Better Statistics for Better Health
for pregnant women and their babies

Porto, Portugal
June 2-3, 2006
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The Better Statistics for Better Health congress is hosted by the University of Porto Medical School Department of Hygiene & Epidemiology, with generous funding support from the European Commission Public Health Program. The EURO-PERISTAT project is coordinated by Assistance Publique Hôpitaux de Paris and INSERM U-149.

**A congress for perinatal health professionals & policymakers**

**Friday June 2**

8:30-9:30  Coffee and registration

9:30-12:00 The EURO-PERISTAT II project: overview and analyses of indicators of perinatal health and health care in Europe

12:00-14:00 Buffet Lunch and Poster Session A

14:00 -15:30 Panel Session I - Improving Data Quality

15:30-17:00 Coffee and Poster Sessions B and C

**Saturday June 3**

9:00-10:45  Data Providers’ Workshop

10:30-11:00 Coffee break

11:00-12:30 Panel Session II - Getting Used: Strategies for Increasing the Utilization of Perinatal Health Information

12:30-14:00 Lunch

14:00 -16:30 Roundtable Discussion - Translating Better Statistics for Better Health Policy: What Decision-Makers Need

- Zilvinas Padaiga, Minister of Health of Lithuania
- José Pereira Miguel, High Commissioner for Health in Portugal
- William Dunlop, President of the European Board and College of Obstetrics and Gynaecology (EBCOG)
- Kari Raivio, Chancellor of Helsinki University and President of the League of European Research Universities
- Antoni Montserrat, European Commission, DG-SANCO

**Program Overview**

June 2-3 2006

FOR

BETTER

FOR

pregnant women and their babies
Detailed Program

Friday, June 2

8:30-9:30
Coffee and registration

9:30-12:00
Welcome & Introduction to the EURO-PERISTAT II project
Opening remarks: Henrique BARROS
Moderator: Jennifer ZEITLIN
- Project overview and accomplishments: Jennifer Zeitlin
- Developing new indicators of perinatal health - Jennifer Zeitlin, Marie Hélène Bouvier-Colle, Alison Macfarlane, Sophie Alexander
- Integrating new member states into EURO-PERISTAT: Mika Gissler
- Cerebral palsy and perinatal indicators – input of CP morbidity registers: Christine Cans
- Risk factors for perinatal mortality: Sabine Anthony

12:00-14:00
Buffet Lunch (1 hour) and Poster Session A (1 hour)

14:00 -15:30
Panel Session I - Improving Data Quality
Moderator: Sophie ALEXANDER
- Linking data from different sources to improve quality and ask new questions
  - Marie Hélène Bouvier-Colle, France - Linking death and birth registers to study maternal mortality
  - James Chalmers, UK - Linking geographical information system with national maternity records and the location of obstetric facilities.
  - Irene Volpi, Italy - The use of current data for studying the risk of hospitalization during pregnancy in Tuscany.

A view on several European health information systems
- Kari Klungsøyr, Norway - The Medical Birth Registry of Norway: Population based epidemiological research and surveillance
- Sabrina Prati, Italy - Redesigning the Italian Perinatal Statistical System: opportunities and some limits.
- Gwyneth Thomas, UK - New Sources of data on perinatal health for Wales

15:30-17:00
Coffee and Poster Sessions B & C
Session A  **Perinatal health information systems & indicators** (13:00 – 14:00)

- Inese Birzule, Latvia: *Perinatal Health Statistics Data Quality in Latvia*
- Béatrice Blondel, France: *The French Perinatal Surveys: a method for collecting routine data and data for special topics*
- Emanuele Ciotti *et al.*, Italy: *Postpartum depression – how to measure it and why. Research on possible indicator*
- Maria Pia Fantini *et al.*, Italy: *Cesarean Delivery Indicators: a study of reliability among different methods for detection of c-section rate*
- Cristiano Marini *et al.*, Italy: *Neonatal mortality by prognostic factors: an exercise in birth-death data linkage for the Lazio region in Italy*
- Rhonda Small, Australia: *Adding migration indicators to routine perinatal data collections: a proposal from Australia*

Session B  **Analyzing data from routine sources to evaluate practices and outcomes** (15:30 – 16:15)

- Stefania Arniani *et al.*, Italy: *Lifestyles during pregnancy: BMI and smoking*
- Maria Pia Fantini *et al.*, Italy: *Risk adjustment for interhospital comparison of cesarean section rates*
- Steve Jarvis and Svetlana V. Glinianaia, SCPE: *Fetal versus neonatal growth standards for the analysis of perinatal outcomes by size at birth*
- Martin Langer *et al.*, Austria: *Perinatal results after in-utero-transfer: impact of psychotherapeutic counseling*
- Jens Langhoff-Roos *et al.*, Denmark: *Natural birth*
- Jens Langhoff-Roos *et al.*, Denmark: *Maternal and fetal complications following intended vaginal and cesarean delivery in Denmark 1997-2004*
• Marianne Mead, UK: *Three site study of midwives’ intrapartum observation/care and risk perception in the UK, Belgium (Flanders) and the north east of France*

• Patrick Rozenberg *et al*, France: *Assessment of the performance of first trimester combined screening followed by routine second trimester ultrasound examination for Down Syndrome screening*

• Stephan Schmidt *et al*, Germany: *Use of perinatal-data to demonstrate differences in perinatal care*

• Polonca Truden-Dobrin *et al*, Slovenia: *Singletons & twins after sub-fertility treatment*

**Session C**  
**Assessing Geographic and Social Inequalities** (16:15 – 17:00)

• Maria Pia Fantini *et al*, Italy: *Temporal & geographic trends of infant mortality in Italy*

• Robyn Gabel and Leo Smith, United States: *The Use of Data to Increase Funding for the Reduction of Prematurity*

• Kotryna Kuodytė & Aldona Gaižauskienė, Lithuania: *The changes of risk factors of perinatal mortality in Lithuania*

• Alison Macfarlane and Joanne Maher, UK: *Trends in inequalities in the outcome of pregnancy and associated socio-demographic factors in England and Wales*

• Guy Martens and Hendrik Cammu, Belgium: *Social inequalities in perinatal outcome in Flanders*

• Waldemar Skawinski *et al*, Poland: *Statistical analysis of health inequalities in Poland based on routine laboratory tests and selected health indicators*

• Avi Tellmann, Estonia: *Socioeconomic differences in perinatal mortality in Estonia*

• Christian Vutuc *et al*, Austria: *Non-random spatial distribution of infant mortality in Austria 1984-2002*
9:00-10:45  **Data Workshop** for data providers and members of Scientific Committee

*All others are free during this period or may come early for the coffee break at 10:30

**Moderators:** Sabine ANTHONY and Karin VAN DER PAL-DE BRUIN

10:30-11:00  **Coffee break**

11:00-12:30  **Panel Session II - Getting Used: Strategies for Increasing the Utilization of Perinatal Health Information**

**Moderator:** Meg ZIMBECK

- Paul Defoort, Belgium - Using epidemiological data to shape and evaluate policy – the case ART funding policy in Belgium
- Frantisek Bauer, Slovakia - Use of analysis of perinatal mortality in the formation of interventional strategies in Slovakia and their implementation to praxis
- Björn Missetwitz, Germany - The Use of Quality-Indicators to advance the Quality of perinatal Health care
- EUROCAT Project - Monitoring policy implementation - Prevention of Neural Tube defects by Periconceptional Folic Acid Supplementation in Europe
- Jan Nijhuis, the Netherlands - PERISTAT: Did it influence Dutch policy and Dutch Obstetrics?

