



Le coorti nascita come modello di studio delle relazioni ambiente e salute nei siti contaminati

Gaspare Drago IRIB-CNR

18.10.2023



Il Centenario del CNR è realizzato con il contributo della Presidenza del Consiglio dei Ministri e con il Patrocinio di Rai

PRESIDENZA DEL CONSIGLIO DEI MINISTRI

Struttura di missione anniversari nazionali ed eventi sportivi nazionali e internazionali

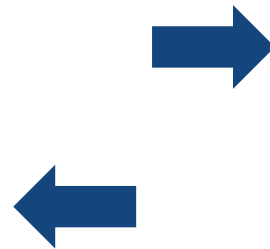


Epidemiologia Ambientale



Studio delle malattie attraverso l'**osservazione** della loro **distribuzione e dell'andamento** nella **popolazione** allo scopo di individuare i **determinanti ambientali** che ne possono indurre l'**insorgenza** e condizionare la **diffusione**.

I **determinanti ambientali** possono essere agenti **fisici** (ad esempio, radiazioni, temperatura), **chimici** (ad esempio, metalli pesanti, idrocarburi policiclici aromatici), o **biologici** (ad esempio, un virus);
un modello di comportamento (ad esempio, tarda età alla prima gravidanza); o un "**evento di vita**" (ad esempio, perdita di lavoro, lesioni)

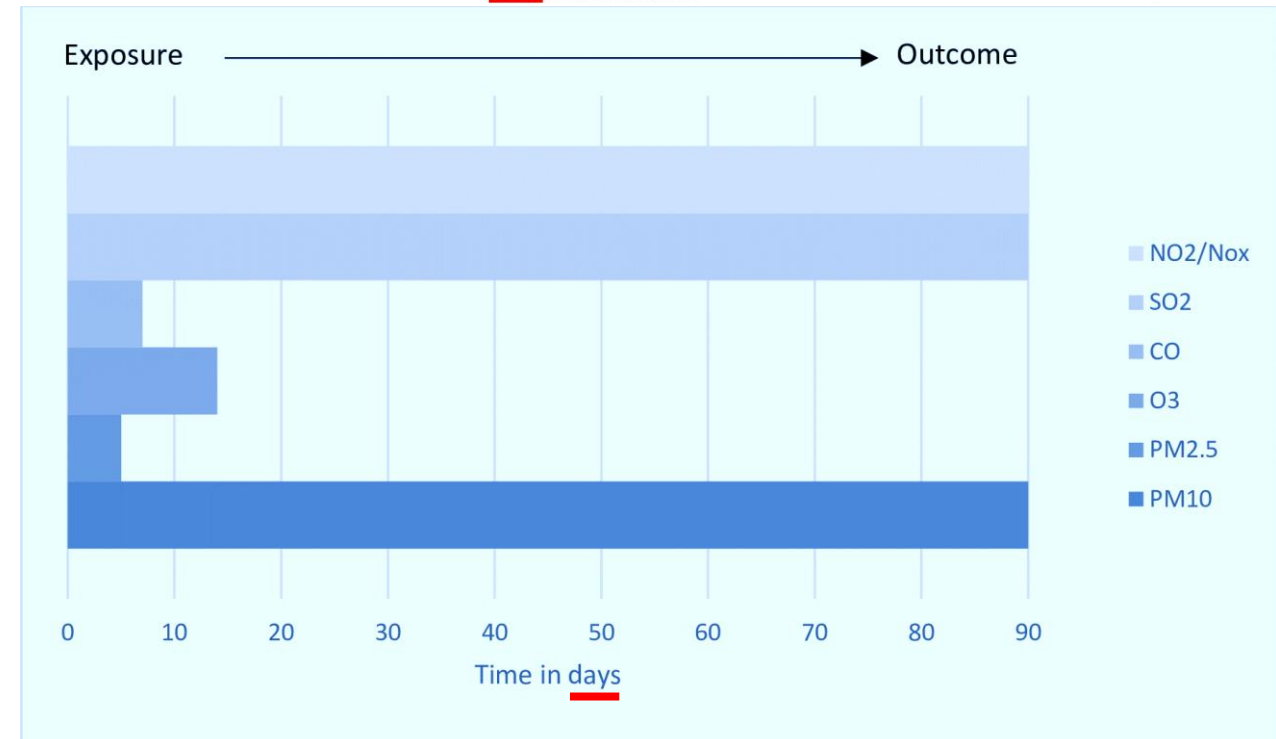
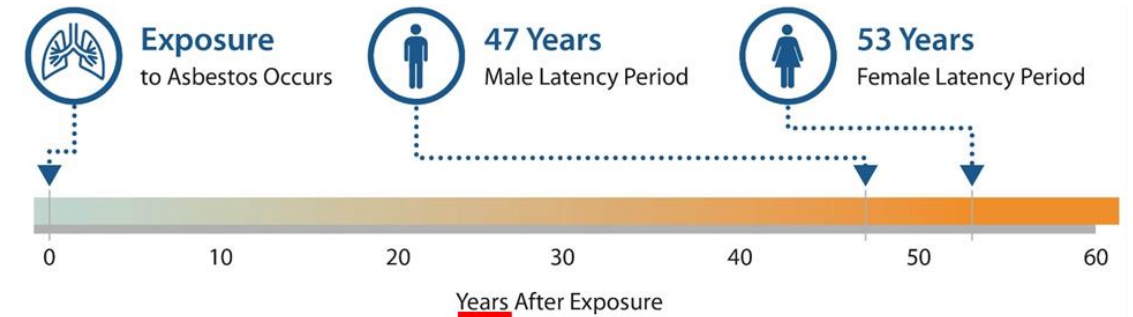


