

September 20th, 2023 09:00 - 11:00

PARALLEL SESSION 5 - EPIDEMIOLOGY 1

ID 709. SURVIVAL ACCORDING TO SEX AT BIRTH AMONG EXTREMELY PRETERM FETUSES: A PAN-EUROPEAN STUDY FROM THE “RECAP PRETERM” PLATFORM OF COHORT AND REGISTER DATA

Dr Andrei Morgan^{1,2,3}, Dr Helen Collins⁴, Gonçalo Gonçalves⁵, Professor Ulrika Åden⁶, Adrien Aubert¹, Deborah Bamber⁴, Professor Henrique Barros⁷, Valérie Benhammou¹, Josphine Bilsteen⁸, Dr Marina Cuttini⁹, Professor Elizabeth Draper⁴, Dr Katriina Heikkilä¹⁰, Professor Samantha Johnson⁴, Dr Karin Källén¹¹, Tuuli Land¹², Mariam Lashkariani¹³, Professor Jo Leeber¹⁴, Professor Liisa Lehtonen¹⁵, Professor Rolf Maier¹⁶, Professor Neil Marlow³, Dr Johanna Metsälä¹⁷, Dr Yanyan Ni¹⁸, Mari-Leen Pärn¹⁹, Charlotte Powell⁴, Dr Anna Pulakka²⁰, Professor Kari Risnes²¹, Carina Rodrigues⁷, Professor Sven Sandin¹³, Dr Iemke Sarrechia¹⁴, Dr Mariane Sentenac¹, Alessandra Valletti⁹, Professor Heili Varendi¹², Dr Weiyao Yin¹³, Dr Milla Ylijoki¹⁰, Professor Eero Kajantie^{17,20}, Dr Jennifer Zeitlin¹

¹INSERM U1153 EPOPé – Obstetrical, Perinatal and Pediatric Epidemiology Team, Paris, France, ²Department of Neonatology, Hôpital Nord, Association Publique – Hôpitaux de Marseille, Marseille, France, ³Department of Academic Neonatology, EGA Institute for Women's Health, University College London, London, United Kingdom, ⁴TIMMS, Department of Health Sciences, University of Leicester, Leicester, United Kingdom, ⁵Human-Centered Computing and Information Science Centre, INESC TEC, Porto, Portugal, ⁶Department of Women's and Children's Health, Karolinska Institutet, Stockholm, Sweden, ⁷Instituto de Saúde Pública da Universidade do Porto, Porto, Portugal, ⁸University of Copenhagen, Copenhagen, Denmark, ⁹Clinical Care and Management Innovation Research Area, Bambino Gesù Children's Hospital, IRCCS, Rome, Italy, ¹⁰University of Turku, Turku, Finland, ¹¹Lundt University, Lundt, Sweden,

¹²SA Tartu Ülikooli Kliinikumi , Tartu, Estonia, ¹³Department of Medical Epidemiology and Biostatistics, Karolinska Institutet, Stockholm, Sweden, ¹⁴Department of Family Medicine and Population Health, University of Antwerp, Antwerp, Belgium, ¹⁵Division of Neonatology, Turku University Hospital, Turku, Finland, ¹⁶Children's Hospital, Philipps University, Marburg, Germany, ¹⁷Finnish Institute for Health and Welfare, Helsinki, Finland, ¹⁸Division of Community Medicine and Public Health Practice, HKU Med, LKS Faculty of Medicine, The University of Hong Kong, Hong Kong, China, ¹⁹Tartu University Hospital, Tartu, Estonia, ²⁰University of Oulu, Oulu, Finland, ²¹Faculty of Medicine and Health Sciences, Norwegian University of Science and Technology , Trondheim, Norway

BACKGROUND: Many studies show that females born extremely preterm have lower mortality than males. However, results are not completely concordant across studies, and survival differences may have changed over time. Erroneous beliefs about biological differences in survival could be self-perpetuating. We examined the consistency of male–female survival differences among extremely preterm (EP: 22–26 weeks gestational age (GA)) births in relation to survival to hospital discharge across multiple countries and epochs.

