

# Congenital Anomalies as Preventable Rare Diseases

*International Conferences for Rare Diseases and Orphan Drugs*

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*The authors declare no conflict of interest*

**Eurocat**

# **European Surveillance of Congenital Anomalies**

**WHO Collaborating Centre for the Epidemiological Surveillance  
of Congenital Anomalies**

**Supported by the EU-Commission Public Health Directorate  
Programme of Community Action on Rare Diseases**

# What is EUROCAT?

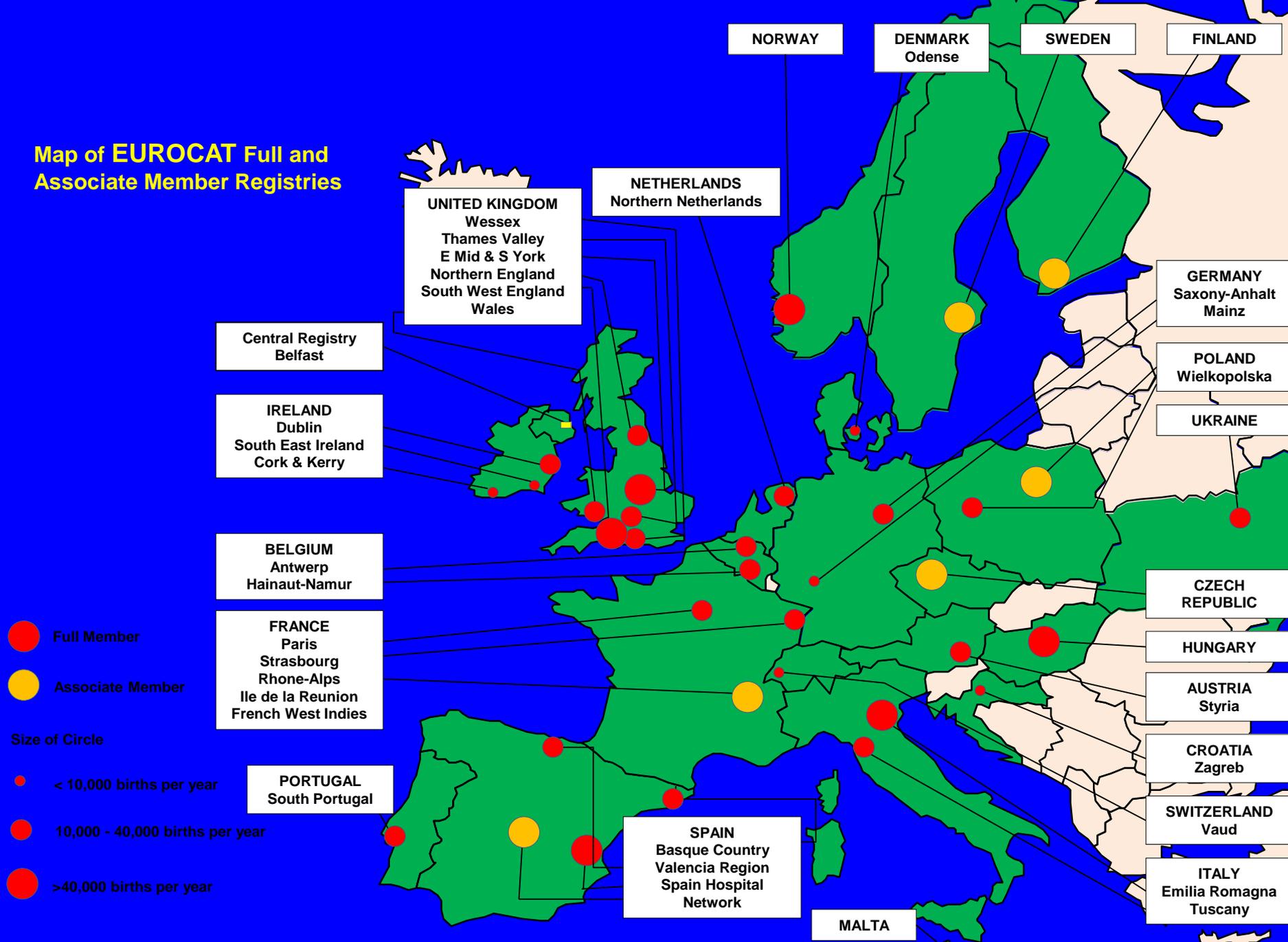
- European network of population-based registries for the epidemiologic surveillance of congenital anomalies.
- Started in 1979
- More than 1.7 million births surveyed per year in Europe, around 31% of the EU birth population
- 48 registries in 21 countries of Europe
- Standardised central database on cases of congenital anomaly among livebirths, stillbirths and terminations of pregnancy for fetal anomaly