Epidemiologia Ambientale



Quali sono gli elementi essenziali di una indagine di Epidemiologia Ambientale?

- Un'esposizione che può essere Misurata/stimata
- Una popolazione Esposta (ed una non esposta)
- Una risposta biologica misurabile (che abbia un nesso plausibile con l'esposizione)



DOHAD

Developmental Origin of Health and Diseases



Barker, DJ, Osmond, C. (1986) Infant mortality, childhood nutrition, and ischaemic heart disease in England and Wales. *Lancet*.

Barker DJ. (2004) The developmental origins of adult disease. *J Am Coll Nutr*.



Ciò che accade qui

Può condizionare la salute per il resto della vita

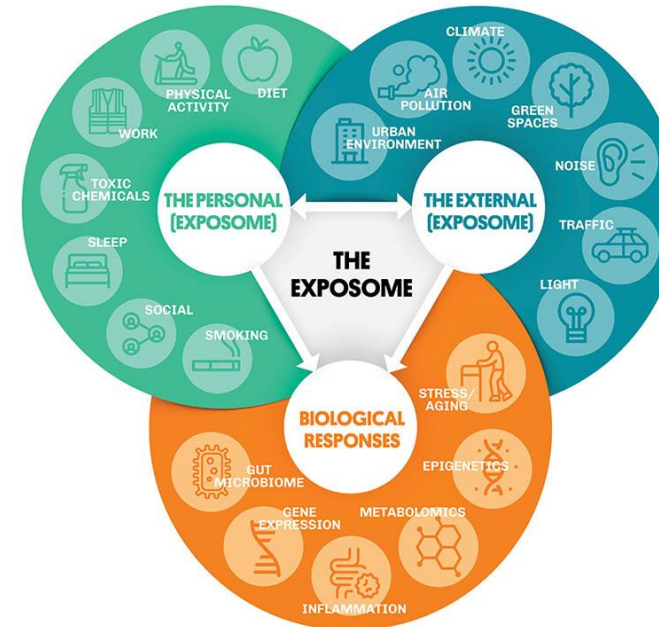


EXPOSOME

The totality of exposures to which an individual is subjected from conception to death