METHODS: Population–based data from Nordic (Denmark, Finland, Norway and Sweden) Registries spanning 1967–2016 and cohorts (ACTION (Italy, 2003–05), EPIBEL (Belgium, 1999–2000), EPICE (19 regions in 11 European countries, 2011–12), EPICure–2 (England, 2006), EPIPAGE–2 (France, 2011), EST0203 (Estonia 2002–03), EXPRESS (Sweden, 2004–07), and PIPARI (Finland, 2001–06)) were analysed using the RECAP Preterm platform (<https://platform.recap-preterm.eu>) which controls transmission of potentially identifiable data. We used modified Poisson regression models to estimate relative risks (RR) of survival for live births, including adjustment for GA (for cohorts) and GA, year, maternal age and multiple status (for Registries),

with sub-analyses of Registry data by epoch (before 1990, 1990–1999, 2000–2016) and by epoch and GA; results were pooled using R package ‘metafor’.

RESULTS: 23904 live births were analysed (Registries: 17432; cohorts: 6472); 11093 (46.4%) were female. Overall, male survival (6354 of 12811, 49.60%) was lower than for females (6145 of 11093, 55.40%; unadjusted pooled risk ratio (RR) 0.95, 95% confidence interval (CI) 0.92 – 0.98, $p < 0.001$; pooled RR adjusted for GA 0.95, 95%CI 0.93 – 0.98, $p = 0.002$). Fully-adjusted pooled RRs (aRR) for the Register data were 0.94 (95%CI 0.83 – 1.07, $p = 0.347$) during the first, 0.99 (95%CI 0.98 – 1.00, $p = 0.035$) during the second and 0.95 (95%CI 0.90 – 1.00, $p = 0.046$) during the third epoch. No statistically significant differences were seen according to GA other than at 26 weeks’ GA in 2000–2016 (pooled aRR 0.98, 95%CI 0.97 – 0.99).

CONCLUSIONS: More live births were male, but survival to hospital discharge was better for live born females. Although point estimates generally pointed to a female survival advantage, there was evidence of differences according to country and time period. Perceived biological differences may be mediated by social context.

| Time period | 23 weeks | 24 weeks | 25 weeks | 26 weeks |
|-------------|---------------------------------|---------------------------------|---------------------------------|--------------------|
| Pre-1990 | 0.94 (0.82 – 1.07) ^a | 1.00 (0.87 – 1.15) ^a | 0.91 (0.73 – 1.15) ^a | 0.99 (0.97 – 1.02) |
| 1990-1999 | 1.15 (0.88 – 1.51) ^a | 0.86 (0.67 – 1.11) ^a | 0.99 (0.96 – 1.01) | 1.00 (0.99 – 1.01) |
| 2000-2016 | 0.94 (0.84 – 1.05) ^a | 0.98 (0.96 – 1.00) | 0.99 (0.98 – 1.00) | 0.98 (0.97 – 0.99) |

^a Data from Denmark not available as insufficient numbers of live births.

Risk ratios (95% confidence intervals) according to gestational age for male relative to female survival to 6 months from Nordic Registries (Denmark 1978–2016, Finland 1987–2016, Norway 1967–2016 and Sweden 1974–2016).



Risk ratios (95% confidence intervals) according to gestational age for male relative to female survival to 6 months from Nordic Registries (Denmark 1978–2016, Finland 1987–2016, Norway 1967–2016 and Sweden 1974–2016).