[www.eurocat.ulster.ac.uk](http://www.eurocat.ulster.ac.uk)

# EUROCAT:Mission

- to support primary prevention of congenital anomalies (CA) and provision of appropriate services to pregnant women, affected children and their families by the collection, analysis, interpretation and dissemination of population-based epidemiologic data. Epidemiological surveillance should inform policies and interventions to reduce the size of, and inequalities in, the public health burden of CA.
- Through the network of high quality multiple source population-based CA registries ascertaining live births, still births/fetal deaths, and terminations of pregnancy following prenatal diagnosis of CA, EUROCAT enables the provision and dissemination of accessible and updated epidemiological information, including prevalence, prenatal diagnosis and perinatal mortality data, and the pooling of population-based data on monogenic syndromes and rare chromosomal abnormalities.

# Map of EUROCAT Full and Associate Member Registries



# What epidemiological information can be found on the EUROCAT website?

- Interactive Website Prevalence Tables <http://www.eurocat-network.eu/accessprevalencedata/prevalencetables>.
- The prevalence of selected Monogenic Syndromes in Europe
- EUROCAT Perinatal Mortality <http://www.eurocat-network.eu/accessprevalencedata/keypublichealthindicators>.
- Prenatal Detection Rates for the latest 5 year period <http://www.eurocat-network.eu/prenatalscreeninganddiagnosis/prenataldetectionrates>
- EUROCAT Statistical Monitoring for both trends and clusters in time in order to detect signals of new or increasing teratogenic exposures which may require public health action.

Prevalence data by individual anomaly (eg. Spina bifida) or subgroup (eg. Neural tube defects)

# EUROCAT contribution to RD prevalence

- EUROCAT prevalence of CA is the proportion of births affected by a CA:
- EUROCAT Live birth prevalence =  $(\text{No. Cases (LB)} / \text{No. Births (LB)}) \times 10,000$
- The “actual” current EU population prevalence depends on past LB prevalence and past survival to adulthood and is therefore unknown
- EUROCAT LB prevalence provides the future maximum EU population prevalence - survival to adulthood of babies with CA is lower than in the general population
- EUROCAT registers cases of CA diagnosed prenatally or in infancy with some conditions added later.

# EUROCAT contribution to RD prevalence

- Congenital anomalies occur in around 2% of births in Europe: (173.08 per 10,000 live births in 2012)
- 70 of 89 EUROCAT subgroups were rare (< 5 per 10,000)
- For the rare subgroups LB prevalence is 96 per 10,000 births
- Estimate 4.8M affected persons in Europe
- > 50,000 affected babies per year

**16% of rare disease patients in Europe have a rare congenital anomaly**

Sources:

EUROCAT Website Database: <http://www.eurocat-network.eu/ACCESSPREVALENCEDATA/PrevalenceTables> (data uploaded 24/03/2014)

EUROSTAT crude birth rate (1<sup>st</sup> Jan 2012). Available at:

<http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=tps00111&plugin=1>

# EUROCAT data sharing

- Many genetic syndromes are amongst the “rarest” of the CA
- When CA are so rare EUROCAT pools data across registries to show prevalence
- EUROCAT can provide total prevalence (LB, FD, and TOPFA) of selected **Monogenic Syndromes in Europe** with ICD10-BPA codes

# EUROCAT: Syndrome DATA

	ICD10-BPA	Number of cases	Prevalence per 10,000 births
Aarskog syndrome	Q8710	7	0.03
Acrocephalopolysyndactyly (all types)	Q8700	7	0.03
Alagille syndrome	Q4471	25	0.10
Angelman syndrome	Q8785	31	0.12
Apert's syndrome (acrocephalosyndactyly type I and II)	Q8701	32	0.13
Bardet-Biedl syndrome	Q8781	8	0.03
Beckwith-Wiedemann syndrome (EMG syndrome)	Q8730	78	0.31
Cleidocranial dysplasia	Q7402	11	0.04
Cockayne's syndrome	Q8711	5	0.02
Cornelia de Lange syndrome (de Lange syndrome)	Q8712	33	0.13
Crouzon's disease (craniofacial dysostosis type I)	Q751	24	0.09
Di George syndrome	D821	209	0.82
Dubowitz syndrome	Q8713	6	0.02
Ehlers-Danlos syndrome	Q796	22	0.09
Frontonasal dysplasia	Q7581	15	0.06
Holt-Oram syndrome (heart-hand syndrome)	Q8720	11	0.04
Continued.....			