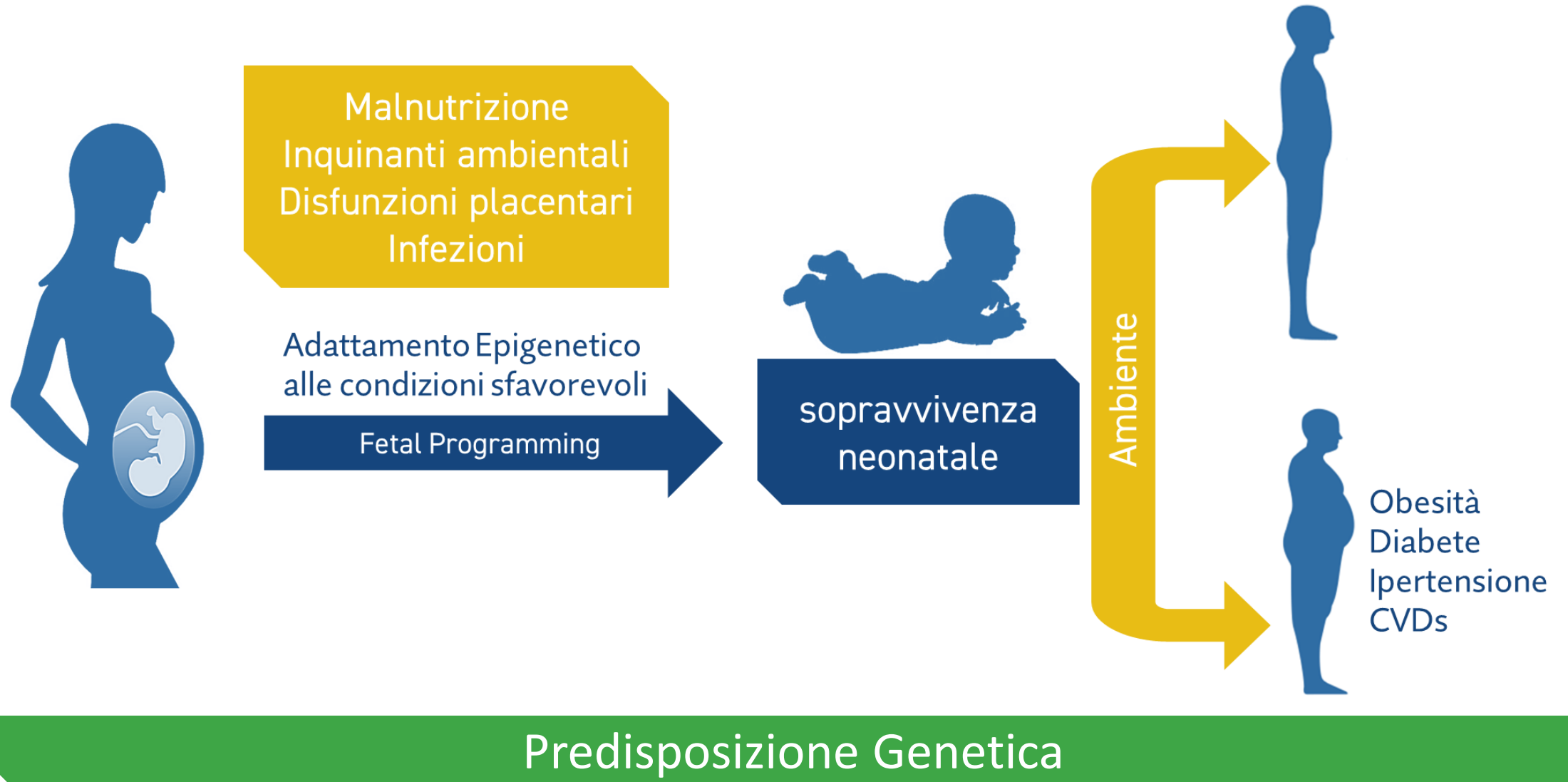
Wild CP. (2005) Complementing the genome with an "exposome": the outstanding challenge of environmental exposure measurement