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ID 599. ASSOCIATION BETWEEN MATERNAL MIGRATION BACKGROUND AND MORTALITY AMONG EXTREMELY PRETERM INFANTS

Doctor Joaquim Vidiella-Martin^{1,2}, Doctor Jasper Been^{3,4}

¹Nuffield Department of Primary Care Health Sciences, University of Oxford, Oxford, United Kingdom, ²Erasmus School of Economics, Tinbergen Institute and Erasmus Centre for Health Economics Rotterdam (EsCHER), Erasmus University Rotterdam, Rotterdam, Netherlands, ³Division of Neonatology, Department of Neonatal and Paediatric Intensive Care, Erasmus MC Sophia Children's Hospital, Rotterdam, Netherlands, ⁴Department of Obstetrics and Gynaecology, Erasmus MC Sophia Children's Hospital, Rotterdam, Netherlands

Background: Disparities exist in perinatal outcomes and evidence is increasing that differential care provision across population subgroups may in part be responsible. In the Netherlands, when delivery is imminent at 24–25 weeks of gestation, a decision whether or not to offer active neonatal care is made in agreement with parents following counselling. We investigated the relationship between maternal migration background and admissions to and mortality within NICUs at the edge of viability.

Methods: National population–based study using individually–linked data of births in the Netherlands with household–level income tax records and municipality and mortality registers. The primary study population consisted of livebirths (2010–2017) between 24+0 weeks and 25+6 weeks of gestation. We explored the link between maternal migration background (i.e., first–or–second–generation migrant mother) and admissions to NICUs and mortality within the first week, month, and year of life. We estimated logistic regressions adjusted for year of birth, maternal age, parity,

household income, sex, gestational age, multiple birth, and small-for-gestational age. We included unit-specific fixed effects.

Results: Among the 1,405 livebirths, 546 (39%) had mothers with maternal migration background. 1,243 infants (89%) were admitted to a NICU. 361 (26%) of those died within the first week of life, 544 (39%) in the first month, and 652 (46%) in the first year of life. Infants born to first- or second-generation migrant mothers tended to be more likely to be admitted to a NICU (OR 1.37, 95%CI 0.93–2.04). In the fully adjusted model, infants born to migrant mothers had lower odds of mortality within the first week (OR 0.77, 95%CI 0.54–1.09), first month (OR 0.71, 95%CI 0.53–0.95), and first year of life (OR 0.69, 95%CI 0.52–0.91). Findings were robust in sensitivity analyses. These disparities were not observed for babies born at 26–27 weeks of gestation.

Conclusion: Infants born to migrant mothers at the edge of viability had lower odds of mortality within the first year of life. This is unlikely to be explained by differences in care across NICUs. Further research is needed to understand the underlying mechanisms driving these disparities, including differential parental preferences for active care of extremely preterm infants.



Table 1: Association between migration background and NICU admissions and mortality

| | Model 1 | Model 2 | Model 3 |
|---------------------------------|---------------------|---------------------|---------------------|
| NICU admissions (N=1,405) | 1.22 [0.86,1.73] | 1.47 [1.00,2.14] | 1.37 [0.93,2.04] |
| First-week mortality (N=1,243) | 0.69 [0.51,0.94] | 0.66 [0.47,0.92] | 0.77 [0.54,1.09] |
| First-month mortality (N=1,243) | 0.76 [0.60,0.98] | 0.66 [0.50,0.88] | 0.71 [0.53,0.95] |
| First-year mortality (N=1,243) | 0.76 [0.60,0.96] | 0.63 [0.48,0.82] | 0.69 [0.52,0.91] |

Odds ratio of first-or-second generation migration background. Reference category = no migration background. 95% confidence intervals in brackets.

Model 1: unadjusted model including time trends.

Model 2: adjusted for potential confounders - sex, gestational age, multiple births, SGA, congenital anomalies, parity, maternal age at birth, and household income quintile.

Model 3: adjusted for potential confounders and including consortia fixed effects.

