Gestational age patterns of fetal and neonatal mortality rates: the Euro-Peristat project

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Lité 149 Recherches épidémiologiques en santé périnatale et santé des femmes

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## Background

- The first EPHR showed wide variability in perinatal mortality rates between European countries
- The highest mortality rates were approximately 3.5 times higher than the lowest mortality rates



#### EUROPEAN PERINATAL HEALTH REPORT

by the EURO-PERISTAT project in collaboration with SCPE, EUROCAT & EURONEONET

Data from 20



# Background

- Fetal Mortality Rate per 1000 total births ranged from 2.6 (Slovak Republic) to 9.1 (France)
- Neonatal Mortality Rate per 1000 live births ranged from 1.6 (Cyprus) to 5.7 (Latvia)





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# Aim

To evaluate gestational age related differences in fetal and neonatal mortality between countries in order to better understand differences between low versus high mortality countries



# Aim

- To what extent do deaths at very early gestational ages contribute to the variation in mortality rates?
- Do low mortality countries have higher proportions of death in the very early period of gestation for instance?
- Do high mortality countries have higher proportions of death at later gestational ages?

# Euro-Peristat project

Euro-Peristat developed a list of valid and reliable indicators for monitoring and evaluating perinatal health

- 25 EU Member States and Norway participated
- Data from 2004 were collected
- Data from 29 countries/regions were analysed

# Euro-Peristat definitions

- Inclusion criteria: 22 completed weeks of gestation
- Fetal mortality rate is defined as the number of fetal deaths before or during birth in a given year per 1000 live and stillbirths in the same year
- Neonatal mortality rate is defined as the number of neonatal deaths in a given year per 1000 live births in the same year
- If data could not be provided using this definition, local definition was used, for example in Hungary and Sweden
- To what extent should countries who provided data using their own definitions be included for international comparison?



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# Registration differences

- Underestimation of mortality rates
- Legal limit of registration
  - 24 or 28 weeks of gestation
  - birth weight limit ( $\geq$  500 gram)
- Terminations of pregnancies
  - are included or not
  - are illegal or not





## Variation in fetal and neonatal mortality rates

	Fetal Mortality Rate per 1000 total births	Neonatal Mortality Rate per 1000 live births
At or after 22 weeks	2401	1457
AT OF UTTEL 22 WEEKS	2.0 - 7.1	1.0 - 3.7
At or after 28 weeks	1.7 - 4.9	1.2 - 4.0
At or after 37 weeks	0.5 - 2.4	0.2 - 2.7

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At or after 37 weeks	0.5 - 2.4	0.2 - 2.7

At term there are still substantial differences between countries with highest and lowest mortality rates



# Exclusion of births on fetal mortality

- After exclusion of extremely preterm births, a large decline was observed for France (57%), indicating that a large proportion of fetal deaths in France occurred at 22-27 weeks
- For other countries the decline ranged between 0% (Malta) and 41% (Northern Ireland)



#### Proportion of fetal death at 22-27 weeks



Copenhagen, October 24 2010





#### Proportion of fetal death at 37 weeks and up





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## Exclusion of births on neonatal mortality

- After excluding extremely preterm births the neonatal mortality rate declined with 50% or more for England and Wales and Northern Ireland
- In Slovenia, Austria, Finland and the Netherlands large proportions of neonatal deaths also occurred at 22-27 weeks



## Proportion of neonatal death at 22-27 weeks



16



## Proportion of neonatal death at 37 weeks and up



## Fetal versus neonatal mortality ≥ 22 weeks



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## Fetal versus neonatal mortality ≥ 22 weeks



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## Fetal versus neonatal mortality ≥ 28 weeks



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## Fetal versus neonatal mortality ≥ 37 weeks



#### Early and late neonatal mortality rate





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### Early versus total neonatal mortality rate



#### Late versus total neonatal mortality rate



## Early versus late neonatal mortality rate



#### Early versus late neonatal mortality rate



New member states (rho = 261; p = 0.618) vs. old member states (rho = -302; p = 0.184)

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# Conclusions

- Registration differences are still important contributors to variation in mortality rates between countries, especially for stillbirths
- Registration differences do not explain the variation between countries which persists after excluding all preterm births

# Conclusions

- The fetal mortality is correlated with the neonatal mortality, but with several different patterns
  - Countries with the same level of neonatal mortality, have different levels of fetal mortality
  - Countries with the same level of fetal mortality, have different levels of neonatal mortality
- Total neonatal mortality depends on early neonatal mortality in more developed countries, but on early and late neonatal mortality in less developed countries



# Conclusions

- Absolute rates of mortality are not associated with a specific pattern:
  - Iow mortality countries do not necessarily have higher proportions of death among the (extremely) preterm
  - high mortality countries do not all have higher proportions of death among the (near) term births
- It appears that PATTERNS of mortality are different in addition to LEVELS of mortality