12:30-14:00  **Lunch**

14:00 -16:30  **Roundtable Discussion - Translating Better Statistics for Better Health Policy: What Decision-Makers Need from the Research Community**

**Moderators:** Henrique BARROS and Gérard BRÉART

- Meg Zimbeck, France: Making perinatal health information relevant to policymakers

**Roundtable Discussants:**

- Žilvinas Padaiga, Minister of Health of Lithuania
- José Pereira Miguel, High Commissioner for Health in Portugal
- William Dunlop, President of the European Board and College of Obstetrics and Gynaecology (EBCOG)
- Kari Raivio, Chancellor of Helsinki University and President of the League of European Research Universities
- Antoni Montserrat, European Commission, DG-SANCO
1. Marie-Hélène Bouvier Colle
Institut National de Santé et de Recherche Médicale (INSERM) Unité 149 – Paris, France

Linking Death and Birth Registers to Study Maternal Mortality

In European countries as well as in other developed countries, maternal mortality ratios that are based solely on ICD cause-of-death codes available from death certificates have been shown to underestimate maternal mortality. Previous studies conducted in European countries reported a 30 to 50% under-identification of maternal deaths through routine surveillance systems. Several methods for enhancing identification of maternal deaths have been proposed. One of the most powerful ones is the linkage of death and birth registers. Our objective was to measure underreporting of maternal mortality in official national statistics compared with the use of linkage of birth and death registers in France, and to provide a revised profile of maternal mortality.

The study period was 1999. Live births and fetal deaths certificates for 1998 and 1999 were matched with the “national register for identification of persons” to identify mothers who died in 1999, and in a second stage a second linkage with the cause-of-death register selected the corresponding death certificates. All cases were reviewed and classified by a panel of experts.

A total of 88 deaths that occurred during pregnancy or within 42 days of its end were identified and reviewed. Case ascertainment based solely on ICD cause-of-death codes was associated with a 20% underestimation of maternal mortality. The revised maternal mortality ratio was 9/100,000 live births. Half of the maternal deaths that were missed in official statistics were direct obstetric deaths. Assuming that all “possibly maternal” deaths were actually maternal increased under-estimation to 30%.

These results show the limitations of maternal mortality statistics based on ICD cause-of-death codes alone, and that improvement in the identification of maternal deaths is needed. Linkage of births and deaths registers should routinely be used in the ascertainment of maternal deaths, and can be easily implemented in countries with a long tradition of vital statistics surveillance systems. The feasibility of using other enhanced case-finding methods, more particularly focused on deaths during pregnancy or after abortion or ectopic pregnancy, should also be examined.

2. James Chalmers, Steven Williamson, Jillian Campbell, Mette Tranter
Information Services, NHS National Services – Edinburgh, Scotland

Linking Geographical Information System with National Maternity Records & the Location of Obstetric Facilities

Scotland’s population is concentrated around the central area, but there are significant numbers living in isolated areas who need adequate access to maternity services. To assist in planning services, we wished to answer the following: How long does it take women to travel from their home to the
nearest hospital? Are pregnant women at present attending their nearest hospitals? Does the population of mothers who live far from obstetric hospitals unusual in terms of measures such as age and parity? Are women who live far from a hospital at greater risk of having a baby “en route”; stillbirth or early neonatal death; complicated delivery, or being in hospital for longer than average?

**Methods:** We used a geographical information system loaded with data from national maternity records and the location of obstetric facilities.

**Results:** The results are presented as maps and charts. Most women in Scotland live within an hour of a consultant-led unit, and generally use the closest hospital. The more distant women are at higher risk of giving birth “en route” and have a longer prenatal stay. There is no detriment on outcome, but confidence intervals are wide because of the small numbers.

3. **Irene Volpi**, Stefania Arniani, Veronica Casotto, Franca Rusconi and Eva Buiatti

1Unit of Epidemiology, Regional Agency for Health of Tuscany – Florence, Italy
2Unit of Epidemiology Meyer University Hospital for Children – Florence, Italy

**The Use of Current Data for Studying the Risk of Hospitalization During Pregnancy in Tuscany**

Postponing reproduction times, and socio-demographic and cultural changes have probably varied the approach to pregnancy for what concerns the use of health services and health outcomes for women and newborn babies.

The objective of this study is investigating the possible association between hospitalisation during pregnancy and sociodemographic characteristics of women, and neonatal outcomes.

To this purpose it has been carried out the procedure of record-linkage between hospital discharge database and delivery assistance database. The former database allows one to reconstruct the "hospital history" of pregnant women; the latter allows one to detect births of women, and to get information about the mother and the newborn.

A total of 22% of women was hospitalised during pregnancy. A multivariate logistic analysis was performed to identify the factors associated with hospitalisation during pregnancy. The factors associated positively were: maternal age over 34 years (OR 1.27 95% CI: 1.16-1.38), under 25 years (OR: 1.26; 95% CI: 1.12-1.42) compared to the reference group (25-34 years old); low educational status (OR 1.24; 95% CI: 1.16-1.33); separated/divorced status (OR: 1.47; 95% CI: 1.21-1.77); foreigner (OR: 1.20; 95% CI: 1.07-1.34) and primipare (OR: 1.32; 95% CI: 1.23-1.42). This analysis also shows an almost double risk for those women having had a previous premature or underweight newborn baby.

4. **Kari Klungsøyr Melve, Lorentz M.Irgens, MD, PhD**

1Department of Public Health and Primary Health Care, University of Bergen, Norway
2The Medical Birth Registry, the Norwegian Institute of Public Health – Bergen, Norway

**The Medical Birth Registry of Norway: Population based epidemiological research and surveillance for nearly 40 years**

The Medical Birth Registry of Norway (MBRN) was established in 1967 with two major goals: Epidemiological surveillance of birth defects and perinatal health problems, and research on their causes and consequences. The Registry is based on compulsory notification of every birth above 12 weeks’ gestation including stillbirths and late abortions. A standardized notification form collects
information on demographic variables, maternal health, pregnancy and delivery complications, and pregnancy outcomes.

Valid information and ascertainment of cases are crucial aspects, and routines are established to enable ascertainment on several levels: To ensure medical notification of every newborn in the country, all MBRN records are routinely matched with those of the Central Person Registry, where national identification numbers of all live births in the country are generated. Dates of any infant deaths are also received by this linkage. Since 1999 the MBRN has received notification forms from neonatal intensive care units for all infants transferred to such units. This information is linked to that from delivery units, with improved quality of neonatal diagnoses. When clinicians notify doubt about diagnoses, additional information is actively sought on a later stage. For stillbirths weighing more than 500 grams, information about cause of death is actively sought, and since 2003 the MBRN has received autopsy reports directly from the pathological laboratories. At present the opportunity of electronic notification of births is established, and will become mandatory during 2006. This will provide further opportunities for quality assurance.

5. **Sabrina Prati, Alessandra Burgio, Marzia Loghi, Cinzia Castagnaro**  
   Italian National Statistical Institute – Rome, Italy  
   
   *Redesigning the Italian Perinatal Statistical System: opportunities and some limits*

For more than seventy years, the vital statistics registration system has been the main source of birth data in Italy. An individual birth survey collected data on births (live or stillbirth) of Present Population until 1998. The changes to birth registrations introduced by a new law had as a consequence the interruption of the birth survey, causing the loss of all the information on births, parents and the delivery. In order to fill the lack of information, new strategies for collecting data have been adopted by Istat. An integrated system of surveys is actually being created. It will permit not only to gather the information lost due to the suppression of the previous survey, but to considerably widen the relevant information for the comprehension of phenomena related to births and more general to perinatal health.  

This paper aims at providing a general overview of the new surveys system and the new opportunity offered for a current monitoring of perinatal events trends in Italy. The main indicators recommended by the PERISTAT project will be calculated. We discuss about some of the actual limitations in measuring specific aspects of perinatal health (such as perinatal and infant mortality); we finally indicate what strategies could be adopted to meet the goal of better statistics.

6. **Gwyneth Thomas**  
   Health Statistics and Analysis Unit, Welsh Assembly Government – Cardiff, Wales  
   
   *New Sources of Data on Perinatal Health for Wales*

New work is helping Wales start to fill some gaps in provision of PERISTAT data. The National Community Child Health Database (NCCHD) is a database of anonymised records for Welsh children. It contains key data items not available elsewhere such as gestational age, breastfeeding at birth and APGAR scores. It has become a key source of data for work in monitoring perinatal deaths and immunisation coverage. It is being used to inform public health work including analyses of early childhood surveillance, and maternal age and birth weight. NCCHD has the potential, once the challenges of data completeness and standard definitions are resolved, to be linked more fully with
other databases such as births, deaths and hospital data providing the opportunity to relate perinatal health with later health outcomes.

Other innovative datasets such as the Normal Births Care Pathways (providing data on the labour and delivery profiles of births placed on the pathway), antenatal screening and newborn hearing screening are being developed. The future challenge is to bring together and maximise the usefulness of these sources to provide an evidence base for policy development and to monitor the health of mothers and children in Wales.

