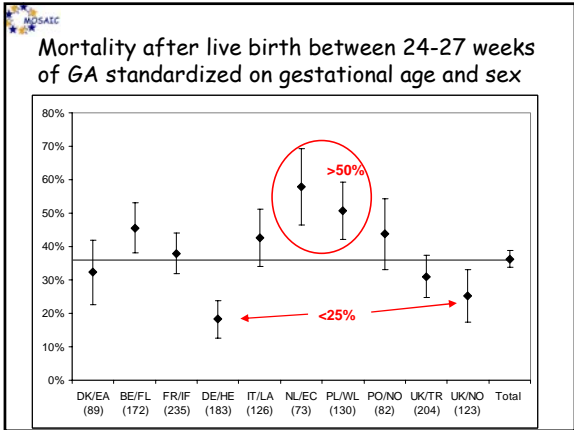
Country, region	Crude rate	95% CI	Standardized rate	95% CI
DK Eastern	11	7-14	11	8-14
BE Flanders	16	13-19	16	13-18
FR Ile-de-France	15	12-17	16	13-18
DE Hesse	8*	6-10	7*	5-9
IT Lazio	18	14-21	18	14-21
NL East/Central	16	12-19	21*	18-24
PL Wileko/Lub.	24*	20-29	21*	18-25
PO Northern	16	11-20	16	13-20
UK Trent	12	9-14	12	10-15
UK Northern	11	8-14	9*	7-12
All regions	14	13-15	--	--

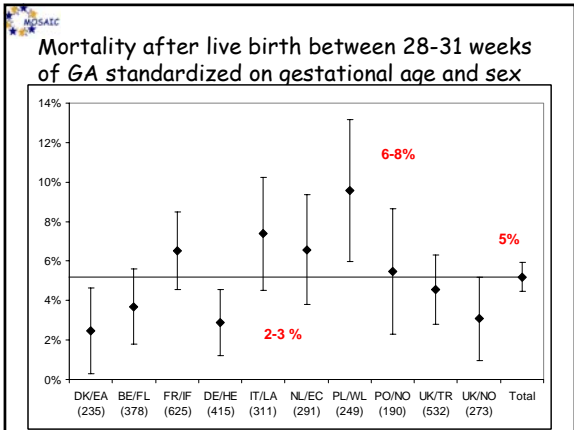


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PO Northern	16	11-20	16	13-20
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Crude and standardized rates of neurological morbidity (IVH grades III & IV + PVL) babies discharged alive from hospital

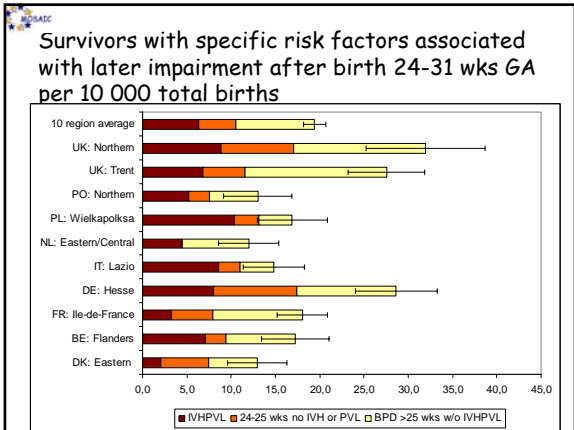
	Total	N	CR ¹	SR ²	95%CI
DK: Eastern	268	7	3*	3*	1-5
BE: Flanders	461	43	9	10	8-12
FR: Ile-de-France	726	28	4*	4*	2-5
DE:Hesse	550	42	8	7	5-9
IT: Lazio	356	42	12	12*	9-16
NL: East/Central	307	18	6	6	3-9
PL: Wielko/Lub	284	44	15*	17*	12-21
PO:Northern	228	18	8	8	5-11
UK:Trent	649	39	6	6	4-8
UK: Northern	338	26	8	7	4-9
All region avg	4167	307	7	--	7-8

Crude and standardized rates of neurological morbidity (IVH grades III & IV + PVL) babies discharged alive from hospital

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BE: Flanders	461	43	9	10	8-12
FR: Ile-de-France	726	28	4*	4*	2-5
DE:Hesse	550	42	8	7	5-9
IT: Lazio	356	42	12*	12*	9-16
NL: East/Central	307	18	6	6	3-9
PL: Wielko/Lub	284	44	15*	17*	12-21
PO:Northern	228	18	8	8	5-11
UK:Trent	649	39	6	6	4-8
UK: Northern	338	26	8	7	4-9
All region avg	4167	307	7	--	7-8

Crude and standardized rates of BPD (oxygen dependence or mechanical ventilation at 36 weeks), babies discharged alive from hospital

	Total	N	CR ¹	SR ²	95%CI
DK: Eastern	273	28	10	11	8-15
BE: Flanders	461	65	14	15	12-17
FR: Ile-de-France	716	100	14	14	11-16
DE:Hesse	532	100	19	16	13-18
IT: Lazio	358	34	9*	10*	8-13
NL: East/Central	306	34	11	12	8-15
PL: Wielko/Lub	253	39	15	15	11-20
PO:Northern	217	26	12	13	9-16
UK:Trent	649	121	19	19	16-21
UK: Northern	323	82	25*	22*	18-26
All region avg	4088	629	15	--	14-16



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Conclusion

- Comparing mortality and morbidity of very preterm babies in Europe is not easy
- The principal reason is differing practices related to:
 - Terminations of pregnancy
 - Differing limits for active intervention in case of extremely preterm birth

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Conclusion

- It is essential to include several different indicators of outcome
 - Terminations of pregnancy
 - Fetal mortality
 - Morbidity
- The ranking of regions changes depending on which indicator is selected



Discussion points and questions

- Is underreporting still a problem for stillbirths ?
- Are there other population characteristics that explain differences in mortality ?
 - Medical complications of pregnancy
 - Social factors, including mother's country of birth
 - Other medical practices
- What is the impact of these differences on rates of impairment in childhood ?



The MOSAIC research group

Steering committee

- E Papiernik (project coordinator), J. Zeitlin (Scientific coordinator), G. Bréart (Paris), E. Draper (Leicester), L. Kollée (Nijmegen)

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- Germany, L. Gortner, W. Kunzel, B. Misselwitz
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- Netherlands, L. den Ouden, L. Kollée, G. Visser
- Poland, G. Breborowicz, J. Gadzinowski, J. Mazela
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