Association between migration background and NICU admissions and mortality

Association between migration background and NICU admissions and mortality

None declared

ID 598. THE IMPACT OF EXTREME TEMPERATURES ON BIRTH OUTCOMES: A NATIONWIDE POPULATION-BASED STUDY

Lizbeth Burgos Ochoa¹, Prof. Pilar García-Gómez², Prof. Eric Steegers¹, Prof. Tom Van Ourti^{2,3}, Dr. Loes Bertens¹, **Doctor Jasper Been**^{1,4}

¹Department of Obstetrics and Gynaecology, Erasmus MC Sophia Children's Hospital, Rotterdam, Netherlands, ²Erasmus School of Economics, Tinbergen Institute and Erasmus Centre for Health Economics Rotterdam, Rotterdam, Netherlands, ³Erasmus School of Health Policy and Management, Erasmus University Rotterdam, Rotterdam, Netherlands, ⁴Division of Neonatology, Department of Neonatal and Paediatric Intensive Care, Erasmus MC Sophia Children's Hospital, Rotterdam, Netherlands

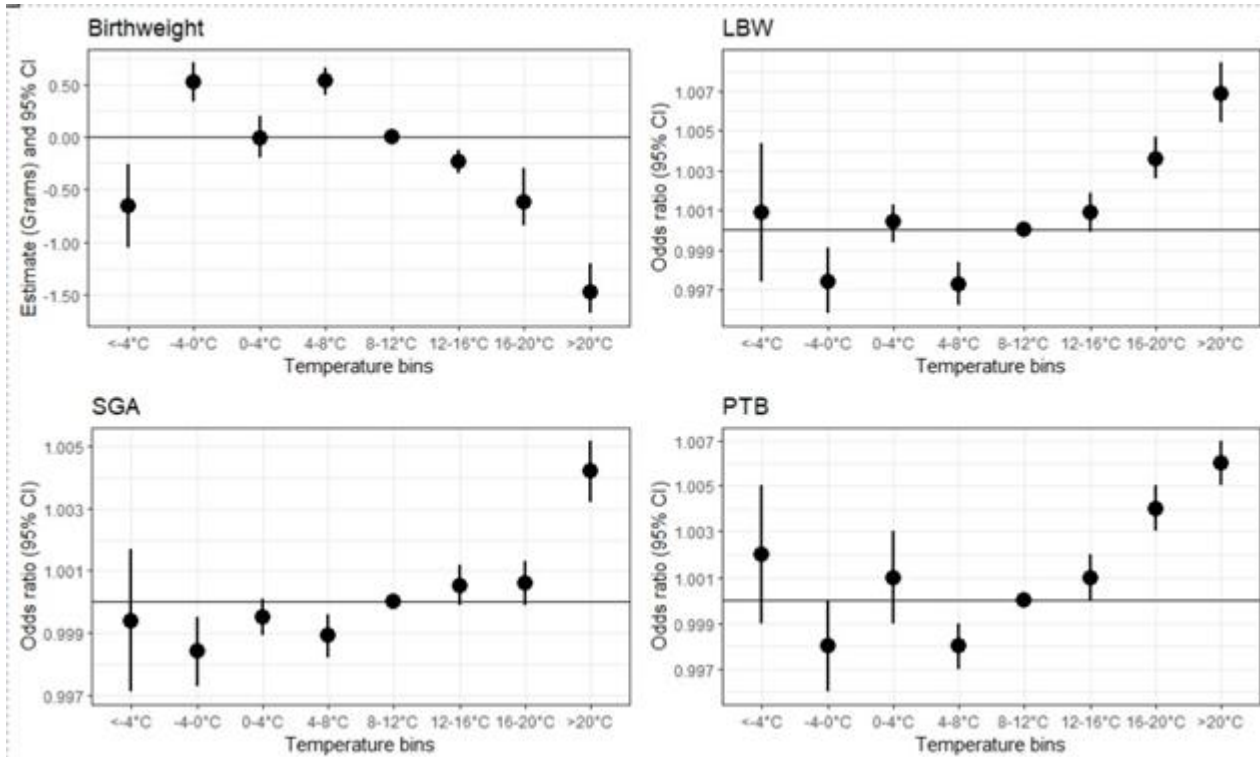
Background. The aim of this study was to investigate the causal impact of in-utero exposure to extreme temperatures on key birth outcomes, i.e., birthweight, low birth weight (LBW), small-for-gestational-age (SGA), and preterm birth (PTB) in the Netherlands. Moreover, we examined the role of socioeconomic status (SES) as moderator for the effect of interest.

