



enrieco

“Environmental Health Risks in European Birth Cohorts”



Maria Vassilaki¹, Manolis Kogevinas^{2,3}, Martine Vrijheid², Maribel Casas^{2,4}, Mark Nieuwenhuijsen^{2,4}, for the ENRIECO consortium (www.enrieco.org)

[1] Department of Social Medicine, Faculty of Medicine, University of Crete, Heraklion, Greece, [2] Centre for Research in Environmental Epidemiology (CREAL), Barcelona, Spain, [3] National School of Public Health, Athens, Greece, [4] Municipal Institute of Medical Research (IMIM), Barcelona, Spain.



To advance knowledge on specific environment and health causal relationships ENRIECO will evaluate existing tools and data on exposures and outcomes within European birth cohorts, support database building, and develop recommendations for future research.

WHY EUROPEAN COLLABORATION?

There are many pregnancy and pregnancy and birth cohorts in Europe, with sample sizes ranging from a few hundred to tens of thousands. These cohorts are currently collecting a wealth of information on environmental exposures and child health outcomes, but data are often of fragmented nature and there is little coordination to structure and consolidate scattered research.

Table 1. ENRIECO cohorts and outcomes measured

Cohort	Country	Start of enrolment	N children	Birth outcomes	Neurobehaviour	Growth and obesity
ABCD	Netherlands	2003-2004	7863	✓	✓	✓
ALSPAC	United Kingdom	1990-1992	14000	✓	✓	✓
APREG	Hungary	2000-2006	2800	✓	✓	✓
BAMSE	Sweden	1994-1996	4089	✓	✓	✓
BIB	United Kingdom	2007-2010	13000	✓	✓	✓
Faroes Islands	Faroes Islands	1986-2009	2351	✓	✓	✓
CONER	Italy	2004-2005	654	✓	✓	✓
DNBC	Denmark	1996-2002	96986	✓	✓	✓
Duisburg	Germany	2000-2001	234	✓	✓	✓
EDEN	France	2003-2006	1873	✓	✓	✓
EFESE/ELFE	France	2011-2012	20000	✓	✓	✓
FLEHS	Belgium	2002-2004	1196	✓	✓	✓
Generation R	Netherlands	2001-2005	9778	✓	✓	✓
Generation XXI	Portugal	2004-2006	8654	✓	✓	✓
GESP II	Italy	2003-2004	708	✓	✓	✓
GINIplus	Germany	1995-1998	5991	✓	✓	✓
HUMIS	Norway	2002-2009	2500	✓	✓	✓
INMA	Spain	1997-2007	4123	✓	✓	✓
INUENDO	Denmark	2002-2004	1322	✓	✓	✓
KANC	Lithuania	2007-2009	4000	✓	✓	✓
KOALA	Netherlands	2000-2003	2834	✓	✓	✓
LISA	Germany	1997-1998	3097	✓	✓	✓
LUKAS	Finland	2002-2005	442	✓	✓	✓
MAS	Germany	1990	1314	✓	✓	✓
MoBa	Norway	1999-2008	107400	✓	✓	✓
NFBC 1986	Finland	1997-2007	9479	✓	✓	✓
NINFEA	Italy	2005+	7500	✓	✓	✓
PCB cohort	Slovakia	2001-2004	1139	✓	✓	✓
PÉLAGIE	France	2002-2006	3460	✓	✓	✓
PIAMA	Netherlands	1996-1997	4146	✓	✓	✓
REPRO_PL	Poland	2007-2011	1300	✓	✓	✓
RHEA	Greece	2007-2008	1500	✓	✓	✓

Figure 1. Countries with participating cohorts



ENRIECO will:

- 1) Create an **inventory** of all existing birth cohorts in Europe with data on environmental exposures, to be linked to www.birthcohorts.net (table 1).
- 2) **Working groups** will evaluate European birth cohort research in specific **exposure** areas such as (table 2):
 - ❖ Air and water pollutants
 - ❖ Heavy metals
 - ❖ Pesticides
 - ❖ Radiations
 - ❖ Persistent organic pollutants
 - ❖ Environmental tobacco smoke
 - ❖ Chemicals of emerging concern
and in specific **outcome** areas such as (table 1):
 - ❖ Reproductive outcomes,
 - ❖ Asthma and allergies,
 - ❖ Neurodevelopment,
 - ❖ Growth and obesity.
- 3) **Case studies** will examine areas in which pooling of data across cohorts may be feasible (for example PCBs and birth outcomes).

ENRIECO brings together over 30 cohorts and information on around 250,000 children from across Europe (figure 1).

Table 2. Biomarkers of exposure measured

Cohort	Heavy metals	Pesticides and POPs	Other exposures
ABCD	Total metals spectrum	-	-
Faroes Islands	Hg, Pb, Se	chlordan; DDT&DDE; dieldrin and endrin; heptachlor; HCB; mirex; PCBs; TBT	BPA, phthalates; BFR; PFCs; BFR
DNBC	-	-	PFOA and PFOS
Duisburg	Hg, Pb, Cd, Se	DDT&DDE; HCB; HCH; PCBs; PCDFs; PCDDs	BPA; DEHP-metabolites; PBDEs; PFCs; PFOA; PFOS; PFNoA; PFDEA; PFDoA; PFBS; PFHxS
EDEN	Hg, Pb, Cd, Mn, Se, B	-	BPA; phthalates; phenols
EFESE/ELFE	Pb	-	BPA; BFR; phthalates; PFCs
FLEHS	Pb, Cd	DDT&DDE; HCB; calux; PCBs	-
Generation R	-	Organophosphosphate pesticides	BPA; phthalates
HUMIS	-	DDT&DDE; HCH; mirex; PCBs; PCDDs; PCDFs; toxaphene	HBCD; PBDEs; phthalates
INMA	Hg, Pb, Cd, As, Mn, Zn, Cr, Ni, Fe	DDT&DDE; HCB; HCH; PCBs; α -HCH, β -HCH, δ -HCH, γ -HCH	BPA; phthalates; BFR; PFCs
INUENDO	Hg, Pb, Cd	DDT&DDE; HCB; CB-153	PBDEs; PFOS/PFOA
KANC	Mn, Fe	-	-
LUKAS	Hg, Pb, Cd, As, Se	DDT&DDE; PCBs; PCDDs; PCDFs; Organotins (OT); PCNs	phthalates; PBBs; PBDEs
MoBa	-	Organophosphosphate pesticides	BPA; phthalates
NINFEA	Pb, As, Cr, Ni	-	-
PCBs cohort	-	PCBs; dioxins	-
PÉLAGIE	Hg	aldrin; DDT&DDE; dieldrin and endrin; heptachlor; HCB; PCBs;	phthalates; BFR
REPRO_PL	Hg, Pb, Cd	Organophosphates; Triazine herbicides; Alachlore, metolachlore, acetolachlore; Propour.	-
RHEA	Hg, Pb, Cd, As, Mn	PCBs; dioxine, furanes	-
		DDT&DDE; HCB; PCBs	phthalates; BFR

Project duration:
2 years from March 2009

Funded by:
European Union's 7th Framework Programme
[Theme 6, Environment (Including Climate Change)]