7. Frantisek Bauer, Gabriela Magyarova
Clinic of Neonatology - Nove Zamky, Slovakia

Use of Analysis of Perinatal Mortality in the Formation of Interventional Strategies in Slovakia and their Implementation to Praxis

Objectives: Evaluation of interventional strategies impact to perinatal mortality in Slovak Neonatology and Perinatology, based on the results of analysis of perinatal mortality.

Methods: National analysis of perinatal mortality and morbidity takes place in Slovakia annually. Results are evaluated and compared with previous results among various regions, states and years. The most common etiology of the newborn death is identified, and the priorities are determined. A working group prepares interventional strategies, which are presented at national conferences, on the web, and by Ministry of Health. The priorities are published in the professional medical journals and distributed to all departments. In our study we present the impact of interventional strategies to clinical praxis.

Results: VLBW infants: the main strategy in this group was related to centralization. Increasing centralization of perinatal centers from 29% in the year 2000 to 75% in the year 2004 brought decreasing of mortality by 22%. Perinatal asphyxia: After the implementation of the Resuscitation and Stabilization Project in Slovak Neonatology, the rate of mortality for asphyxia decreased from 17,8% (in 2002) to 13,5% (in 2003). The specific neonatal mortality in group 1500-1999g was three times higher than in Czech Republic (21,4‰ in SR : 6‰ in CR) due to high mortality for early infection, and decreasing (from 21,4‰ in 2003 to 14‰ in 2004) after implementation of guidelines for PROM and IAP in GBS colonised mothers and guidelines for their newborns.

Conclusions: Interventional strategies were correctly realized in group VLBWI and perinatal asphyxia. Further improvement is possible through greater centralization and technological innovation. The interventional strategy for the group 1500 – 1999g was concerned with prevention and treatment of I.U. and early infections, and with support of centralization.

8. Hermien de Walle
EUROCAT Folic Acid Working Group, Universitair Medisch Centrum Groningen – Groningen, Netherlands

Monitoring policy implementation - Prevention of Neural Tube defects by Periconceptional Folic Acid Supplementation in Europe

4500 pregnancies every year in Europe result in a livebirth, stillbirth or termination of pregnancy of a baby/fetus affected by Neural Tube Defects (NTD), mainly anencephaly and spina bifida. Periconceptional folic acid supplementation (PFAS) had been shown by 1991 to be an effective method
of preventing potentially two thirds of cases. EUROCAT is a network of population-based registries for the epidemiological surveillance of congenital anomalies in 20 countries, covering nearly 30% of births in the European Union.

One area of focus in surveillance has been to track progress toward primary prevention of NTD. In early 2005, EUROCAT conducted a survey in 18 countries of policy concerning PFAS. Eleven countries had introduced a government policy advising PFAS, but these policies had not resulted in high rates of supplementation among women planning a pregnancy. Analysis of rates of NTD (including live births, stillbirths and terminations of pregnancy) showed no clear decline from 1992 to 2002 across Europe and thus extremely disappointing progress toward primary prevention.

Dissemination of these results collated at European level aims to inform national decision-making regarding the introduction of mandatory folic acid fortification of food.

Reference: www.eurocat.ulster.ac.u/pubdat/Folic-Acid.html

Institute of Quality Insurance - Hesse, Germany

The Use of Quality-Indicators to Advance the Quality of Perinatal Health Care

The Perinatal-Survey is one of the earliest methods in external Quality Assurance in Germany. It started 1975 in Bavaria (Munich Perinatal Study) and spread over the whole country within a few years. Since 2001 the BQS (Bundesgeschäftsstelle Qualitätssicherung gGmbH) is responsible for methods and coordination of the Quality Assurance in obstetrics in Germany.

The dataset contains information on the pre-, peri- and postpartum phase. Based on nearly 700 000 records of births per year a set of indicators to measure the quality is defined. The statistics of the Perinatal Survey within the quality-indicators are sent to the participating hospitals by the federal organisations (Landesgeschäftsstellen). If a hospital exceeds the reference value of a quality-indicator, the federal organisation contacts the hospital and induces a “structured dialog”.

In this presentation the usage of quality indicators and the procedure of the “structured dialog” will be demonstrated in the federal state of Hesse.

10. Jan Nijhuis1 and Simone Buitendijk2
1 Department of OB/Gyn, Academic Hospital Maastricht, the Netherlands
2 Division of Child Health, TNO Quality of Life, Leiden, the Netherlands

PERISTAT: Did it influence Dutch policy and Dutch Obstetrics?

In the Netherlands, registration of perinatal data is not a simple issue. In this country with 30% home deliveries by midwives and general practitioners, 70% hospital deliveries and many referrals and subsequent transports during labour from home to hospital, a unique register is not present. We have registrations by GPs (LVR-h), by midwives (LVR 1), by obstetricians (LVR 2) and paediatricians (LNR). Linking of these data is difficult at present, for there are many privacy rules. A unique number for each pregnancy/child does not yet exist. The CBS (Central Bureau of Statistics) runs a separate registry that contains some perinatal data. As early as 2001, the RIVM (State Institute for Public Health) on the basis of these data presented a report “A healthy start?” in which they observed a decreasing trend in perinatal mortality in all countries of the European Union. However,
this decrease levelled off in the Netherlands in particular, resulting in an unfavourable ranking. At that time the issue received little attention.

Around the same time the Dutch Health Council recommended the implementation of serum screening for Down’s Syndrome and neural tube defects (Nuchal measurements, serum screening in the first trimester, and routine ultrasonographic examination at 18-20 weeks). The Ministry of Health has been reluctant to implement the screening. At the same time, the Dutch Society of Obstetrics and Gynaecology (NVOG), the Royal Society of midwives (KN OV), the Dutch organisation of general practitioners (LHV), and the society of paediatricians (NVK) initiated the “Stichting Perinatale Registratie Nederland” (SPRN). SPRN is a foundation that aims to realize a complete and reliable perinatal registry in the Netherlands. For this project as for prenatal screening, funding was a difficult issue. In fact, no extra money was made available for screening or for the SPRN.

The SPRN decided to choose an active approach when the PERISTAT data were to be published in the European Journal of Obstetrics and Gynecology, and not wait till the press “found out”. A press release was scheduled and Buitendijk en Nijhuis acted as spokespersons, preparing consistent answers to press questions. Perinatal Mortality became the number one issue in the Dutch press and on radio and television as well. The Minister of Health first tried to deny the data, but the results were similar to the RIVM report. Coincidentally, prenatal screening was discussed in the Parliament, during the same week. The SPRN also talked with members of parliament and the KNOV, NVOG, LHV and NVK speaking with “one voice”. The Minister of Health then asked for a second analysis by another group and their results were even worse. The RIVM was asked to look into the problem and released a report “Measuring up to the best: International differences in perinatal mortality”, in which they concluded that “Dutch perinatal mortality is declining, but still higher than in Finland and Sweden” (they did not look at other countries in the European Union, so there was no new ranking).

As a final step, some money became available for a perinatal audit pilot in the Netherlands, which showed that substandard care was quite common in cases with perinatal mortality.

Presently, perinatal mortality and its analysis, as well as screening, is high on the political agenda. Screening (nuchal translucency, serum and 2nd trimester ultrasound) is being introduced now, and money became available for the continuation of the SPRN. A unique perinatal registry is being developed, and we hope that money will become available to start perinatal audit on a yearly basis.

Finally, PERISTAT developments are closely followed: professionals and politicians are extremely interested in the results of PERISTAT II.
SESSION A  Perinatal health information systems & indicators

11. Inese Birzule

Maternal & Child Health Statistics Unit, Health Statistics & Medical Technologies State Agency – Riga, Latvia

Perinatal Health Statistics Data Quality in Latvia

The Newborns State Register (NSR), Death Causes Data Base (DCDB) and health statistics are under jurisdiction of Health Statistics and Medical Technologies State Agency (Agency), Health Statistics Department (Department). Every register is maintained and updated by certain Department’s unit.

Most PERISTAT indicators can be obtained from NSR, which contains data as from 1997. The Newborns Register Card is a unified document. All diagnoses (both maternal and newborns) are coded by ICD-10. The functioning of NSR is based on cooperation between maternity wards and NSR. Head of NSR supervises and checks the data.