Methods. We included singleton births that occurred in the Netherlands between 2003 and 2017 (N=2,476,772). Daily weather measurements were linked to the Dutch perinatal registry using maternal residential postcode. The exposure corresponded to the number of days during the gestation period in which the daily mean temperature fell into each of mutually exclusive temperature bins, where the 8–12 °C bin was used as reference. Logistic regression models were used to assess the effect of temperature exposure on birth outcomes. To identify a causal effect our approach exploited the unpredictability of daily temperature fluctuations while accounting for seasonal and underlying trends. Interaction terms between the exposure and SES

indicators (household income, education, and neighbourhood SES) were used to investigate the effect heterogeneity across levels of SES.

Results. In-utero exposure to an additional hot day (mean temperature $> 20^{\circ}\text{C}$), relative to a day within the $8 - 12^{\circ}\text{C}$ range, was related to increased odds of LBW (OR[95%CI]= 1.007 [1.005, 1.009]), SGA (OR[95%CI]= 1.004 [1.003, 1.005]), and PTB (OR[95%CI]= 1.006 [1.005, 1.007]), and a reduction in birthweight of 1.47 g (95%CI= 1.20, 1.60). Additionally, exposure to an additional cold day ($< -4^{\circ}\text{C}$) was related to a reduction of birthweight by 0.66 grams (95%CI= 0.27, 1.05). We observed that SES moderated the effect of in-utero temperature exposure on birth outcomes and that the observed effect was the most detrimental for births in low SES households.

Conclusion. We found that exposure to extreme temperature during pregnancy has an adverse impact on birth outcomes in the Netherlands. The projected increases in extreme temperatures in the face of the climate crisis may further exacerbate health disparities in early- life.



The effect of in utero exposure to one additional day falling in certain temperature bin on birth outcomes (relative to a day with a mean temperature of 8–12 °C).

The effect of in utero exposure to one additional day falling in certain temperature bin on birth outcomes (relative to a day with a mean temperature of 8–12 °C).

None declared

ID 353. Twelve-year neonatal outcomes of very low birthweight infants from the South American NEOCOSUR neonatal Network

MD Ivonne D'Apremont¹, Statistical Claudia Musalem², MD Jose Luis Tapia¹, MD Jorge Fabres¹, Mathematical Guillermo Marshall¹

¹Pontificia Universidad Católica de Chile, SANTIAGO, Chile, ²Neocosur Neonatal Network, SANTIAGO, Chile

Background: NEOCOSUR is a nonprofit collaborative neonatal network that continuously evaluates VLBW infant's outcomes in the region. The participant centers are university-affiliated and represent both public and private institutions whose primary mission is the improvement of neonatal care and outcome in this region.

Objective: To describe main outcomes in perinatal care, mortality, morbidities and survival without major morbidities of VLBW infants admitted in 20-selected level III NICUs, from five South American countries: Argentina, Chile, Paraguay, Peru and Uruguay throughout 12 years.

Design and Methods:

Patients: All inborn infants with birthweight (BW) 500–1500 grams and gestational age (GA) 230 to 336 weeks in the participating centers. Bio-demographic data was collected online from 01/01/2010 to 12/31/2021, with predefined diagnostic criteria and analyzed by a central database unit.

Design: Retrospective analysis of prospectively collected data.