in molecular epidemiology. *Cancer Epid Biom Prev.*



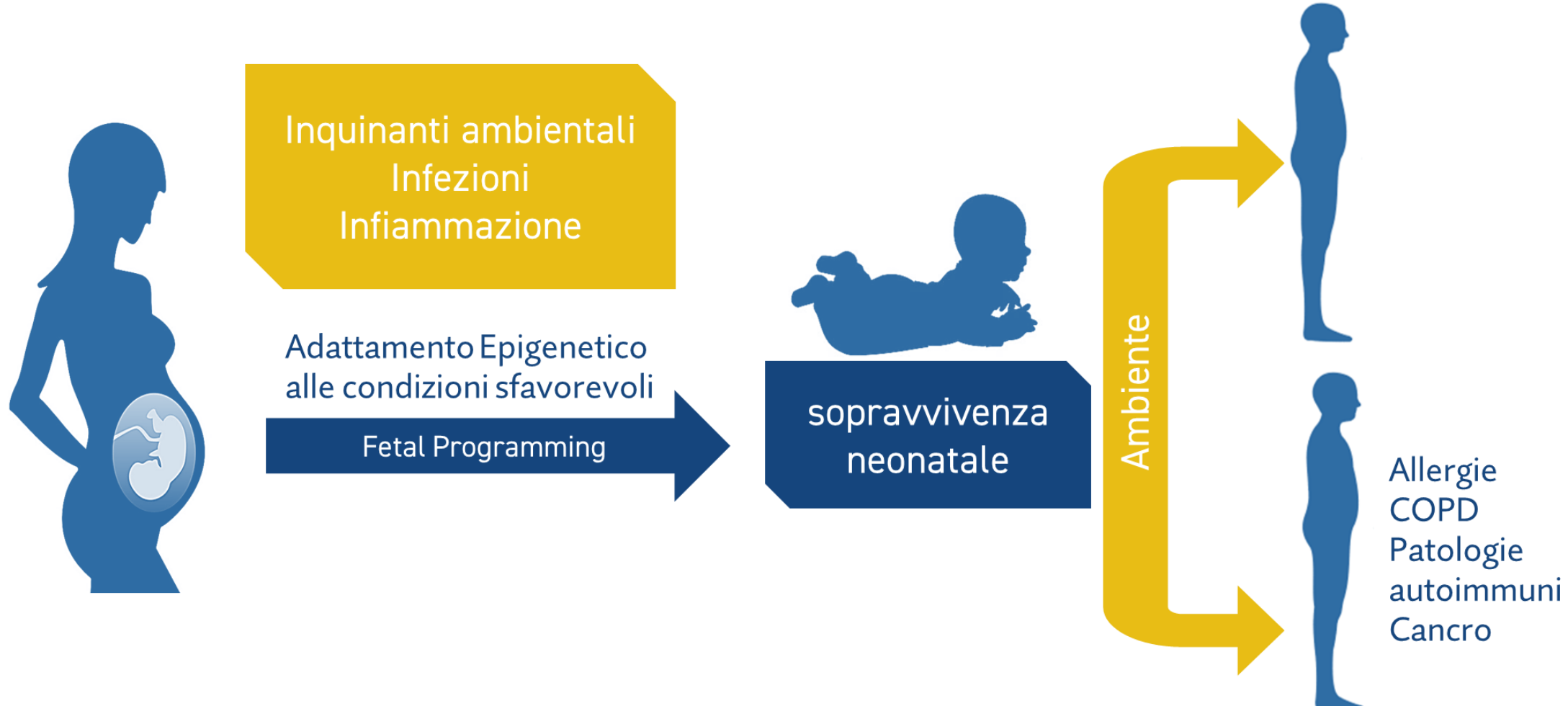
Valutazione delle esposizioni ripetute nel corso della vita