Perinatal, newborn’s and maternal mortality data come from DCDB. The Certificate of Death is a unified and internationally comparable document. Physicians code data by ICD-10. In Latvia there are about 200 perinatal death cases per year. Every case is compared to NSR data.

Every year the Agency receives and summarises maternal and child health statistics data from all healthcare institutions of Latvia. These data are compared to NSR. Information is adjusted if necessary. All terms and definitions used for evaluation of perinatal health and calculation of indicators are based on WHO definitions and recommendations.

In conclusion, perinatal health statistics data of Latvia are complete, valid and internationally comparable.

12. Béatrice Blondel

Institut national de la santé et de la recherche médicale (INSERM) U149 – Villejuif, France

The French Perinatal Surveys: a method for collecting routine data and data for special topics

The objective of the surveys is to monitor trends in the main indicators of health, medical practice and risk factors and to provide information about the needs of the population or the application of perinatal health policies. The survey collects a minimum data set on and adds specific topics of interest in individual years. All births during a short period of time.
The survey is carried out during one full week. All live births and stillbirths occurring during this period in medical settings are recorded. The sample included 14,700 newborns in the last survey in 2003. Data are derived from two sources. Data concerning socio-demographic characteristics of the parents, obstetrical history, tobacco consumption, and prenatal care are obtained by interviewing the mother during her stay in hospital after delivery. Characteristics of the delivery and health status of the newborn are obtained from the hospital records.

This type of survey may be useful in countries that have a relatively well-developed health care system, but few sources of reliable population-based statistics on health and medical care. It was successfully applied in Lebanon in 1999. This type of survey may also be an appropriate instrument for collecting additional data for health policy evaluations.

Emanuele Ciotti, Francesca Bravi, Elena Prati, Sara Princivalle, Manuela Panico, Elisa Stivanello, Francesca Vitali, Giacomo Faldella, Elena Savoia, Maria Pia Fantini

1 Department of Public Health Alma Mater Studiorum, University of Bologna, Bologna Italy
2 Dept. of Preventive Paediatrics & Neonatology, Alma Mater Studiorum, University of Bologna
3 Harvard School of Public Health, Boston USA

Postpartum Depression: Measurement issues and research on the determinants of EPDS scores.

Introduction: Postpartum depression (PPD) is a traumatic event with lasting effects on a mother’s self-confidence, and on her infant’s emotional and cognitive development. The debate on the recognition of PPD as a public health problem is on-going, and requires the identification of valid assessment tools for population screenings. The main objective of this study was to assess the validity and reliability of the Edinburg Postpartum Depression Scale (EPDS) in an Italian sample, and to evaluate its feasibility as a screening tool.

Methods: We conducted a literature review to identify valid PPD measurement tools. A longitudinal study was conducted on 651 mothers delivering their babies at the S. Orsola-Malpighi Hospital of Bologna. Factor analysis was performed to test the construct validity. Cronbach’s alpha values were computed to assess reliability. Variables related to the mother’s and her partner’s life were investigated as determinants of EPDS scores.

Results: The literature review lead to the identification of the EPDS as the best screening tool available to detect PPD. The Italian version of the EPDS resulted to be a valid and reliable instrument. The factor analysis identified two components explaining > 60% of the variance. Low educational level was related to the EPDS score.

Maria Pia Fantini, Brunella Frammartino, Laura Dallolio, Rino Bellocco, Paolo Cacciari
Danilo Fusco, Carlo Alberto Perucci

1 Dipartimento di Medicina e Sanità Pubblica, Alma Mater Studiorum Università di Bologna
2 Dipartimento di Statistica, Università degli Studi di Milano - Bicocca
3 Department of Biostatistics and Epidemiology, Karolinska Institutet
4 Azienda Ospedaliera-universitaria S.Orsola - Malpighi, Bologna
5 Dipartimento di Epidemiologia ASL RME

Cesarean Delivery Indicators: a study of reliability among different methods for detection of c-section proportion
**Objective:** To assess the reliability of five indicators for caesarean delivery derived from two different administrative databases and to evaluate their influence on hospital ranking.

**Methods:** Two different databases were taken into account to identify the study population: 1) Maternal hospital discharge records (2003-2004) selected using three different sources of information: DRG (370-375), procedure codes (ICD-IX:72-74) and diagnosis codes (ICD-9-CM: 640.xy-676.xy, y=1,2; V27) to identify deliveries; and 2) Birth Certificates (2003-2004).

Five different caesarean delivery indicators were calculated; four from the hospital discharge records, using different combinations among DRG, procedure and diagnosis codes that identified caesarean delivery and one from the Birth Certificates.

The agreement and the correlation between cesarean proportions obtained by different indicators and hospitals ranking were assessed by Spearman and Kappa coefficients.

**Results:** The linkage between the two databases identified a cohort of 67,557 deliveries. The five indicators identified a proportion of caesarean delivery ranging from 30.92% to 30.96%. The ranking analysis showed a high reliability among different methods for detection of c-section rates: Spearman correlation ranged from 0.95 to 0.99 and Kappa coefficient from 0.40 to 0.99.

**Conclusion:** Our results show that different informative sources are comparable as far as c-section proportions are concerned and hospital ranking is not affected by different indicators.

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15. Cristiano Marini¹, Silvia Buzzone², Monica Pace², Sabrina Prati², Viviana Egidi³, Marina Cuttini¹

¹Unit of Epidemiology, Ospedale Pediatrico Bambino Gesù, Rome, Italy
²Istat, National Statistical Institute
³University of Rome “La Sapienza”

**Neonatal Mortality by Prognostic Factors: an exercise in birth-death data linkage for the Lazio region in Italy**

According to the current perinatal registration system, in Italy, calculation of birth weight and gestational age-specific neonatal and infant mortality rates requires the matching of the birth and infant death certificates data-bases.

Since 1999, after the Privacy Law adoption, in fact, infant mortality data have been collected due to confidentiality reasons without some crucial information. The data-linkage between the mentioned sources allows the improvement of causes of death data quality with respect to the correct choice of the underlying cause of death.

However, birth data are transferred from the Italian Health Ministry to the National Institute of Statistics (Istat) without personal identifiers (names and personal code number), thus making individual linkage with the Istat infant death certificate quite problematic.

This study reports the results of a trial of data-linkage carried out on the 2003 birth cohort of the Lazio region, where about 9% of total Italian live births and 11% of total infant deaths have occurred. Date and place of birth of the child, and date of birth and residence of the mother are utilized for the linkage. This exercise represents an example of an integrated use of the perinatal statistics which could be generalized to the whole country.

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This study reports the results of a trial of data-linkage carried out on the 2002 birth cohort of the Lazio region, where 9.2% of total Italian live births and 10.5% of total infant deaths have occurred. Date and place of birth of the child, and date of birth and residence of the mother are utilized for the linkage. This exercise represents an example of an integrated use of the perinatal statistics which could be generalized to the whole country.

16. Kath Moser¹, Lisa Hilder², Nirupa Dattani¹

¹Child Health team, Office for National Statistics, London
²Department of Midwifery, City University, London

Improving Information About Births in England and Wales.

Background: In England and Wales, infant death and birth registration data have been linked since 1975. Gestational age at live birth is not collected by Registrars, reducing the value of these data for local use and international comparisons, such as those for Peristat. Since 2002, gestational age has been recorded when allocating National Health Service (NHS) Numbers to newborn babies. A research project is linking these data with birth registration data from January 2005. Some data items (e.g. mother's age, birthweight) are recorded in both systems, others (e.g. ethnicity, parental occupation) in one system only. These similarities and differences can be exploited to validate and extend information about births.

Aims: To test the quality of NHS Number notification data against birth registrations by linking records for births in the first quarter of 2005; to demonstrate the added value obtained by combining these data sources.

Results: There were 155126 NHS Number notification records and 155034 registration records for births occurring in this period. To date linkage has been achieved for 99.8% of these. Tabulations of findings will be presented.

Conclusions: The value of the combined information from both systems far exceeds that obtained from either system in isolation.