Descriptive analysis, mean and standard deviation values were used for numerical variables, whereas frequency and proportion values were used for categorical variables.



The former were compared using Student's t test and the latter, using the χ^2 test. Significance was defined with p-values <0.05.

SPSS version 17 software (IBM Corp, Armonk, NY, USA) was used for statistical analysis.

The Research Ethics Committees of all the participating centres approved the data collection protocol.

Results: 14,833 VLBW infants were enrolled during the study period. Mean BW was 1,086 g (\pm 277), mean GA 28.6 weeks \pm 2.7. Death in the delivery room was 4%(n=600) and Mortality after admission 19,9% (n= 2.942)

Results for main outcomes are presented in table 1.

Conclusions: 12-year outcomes in the NEOCOSUR's network show important progress in obstetrical and neonatal care and especially significant reduction in global mortality.

There was a significant change in survival without major morbidities throughout the study period.

There is a high variability among centers for main outcomes.



Table 1 Perinatal Results in 20 NEOCOSUR centers

| Condition | Global n=14,833 | 2016-2013 n=5,243 | 2014-2017 n=5,411 | 2018-2021 n=4,179 | p-value |
|------------------------------|--------------------|----------------------|----------------------|----------------------|---------|
| Global Mortality | 24.1% | 25.2% | 22.4% | 23.4% | 0.007 * |
| n | 3542 | 1285 | 1361 | 918 | |
| Death in Delivery room | 4.0% | 4.1% | 4.0% | 4.4% | — |
| n | 908 | 317 | 324 | 169 | |
| Death after admission | 19.9% | 20.8% | 18.2% | 17.8% | — |
| n | 2642 | 3046 | 3147 | 2499 | |
| Maternal Age mean (SD) | 28.9 ± 7 | 28.4 ± 7 | 28.8 ± 7 | 29.6 ± 7 | 0.000 * |
| Pregnancy control | 90.0% | 90.4% | 90.7% | 89.3% | 0.054 |
| Multiple Gestation | 22.0% | 20.9% | 22.4% | 22.5% | 0.145 |
| Perinatal steroids | 83.7% | 81.2% | 84.9% | 86.3% | 0.000 * |
| C-section | 76.2% | 74.4% | 76.4% | 77.8% | 0.000 * |
| Major congenital anomalies | 4.7% | 5.3% | 4.6% | 4.1% | 0.021 * |
| Male gender | 51% | 52.2% | 52.2% | 54.4% | 0.066 * |
| Gestational Age mean (SD) | 28.8 ± 2.7 | 28.8 ± 2.7 | 28.6 ± 2.8 | 28.6 ± 2.7 | 0.415 |
| Birth Weight mean (SD) | 3086 ± 277 | 3085 ± 274 | 3084 ± 277 | 3089 ± 256 | 0.735 |
| Surfactant use | 39.6% | 28.7% | 58.7% | 60.3% | 0.011 * |
| Mechanical ventilation | 63.3% | 63.3% | 63.8% | 62.7% | 0.582 |
| Mean days | 5 | 4 | 5 | 5 | |
| CPAP | 66.8% | 64.7% | 65.4% | 71.8% | 0.000 * |
| Mean days | 5 | 5 | 5 | 6 | |
| Early onset Sepsis | 2.8% | 2.2% | 2.4% | 2.8% | 0.050 |
| Late onset Sepsis | 19.3% | 21.1% | 19.9% | 17.3% | 0.000 * |
| O ₂ 36 weeks | 25.5% | 24.4% | 23.3% | 23.3% | 0.482 |
| HIC G III - IV | 9.6% | 9.6% | 9.4% | 9.1% | 1.385 |
| Global ROP | 19.1% | 18.4% | 17.8% | 19.4% | 0.281 |
| NEC | 11.1% | 11.4% | 10.4% | 10.5% | 0.019 * |

O₂ 36 weeks and ROP calculated over survivors > 28 days

None declared