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european surveillance of  
congenital anomalies

Special Report: Congenital Anomalies are a Major Group of  
Mainly Rare Diseases

(December 2012)

Access at <http://www.eurocat-network.eu/content/Special-Report-Major-Group-of-Mainly-Rare-Diseases.pdf>

# Why did EUROCAT create this report?

- To address issues including: Are all CA rare, or just some?
- To highlight that EUROCAT registries differ from RD as they are population based ie. register all cases in a defined geographical area, and are aimed at surveillance underpinning primary prevention
- To address confusion regarding prevalence : population vs at birth
- To highlight the contribution of EUROCAT to European Action on RD
- To emphasise the importance of:
  - pooling data
  - being population based
  - primary prevention of CA

# Many CA are Potentially Preventable

EUROCAT data :

- 1.9% of CA are monogenic syndromes,
  - 13% chromosomal anomalies
  - 0.65% teratogenic syndromes - maternal infections, drugs or alcohol.
- 
- The precise cause of most congenital anomalies is not known
  - Most CA are probably caused by an interaction of environmental and genetic factors.
  - Genetic factors play an important role but by changing exposures we can prevent CA.
  - Environmental – used in the broadest sense as non-genetic (although interacting with genetic factors), encompassing physical, chemical, biological and social factors, concentrating on factors that are modifiable.
  - Examples: Spina bifida, Fetal Alcohol spectrum disorder

# EUROCAT Surveillance: Underpinning Prevention

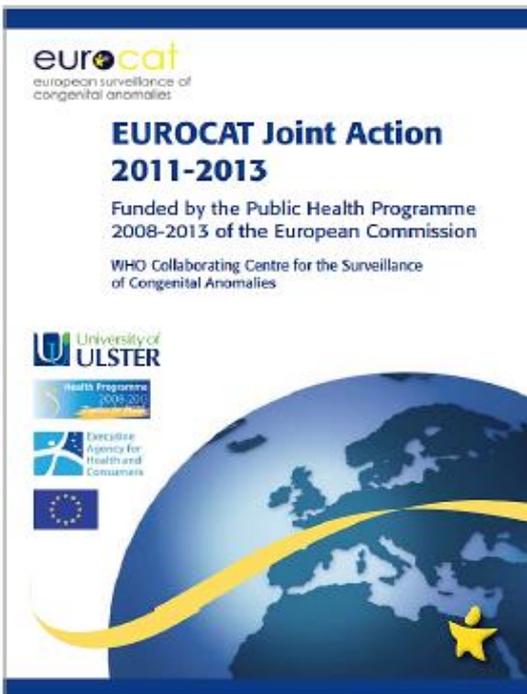
- Provision of essential epidemiological information on CA in Europe
- Detection, investigation, reporting of clusters/trends in CA
  - Facilitation of early warning of new/changing teratogenic exposures
  - Improved capacity for rapid response
- Establishment of a strategy to include primary prevention of CA in national plans for RD
- Evaluation of the effectiveness of primary prevention at population level
- Contribution to the development and implementation of a European postmarketing pharmacovigilance system (EUROmediCAT [www.euromedicat.eu](http://www.euromedicat.eu))
  - Evaluation and provision of early warning of teratogenic risk of CA related to medication use in early pregnancy
  - Focus on medication for chronic diseases: new antiepileptics, insulin analogues, anti-asthmatics, antidepressants
- Provision of a ready collaborative network and infrastructure for research related to the causes and prevention of CA

# PRIMARY PREVENTION OF CONGENITAL ANOMALIES

EUROCAT (European Surveillance of Congenital Anomalies) and  
EUROPLAN (European Project for Rare Diseases National Plans Development)

Recommendations on policies to be considered for the primary  
prevention of congenital anomalies in National Plans and Strategies  
on Rare Diseases

Endorsed by



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[www.eurocat-network.eu](http://www.eurocat-network.eu)

Grant N.: 2011 22 01

[www.europlanproject.eu](http://www.europlanproject.eu)

# The Scope of Policy Actions Needed for Primary Prevention of CA

- In the field of medicinal drugs
- In the field of food/nutrition and lifestyle
- In the field of health services
- In the field of environmental pollution including the workplace

# EUROCAT

- Collects epidemiological data
- Looks for causes
- Looks for how causes can be prevented
- Provides scientific data for policy makers, health professionals, patients and the public

# Acknowledgments

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- *"We thank the many people throughout Europe involved in providing and processing information, including affected families, clinicians, health professionals, medical record clerks, and registry staff"*