17. Rhonda Small

School of Public Health, La Trobe University - Melbourne, Australia

Adding Migration Indicators to Routine Perinatal Data Collections: a proposal from Australia

Despite considerable ethnic and cultural diversity in Australia, birth outcomes for immigrant and refugee women have been described in just a few, fragmented studies. Marked variation in outcomes by maternal country of birth occurs (e.g. in obstetric interventions, mode of birth), but the reasons remain unclear. Is such variation explained by social and obstetric differences between immigrant/refugee women and Australian-born women or by a more subtle interplay of non-medical
and contextual factors, such as communication difficulties or refugee background? Further investigation of these issues is hampered by the lack of any routinely collected data at birth on relevant migration indicators.

This poster presentation will describe an approach to addressing this problem in the state of Victoria, where there is provision for ‘occasional data’ items to be added to the routine perinatal form completed for all births. Questions about English fluency, length of residence in Australia and migration category (refugee, family reunion, skilled migration) could be added as occasional data items for a specified period. Progress with this proposal to date, including outcomes of discussions on the feasibility and acceptability - to hospital staff and women - of asking such questions, will be outlined.

SESSION B  Analyzing data from routine sources to evaluate practices and outcomes

18. Stefania Arniani¹, Veronica Casotto¹, Irene Volpi¹, Franca Rusconi² and Eva Buiatti¹

¹Unit of Epidemiology, Regional Health Agency of Tuscany – Florence, Italy
²Unit of Epidemiology, Meyer University Hospital for Children – Florence, Italy

Lifestyles During Pregnancy: BMI and smoking

The Region Tuscany has included new variables in its delivery assistance database: height, pregravidic weight, smoking during pregnancy. A total of 72.8% of women delivering in Tuscany in 2004 have turned out to be normal BMI, 8% underweight, 14.8% overweight and 4.4% obese. There are overweight and obese women among those with a middle-low education, and among housewives.

Almost 1 woman out of 10 smoke during pregnancy: 3.9% smoke just one to three cigarettes a day, 4.1% 4 to 10, and 1.5% more than 10. In particular, it has come out that especially minors, scarcely educated, unemployed, and Italian women smoke during pregnancy.

A multivariate analysis, adjusted by social and population features, shows that underweight women have a higher risk to have lower weight babies (OR 1.6; 95% C.I. 1.4-1.9); obese women have a higher risk to have premature babies (OR 1.6; 95% C.I. 1.3-1.8); smoking during pregnancy increases the risk of having premature and lower weight babies. This latter risk in particular increases as the number of cigarettes smoked increase (between 1 and 10 cigarettes a day: OR 1.7; 95% C.I. 1.7-2.0; more than 10 cigarettes a day: OR 3.7; 95% C.I. 2.8-4.8).

Since BMI and smoking during pregnancy are associated to life styles, the availability of this information in delivery assistance database is a very important condition to be able to monitor their progress, and to spread them at a population level, aiming at a more effective and timely planning of guidance campaigns and primary prevention interventions.

19. Maria Pia Fantini¹, Elisa Stivanello¹, Brunella Frammartino¹, Danilo Fusco², Laura Dallolio¹, Paolo Cacciari³ Carlo Alberto Perucci²

¹Department of Medicine and Public Health, University of Bologna, Bologna, Italy
²Department of Epidemiology, ASL ROMA E
³Azienda Ospedaliera – University of Bologna, S.Orsola - Malpighi General Hospital, Bologna, Italy

Risk adjustment for interhospital comparison of cesarean section rates
Context: Caesarean section (c-section) rates are one of the most frequently used quality indicators of obstetrical departments.

Objectives: To assess whether the adjustment for clinical and socio-demographic variables of the mother and the foetus is necessary for inter-hospital comparisons of c-section

Methods: Discharge abstracts of labouring women without prior cesarean were linked with abstracts of newborns dismissed from 29 hospitals of Emilia-Romagna (Italy) from 2003 to 2004. Risk factors were selected by using backward procedures and adjusted OR of cesarean by hospital were estimated applying a logistic regression model. Hospital rankings, based on crude and adjusted ORs were examined.

Results: 25 variables were selected (maternal age, citizenship, residency, civil status, hypertension, diabetes, lung diseases, HIV, other severe co-morbidities, multiple births, abruptio placentae/placenta previa, eclampsia/pre-eclampsia, polyhydramnios, oligohydramnios, cord prolapse, premature rupture of membranes, intrauterine grow retardation, Malposition/malpresentation, foetopelvic disproportion, postterm delivery, foetal abnormalities, infant weight, foetal distress, congenital malformation, assisted fecundation). After adjustment 21 units changed their rank: two moved 1 position, seven moved 2-3, ten moved 4-10, and two more than 10. Adjusted OR were greater than crude.

Conclusions: Risk adjustment is necessary to compare hospital c-section rates, it shows differences in rankings and highlights inappropriateness of some hospitals.

20. Steve Jarvis, Svetlana V. Glinianaia
Institute of Child Health, University of Newcastle on Tyne – Newcastle, England

Fetal Versus Neonatal Growth Standards for the Analysis of Perinatal Outcomes by Size at Birth

Relative size of babies may be judged by reference to appropriate standards of expected birth weight for gestational age. However, conventional (i.e. Birth weight-based) neonatal growth standards are biased by the inclusion of preterm babies that are abnormally small for gestational age. Examples will be given comparing the use of neonatal and fetal (estimated fetal weight) growth standards in the interpretation of European cerebral palsy (SCPE) data.

It is proposed that future analyses of perinatal morbidity and mortality by relative size at birth should use fetal growth standards. These can be generated by retrograde extrapolation from local mean term birth weight (39/40 wks) by gender, parity, period etc using separate trajectories of intrauterine weight changes during normal gestation for singletons and twins.

21. Martin Langer¹, G. Steiner², M. Tiefenthaler², S. Adamek¹
Departments of Obstetrics¹ and of Neonatal Intensive Care², University of Vienna, Austria

Perinatal Results After In-Utero-Transfer: impact of psychotherapeutic counseling

Pregnant women after in-utero-transfer remain at high-risk for medical and psychological complications. We therefore initiated a psychotherapeutic counselling, that was aimed towards reduction of fear and improvement of communication between patients and staff.
Women were randomised either to additional counselling or to standard medical care. As psychometric tests we used the Freiburg Coping-with-Illness Questionnaire, the STAI-X inventory, and the Parental Stress Scale.

108 women were recruited, 60 of them received counselling, 48 did not. Mean gestational age at transfer was 27.2 weeks, at birth 29.1 weeks, mean birth weight 1.120 grams. Mode of delivery was c-section in 81%.

Women after counselling were dismissed pregnant more often (34% vs. 25%) and their children were admitted to NICU at a lower rate (60% vs. 75%). They scored lower in anxiety measures and applied different and more appropriate coping strategies. Parental stress was equal in both groups.

We conclude that psychotherapeutic counselling is effective in a high risk population, both for medical and for psychological parameters, in terms of reduction of state anxiety and in improving coping mechanisms.

Marianne Mead
School of Nursing & Midwifery, University of Hertfordshire, UK

Perception of intrapartum risk and midwives’ practice and culture in UK, Belgium and France

Background: A previous UK study of midwives’ perception of risk identified that midwives working in higher intervention units had a slightly higher perception of intrapartum risk for healthy nulliparae in spontaneous labour than midwives working in lower intrapartum intervention risk. Midwifery and obstetric practices vary between regions, but also between countries. Invitations to take part in midwifery conferences enabled the extension of this study to midwives’ activities and perception of intrapartum risk in Belgium (Flanders only) and in France (north east). The study is presently being organised for the Nordic countries, but their results will not be available until 2007.

Method: A shorter version of the closed questions questionnaire used for the UK study was translated in Dutch and French, and distributed to midwives invited to their annual meetings by their association in Belgium, and via an organising school of the north east of France. The study is now completed in Belgium, but will only be completed in the beginning of 2006 for the French midwives.

Results: Not yet available for France. In Belgium, midwives generally followed a strong medicalised model of care, with students reporting doing so more than midwives. However, as in the UK, the respondents overestimated the likelihood of potential problems, such as breech or transverse presentations, fetal hypoxia. The proportion of emergency caesarean sections was estimated at 12-15% in the UK, and only 5-8% in Belgium. French results will follow and be ready for June 2006.

Discussion and Conclusion (to be finalised once the French results have been analysed): The practice of midwives in Belgium and France varies significantly from the UK and maternity care is generally more medicalised, with a much greater proportion of private care. However, despite a higher rate of obstetricians, increased privatisation and a more technological approach to pregnancy and delivery care, the overall caesarean section rates are lower in both countries than in the UK.

Statement that results will be presented at the conference: The questionnaires from the French survey are beginning to come in and the deadline for returns has been put at January 2006. The analysis will be completed for May 2006 when only the French results will be presented at the annual French midwives conference in Strasbourg.
23. **Patrick Rozenberg, Laurence Bussières, Sylvie Chevret, Lydia Malagrida, Howard Cuckle, Chantal Chabry, Jean Philippe Bault, Philippe Boukobza, Yves Giudicelli, Yves Ville**

Versailles-St Quentin University and Department of Obstetrics & Gynecology, Poissy-Saint Germain Hospital, Poissy, France

*Assessment of the Performance of First Trimester Combined Screening Followed by Routine Second Trimester Ultrasound Examination for Down Syndrome Screening*

**Objective:** To assess the performance of first trimester combined screening followed by routine second trimester ultrasound examination for Down Syndrome screening.

**Study design:** We carried out a multi-centre, interventional study in the unselected population of a single health authority. Detection and screen positive rates were estimated using a correction method for non verified issues. A cost analysis was also performed.

**Results:** During the study period, 14,934 women were included. Fifty one cases of Down Syndrome were observed, giving a prevalence of 3.4 per 1000 pregnancies. Of these, 46 were diagnosed through first (n=41) or second (n=5) trimester screening. Among the 5 screen-negative Down syndrome cases, all were diagnosed postnatally after an uneventful pregnancy. Detection and screen positive rates of first trimester combined screening were 79.6% and 2.7%, respectively. These features reached 89.7%, and 4.2%, respectively when combined with second trimester ultrasound screening. The average cost of the full screening procedure was 108 € (120$) per woman and the cost per diagnosed Down syndrome pregnancy was 7,118 € (7,909 $).

**Conclusion:** Our findings suggest that one pragmatic interventional two-step approach using first-trimester combined screening followed by second trimester detailed ultrasound examination is a suitable and acceptable option for Down syndrome screening in pregnancy.

24. **Stephan Schmidt, G. Heller, Björn Misselwitz and Wolfgang Künzel**

Department of Obstetrics and Perinatology, University of Marburg, Germany

*Use of Perinatal-data to Demonstrate Differences in Perinatal Care*

The Perinatal Survey Hesse (HEPE) is a method for quality assurance of obstetrical units in the German federal state of Hesse which was started more than 20 years ago and meanwhile covers over 1 million births.

Using this Survey we had previously demonstrated an increased early neonatal mortality rate in low risk babies born at night (OR = 1.76) and in small birthing units (OR = 3.48, <=500 births/year vs. >1500 births/year). We had speculated that the observed mortality gradients may relate to the lower staffing and readiness inherent in low volume birthing hospitals. Additionally, we performed a unit survey to obtain a detailed description of the structural, apporative and staffing situation within delivery units. Thus, following these analyses, we consented a paper recommending minimal requirements for birthing units.

Data from the Perinatal Survey Hesse are useful to demonstrate correlations between structural parameters of birthing units and the outcome of newborns.
Singletons and Twins After Sub-fertility Treatment: the case of Slovenia

**Background:** The multifetal pregnancy rate has been on the increase in the last decades due to subfertility treatment. This also happened in Slovenia and there have been few studies that investigated the outcome in medically conceived babies. The aim of our study was to investigate the differences in gestational age in medically and naturally conceived singletons and twins in Slovenia in the period from 1989 to 2005.

**Methods:** All births reported to the Perinatal Information System of Slovenia from 1989 to 2003 (290,648 births) were studied. Gestational length and prevalence of preterm birth were analysed in singletons and twins with respect to sub-fertility treatment. Time trends were analysed and three-year periods were compared.

**Results:** Between 1989 to 2003 the proportion of deliveries of twins increased from 1.0% to 1.8%. Altogether 3836 pairs of twins were delivered (3067 (80.0%) naturally conceived, 57 (1.5%) ovarian stimulation, 63 (1.6%) artificial insemination, 649 (16.9%) in vitro fertilization). In singletons, 283542 (98.9%) of babies were naturally conceived, 654 (0.2%) were born after ovarian stimulation, 371 (0.1%) after artificial insemination and 2138 (0.8%) after in vitro fertilization. In naturally conceived twins the proportion of pre-term deliveries was 49.2%, and in twins born after subfertility treatment 61.8%. Comparing gestational age at birth the mean difference in days was 6 days. In naturally conceived singletons the proportion of pre-term deliveries was 5.3%, and in singletons born after subfertility treatment 11.4%. Comparing gestational age at birth the mean difference in days was 4 days.

**Conclusions:** The proportion of multiple gestations has been on the increase due to more use of subfertility treatment as well as the increase of the maternal age in the study period. Twin as well as singleton pregnancy resulting from subfertility treatment had an increased risk of preterm delivery. Our study reported lower proportion of medically conceived twins than other studies and this is probably due to incomplete data in the Perinatal Information System of Slovenia.

**SESSION C  Assessing Geographic and Social Inequalities**

26. **Maria Pia Fantini**, **Elisa Stivanello**, **Francesca Bravi**, **Sara Princivalle**, **Laura Dallolio**, **Cinzia Marano**

1Department of Medicine and Public Health, University of Bologna - Bologna, Italy
2Institute of Hygiene, Catholic University, Rome / National Observatory on Health in the Italian Regions, Catholic University – Rome, Italy

**Aim:** to assess temporal and geographical trends of infant, neonatal and post-neonatal mortality rates in the Italian Regions.

**Methods:** data on neonatal and infant deaths and deliveries were available in an aggregated form by Region from 1990 to 2001. We calculated three years moving averages, average annual percent change and we also analyzed time trends using a negative binomial regression model.
Results: In 2000-2002 the infant mortality rate (IMR) in Italy was 4.2 per 1000 live births, the neonatal mortality rate 3.1 and the post-neonatal mortality rate 1.1. During the twelve year period the mean annual diminution of the IMR was equal to 5.8%. All regions registered a reduction of both neonatal and post-neonatal mortality. This decline was statistically significant (p<0.05) in all regions however the North/South ratio remained unchanged with Southern Regions rates more than two times (2.3 and 2.6 for IMR and neonatal mortality respectively) Northern regions rates.

Conclusions: There remains a significant challenge for public health and health care workers in the years ahead to reduce infant and neonatal mortality in the Italian Regions where the highest rates are registered and to eliminate geographical disparities.

27. **Robyn Gabel¹, Leo Smith²**  
¹ Illinois Maternal and Child Health Coalition, Chicago, Illinois USA  
² Birth to Three, Chicago, Illinois USA

The Use of Data to Increase Funding for the Reduction of Prematurity

The percentage of babies born at low birth weight is increasing in the state of Illinois, and funding is needed to institute new programs to address the problem. The medical costs for a baby born of low birth weight are astronomical and funding programs to reduce prematurity could save costs.

We analyzed medical expenditures for delivery and newborn care from Medicaid, the state health insurance program for low-income families. Expenditures were analyzed for the state as a whole and for also for specific geographic areas. The results were transferred to a map of Illinois and shared with policy makers who were able to observe that Medicaid costs were very high for babies born prematurely and that the costs were focused in a few geographic areas.

As expected, Medicaid costs for a baby born prematurely were 20 times the cost of a normal delivery. Areas of the state that are highly urban or highly rural had the highest percentage of premature babies.

As a result of this data analysis, including the highly visual map, legislators allocated new funds to reduce prematurity in select communities.

28. **Kotryna Kuodytė, Aldona Gaižauskienė**

Lithuanian Health Information Center – Vilnius, Lithuania

The Changes of Risk Factors of Perinatal Mortality in Lithuania

Background: Since 1992 perinatal mortality in Lithuania has been on the decrease. In 2004 it reached the level 8.3 deaths per 1000 births. A study based on Medical Birth Register in Lithuania showed that in 1997-1998 the highest odds ratio (OR) and population attributable risk fraction (PARF) were related to factors associated with obstetric aid during delivery and pathology of current pregnancy.

Aim: The aim of this study was to compare changes of the impact of risk factors on perinatal mortality for the two time periods (1997-1998 and 2003-2004).

Material and methods: The Medical Birth Register Database covering social - demographic factors, the obstetric anamnesis of previous pregnancies, as well as mother’s health behavior and pathology of the current pregnancy, delivery and obstetric aid was used for the study. The multivariate analysis assessing odds ratios of risk factors for perinatal mortality using logistic regression was carried out and related population attributable risk fractions were calculated.
Results: 19 statistically significant factors (p<0.001) out of 76 were selected for comparing two time periods. The highest OR and PARF were found for the factors related to clinical pathology during the pregnancy. The septic state of mother during the delivery (OR=13.3; CI=8.9 – 19.9) and haemorrhage due to a premature placental separation (OR=11.6; CI=7.9 – 16.9) were associated with substantial increased risks of the foetus in 1997-1998, thus in year 2003-2004 the odds ratio of these factors changed (OR=6.8; CI=3.7 – 12.7 and OR=19; CI=12.3 – 29.6 respectively). The influence of intrauterine foetal version increased in 2003-2004 (OR=16.8; CI=6.1 – 46.4) comparing with 1997-1998 (OR=6.6; CI=3.1 – 13.8). Factors from the other groups (perinatal pathology during previous pregnancies and social, behavior or environmental factors) had somewhat lower, though significant, risk on perinatal mortality. The highest PARF was found for breach birth in 1997 – 1998 (PARF=13 percent), in 2003-2004 it increased (PARF=14.7 percent). It should be pointed out that the impact of marital status on perinatal mortality was very high in 1997-1998 (PARF=6.6 percent), but in 2003-2004 it increased significantly (PARF=14.4 percent), though its odds ratio was among the lowest (OR=1.5; CI=1.2 – 1.7 in 1997-1998 and OR=1.6; CI=1.3 – 1.9 in 2003-2004).

Conclusion: The changes of the impact of factors related to clinical pathology were not profound whereas the impact of marital status increased significantly. These results show the importance of strengthening family policy in Lithuania.

29. Alison Macfarlane1 and Joanne Maher2

1 Department of Midwifery, City University
2 Formerly of the Office for National Statistics

Trends in Inequalities in the Outcome of Pregnancy and Associated Socio-demographic Factors in England and Wales

Background
In response to the setting of a target to reduce inequalities infant mortality, this project aimed to investigate long-term trends and associated factors.

Methods
Using data from registration of births and deaths, numbers of live births occurring each year from 1976 in England and Wales to 2000 and infant deaths among each year's births were analysed by mother’s age, father’s social class, parents' marital status at registration, numbers of babies born and babies’ birthweights. Analyses involving birthweight started in 1983, as data for previous years were incomplete.

Results
On average, mothers with partners in non-manual occupations were older than those with partners in manual occupations, but mothers’ ages increased from 1976 to 2000 in both groups. Among singleton births, the proportion of low weight births increased for mothers in their twenties but remained relatively constant for older mothers. The proportion of mothers with partners in non-manual occupations rose while the proportion in non-manual occupations fell. Neonatal mortality fell to a much larger extent than postneonatal mortality and social class differences in postneonatal mortality were persistently wider. For singleton babies, differences in infant mortality were much wider than among babies weighing 1,500-2,499g.

Conclusions
Account should be taken of changes in the socio-demographic composition of live births when interpreting trends in inequalities in infant mortality.
30. **Guy Martens, Hendrik Cammu**  
Institution: Studiecentrum voor Perinatale Epidemiologie (SPE) – Brussels, Belgium

**Social Inequalities in Perinatal Outcome in Flanders**

This study is derived from the perinatal data collected by the Study Centre of Perinatal Epidemiology in the Flanders, between 1999 and 2004. We linked the perinatal outcome of all deliveries (≥ 500 g) from mothers ≥ 20 years with socio-economic data (359,228 births).

Educational level (4 levels) is strongly related to fetal death ($\chi^2=226$) and to a lesser degree with the early-neonatal mortality ($\chi^2=41$). Employment (4 levels) is even more strongly related to fetal death ($\chi^2=168$) and to early-neonatal death ($\chi^2=36$). Professional skills (3 levels) correlated mainly with fetal mortality ($\chi^2=48$) and with the early-neonatal death ($\chi^2=10$).

Four levels of education were distinguished: (level 1) lower than 6 years, (level 2) 9 years, (level 3) 12 years, (level 4) 15 years or more.

The perinatal death was respectively 1.19% (level 1), 0.87% (level 2), 0.54% (level 3), 0.38% (level 4).

In conclusion, the educational level of the mother appears to be the most important determinant of perinatal death, especially fetal death in Flanders. Mothers with highest level of education experienced the lowest perinatal mortality rate.

31. **Waldemar Skawinski, Jerzy Janecki, Katarzyna Szamotulska**  
National Center for Health Information Systems – Warsaw, Poland

**Statistical Analysis of Health Inequalities in Poland Based on Routine Laboratory Tests and Selected Health Indicators**

Density estimation of probability distribution was applied to big sets of the routine medical laboratory data. During a systematic examination of 18 biochemical serum constituents the reduction of levels of protein metabolites were found what could be certified with lower albumin levels. The seasonal variation and systematic drop of the serum protein level was accompanied by the same changes of cholesterol level in the post-industrial region in the 1990 years. This phenomenon corresponded to the economic regression of this region and was correlated with deterioration of socio-economic and health indicators.

Recent studies have revealed the same conclusion when haemoglobin levels in young women from East Poland (rural region in general) are compared with women from a capital city. Dramatic differences concern the puberty period and the significant decrease of haemoglobin in the period of childbearing.

The presented original method may provide new health indicators that are sensitive for short-term and long-term socio-economic and environmental threats as well. The early detection and monitoring of health inequalities is of great value for patients, health professionals, local governments and health policy makers. This is the important and effective tool for performing the European action against the health exclusion.
32. **Alvi Tellmann**  
National Institute for Health Development - Tallinn, Estonia

*Socioeconomic Differences in Perinatal Mortality in Estonia*

The Estonian Medical Birth Registry data for the years 1992 to 2004 (n = 177,552 newborns) were used to study socioeconomic differences in perinatal mortality in Estonia. Perinatal mortality rate was estimated by maternal education, occupation, marital status and ethnic origin.

The study showed that socioeconomic differences in perinatal mortality exist. In 1992–2004 the average perinatal mortality rate in Estonia was 12.2/1000. The perinatal mortality rate was higher for Non-Estonian than Estonian mothers. It was higher for lone mothers than for cohabiting and married mothers. By maternal occupation, the perinatal mortality rate was the highest for unemployed and disabled mothers, followed by housewives, employed mothers and students. The perinatal mortality rate was inversely related to level of maternal education. During the period 1992–2004 perinatal mortality decreased in all socioeconomic groups, but differences remained. Differences in perinatal mortality by mother’s marital status and ethnic origin decreased, but increased by education and occupation.

33. **C. Vutuc, G. Haidinger, and T. Waldhoer**  
Department of Epidemiology, Center of Public health, Medical University of Vienna – Vienna, Austria

*Non-random Spatial Distribution of Infant Mortality in Austria 1984-2002*

The aim of this study is to describe the spatial distribution of infant mortality in Austria between 1984 and 2002, adjusted by important risk factors in a logistic regression model. Additionally, we focus on the calculation of a measure for explained variation which allows us to quantify the impact of the risk factors in the regression model in terms of predictive ability. We use 1,654,519 individual birth records from the Austrian birth register. 14 variables describing the infant and the mother and 4 ecological variables are included.

Our analysis shows that in the south eastern parts of Austria infant mortality is markedly lower than in the rest of Austria as well as non-randomly spatially distributed (p<0.001). The triple "gestational age, birthweight and birthlength" contributes by far the most in terms of predictive ability with a partial R-squared value of about 21%. All other variables show very low R-squared values including political district (R-squared=0.08%) which describes the non-random spatial distribution of infant mortality. The observed non-random spatial distribution is surprising because of the inclusion of many important risk factors in our model, and because quality of medical services is supposed to be equal throughout Austria especially for infants independently of social class and other factors.
EURO-PERISTAT II Project Summary

The aim of the EURO-PERISTAT II project is to complete the development of a strategy for monitoring and evaluating perinatal health in the European Union. Perinatal health indicators measure maternal, fetal and infant health during pregnancy, delivery and the postpartum period, as well as the health consequences of events that occur in the perinatal period. They also measure demographic, medical, social and health system factors that impact perinatal health.

Before the work of EURO-PERISTAT began, many perinatal health indicators in the EU countries could not be compared because of important differences in definitions, data collections procedures, birth and death registration, and medical practices. In addition, key indicators for evaluating perinatal health and the quality of health services were not available in all countries.

EURO-PERISTAT I was successful in identifying 10 core and 23 recommended indicators of perinatal health and the determinants of perinatal health, and in assessing the ability of existing data collection systems to construct these indicators. These are available for review at http://europeristat.aphp.fr. To complete the development of a comprehensive health information and knowledge system for evaluating and monitoring perinatal health in Europe, EURO-PERISTAT II will focus on four key objectives:

- **Integrate New Member States** by adapting the indicator list to their health context and assessing the feasibility of collecting these indicators
- **Establish New Indicators** to complete a comprehensive indicator set encompassing more fully the essential dimensions of perinatal health. These will include indicators of:
  1. Neonatal morbidity and longer-term impairments of perinatal origin
  2. Morbidity in women during pregnancy, delivery and the postpartum period
  3. Positive outcome of pregnancy
  4. Perinatal health in socially excluded groups
- **Develop Methods for Compiling High Quality Indicators** and collect data
- **Design a Reporting Methodology** to achieve best use of data for surveillance and evaluation of health outcomes, practices and policy

In addition to a project Steering Committee, EURO-PERISTAT II is supported by a **Scientific Committee** in which a single participant from each member state contributes scientific expertise and coordinates all project activities within their country. In addition, a **Scientific Advisory Group** enables participation from a larger group of scientific experts who collaborate to develop new indicators and methods for compiling and transmitting data.

EURO-PERISTAT II is part of the European Commission’s Public Health Programme, which aims to measure health status and determinants throughout the community in order to support health and social policy in the European institutions and member states.

**EURO-PERISTAT II Steering Committee:** J. Zeitlin and M. Zimbeck, Scientific Coordinators, U149 INSERM, Paris; G. Bréart, Project Leader, Assistance Publique-Hôpitaux de Paris; S. Alexander, Reproductive Health Unit, Université libre de Bruxelles, Brussels; H. Barros, Department of Hygiene and Epidemiology, Porto Medical School, Porto; M.H. Bouvier-Colle, U149 INSERM, Paris; I. Berbik, Hungarian Society of Obstetrics and Gynecology, Esztergom; B. Blondel, U149 INSERM, Villejuif; S. Buitendijk, Division of Child Health, TNO Institute Prevention and Health, Leiden; C. Cans, SCPE Registers, University Joseph Fourier, Grenoble; M. Gissler, National Research and Development Centre for Welfare and Health, STAKES, Helsinki; A. Macfarlane, Bartholomew School of Nursing and Midwifery, City University, London; Z. Novak Antolic, Department of Perinatology, University Medical Centre, Ljubljana.
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Practical Information

1. Hotel Beta Porto
Rua Do Amial, 607
Tel: +351 - 228 348 660
www.hotelbetaporto.com

The hotel is located outside of the city center but in close proximity to the congress site at Ordem dos Medicos. In the map below, the red arrow indicates the hotel location, just north of the red “interior ring” road that encloses the central city.

Located just a few minutes from the city centre with easy access to airport and beaches, the offers:

- Regional cooking Restaurant
- Bar
- Meeting Rooms
- Health Club
- Heated Interior Swimming Pool
- Hair Dresser
- Private Parking
- Wireless Lan Connection
- Room Service
- Laundry
- Car Rental
- Tours
- Show Tickets

Getting from the Airport to the Hotel Beta Porto

Taxi: A taxi ride is approximately 19 euros from the airport to the Hotel Beta Porto.
Shuttle Bus: The most inexpensive method is to take one of the shuttle busses that run between the airport and the city’s hotels. Between 7:30 in the morning and 19:00 at night, busses depart every 30 minutes from the airport and take passengers to whatever hotel they are staying at. The price is approximately 4 euros per person. I assume the time of journey depends on the number and location of the stops, which varies depending on which passengers are on each bus. To return from the hotel to the airport you can book the same shuttle, but you must do it one day in advance. The staff at Hotel Beta Porto can help you to make these arrangements.

Metro: Line E of the Porto Metro system to the airport is scheduled to open in May 2006, but as of today (May 5, 2006) it is not yet open. You can visit the website of the Porto Metro System before departing to Porto in order to check if this Metro line is an option for your transportation between hotel and airport: http://www.metrodoporto.pt

2. Congress Meeting Site: Ordem dos Medicos, Centro de Cultura e Congressos
Rua De Delfim Maia, 405
Tel: +351 – 22 507 01 00
http://www.nortemedico.pt

Walking Directions from Hotel Beta Porto to the Congress Site

![Walking Directions Map](www.viamichelin.com)

<table>
<thead>
<tr>
<th>Departure: “Hotel Beta Porto”, Rua Do Amial 607</th>
</tr>
</thead>
<tbody>
<tr>
<td>Take: Rua Do Amial</td>
</tr>
<tr>
<td>Turn left: Rua Do Coronel Almeida Valente</td>
</tr>
<tr>
<td>Turn right: Rua Conde D Aurora</td>
</tr>
<tr>
<td>Take: Rua De Leonardo De Coimbra</td>
</tr>
<tr>
<td>-------------------------------------------------</td>
</tr>
<tr>
<td>Destination: Congress site: “Ordem dos Medicos”, Rua De Delfim Maia 405</td>
</tr>
</tbody>
</table>

Total Distance: 0.8 km
Total Walking Time: 11 minutes
3. Local transportation

Metro: The closest Metro stop to the Hotel Beta Porto is Polo Universitarario on Line D (yellow).


The public bus system also offers an open-top-bus tour Tuesday through Sunday around Porto's touristic and historic spots. A digitally recorded commentary in six languages (English, Spanish, German, Italian, French and Portuguese) will lead you throughout a 1.5 hour tour. The ticket allows you to board at any of the stops along the route to explore attractions and continue the journey later in the day. The ticket is also valid on public buses, for the rest of that same day.

Taxis: Taxi are supposed to be abundant and inexpensive in Porto, no more than 5-7 euros for a cross-town ride.

4. Entertainment

Congress organizers Henrique Barros and Mafalda Costa (FMUP, Porto) have organized 2 optional events for your entertainment on Friday and Saturday nights.

**Friday Night:** 50 tickets were purchased and will be distributed free of charge among interested congress participants who want to attend the following concert. Thirty people have contacted Mafalda Costa to express interest, and 11 tickets remain for those interested. To reserve your ticket from Mafalda Costa, email her at mph@med.up.pt

<table>
<thead>
<tr>
<th>Casa da Música</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Program:</strong></td>
</tr>
<tr>
<td>I</td>
</tr>
<tr>
<td>Robert Schumann: Abertura Fausto</td>
</tr>
<tr>
<td>W. A. Mozart: Concerto para Clarinete e Orquestra</td>
</tr>
<tr>
<td>II</td>
</tr>
<tr>
<td>Dmitri Shostakovich: Sinfonia Nr. 5</td>
</tr>
</tbody>
</table>

Daniel Raiskin

direcção musical

Martin Fröst

clarinete
**Saturday Night:** A large group reservation will be made by the organizers for dinner at one of Porto’s historic Port Wine Lodges. Interested participants will have the opportunity at congress registration on Friday morning to reserve a place for dinner Saturday night. Each dinner guest will cover the cost of his/her own meal and drinks, but the event will be organized by FMUP. A bus will be arranged to take participants between the dinner and the hotel.

5. **Links to Additional Information About Porto**

- [http://goeurope.about.com/cs/opportoportugal/a/porto_guide.htm](http://goeurope.about.com/cs/opportoportugal/a/porto_guide.htm)
- [http://portugal-info.net/costaverde/porto.htm](http://portugal-info.net/costaverde/porto.htm)