Life Course Epidemiology

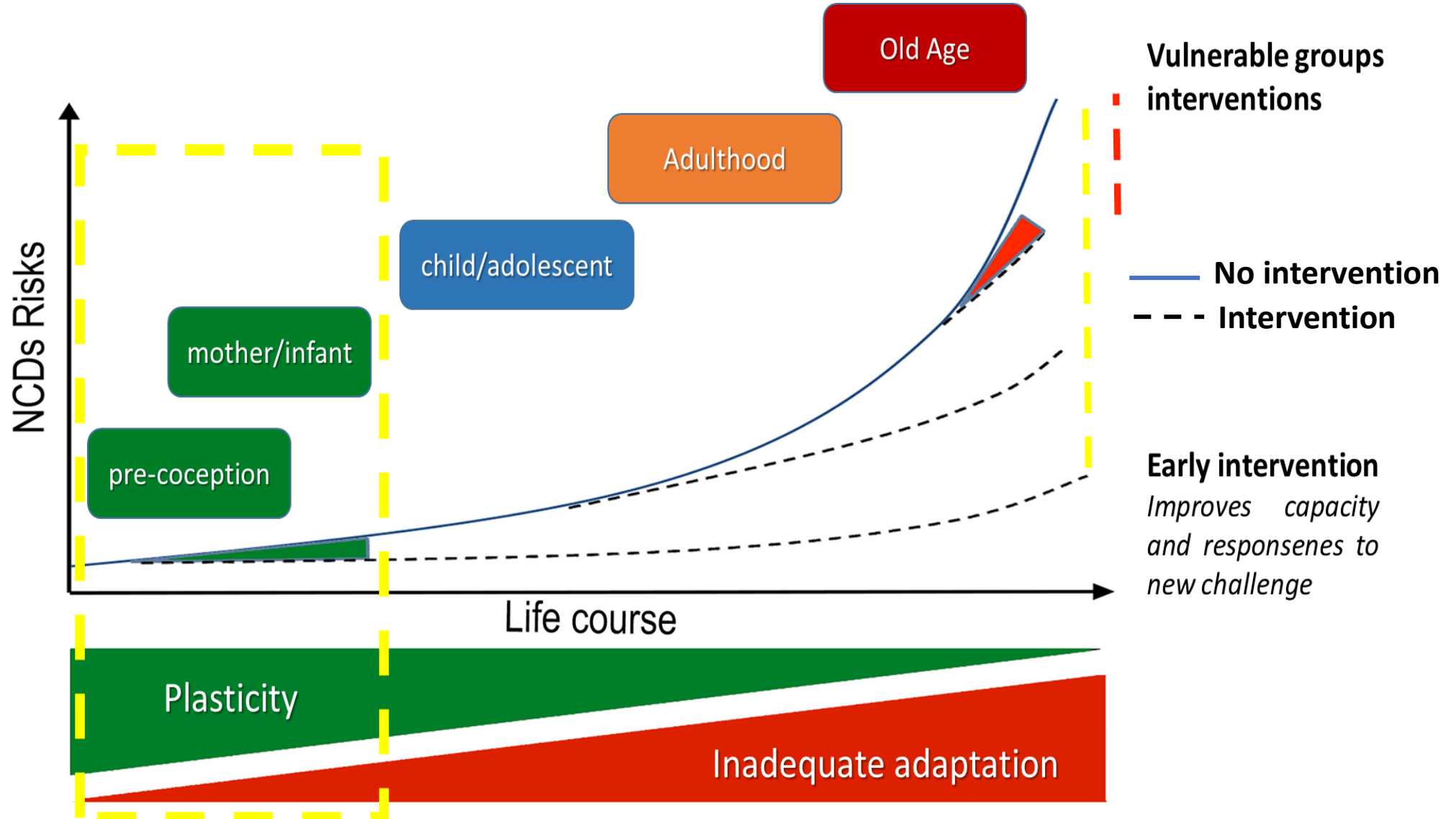


Life Course Epidemiology

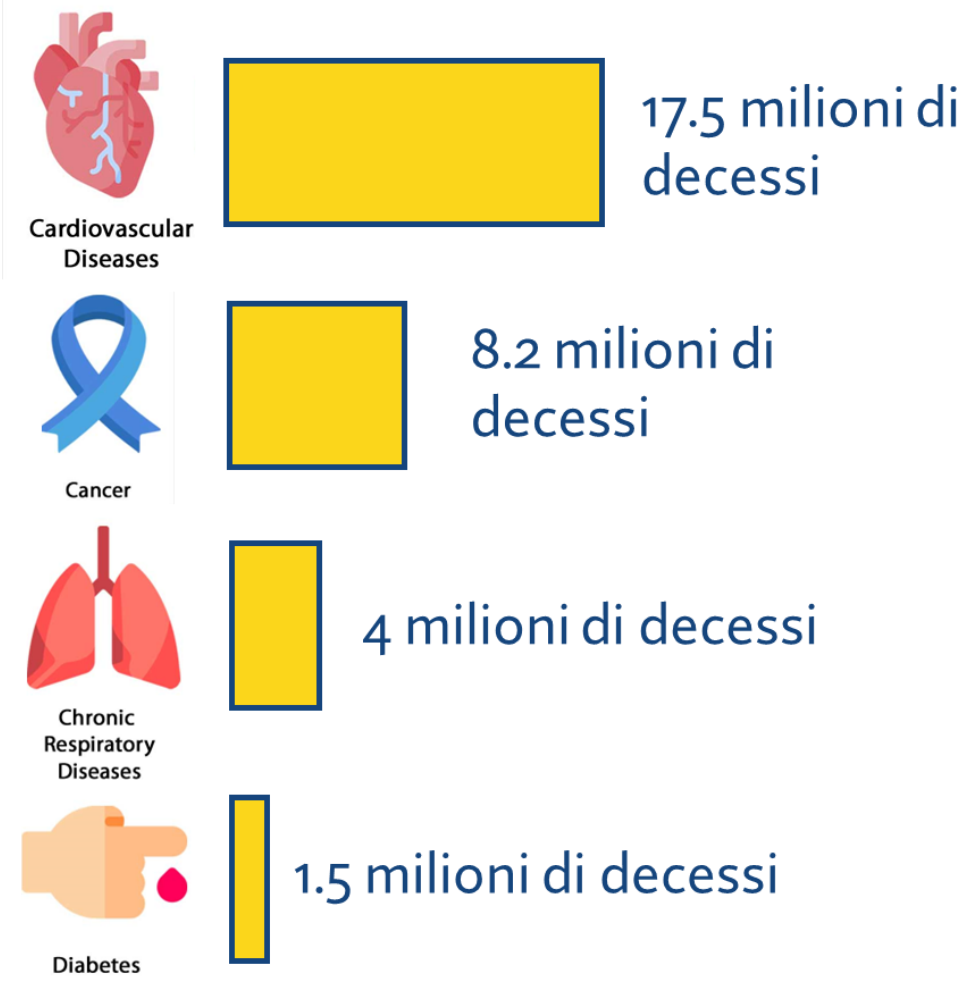


Predisposizione Genetica

Patologie non trasmissibili Non-Communicable Diseases (NCDs)



Patologie non trasmissibili Non-Communicable Diseases (NCDs)



MONITORING NONCOMMUNICABLE DISEASE COMMITMENTS IN EUROPE 2021



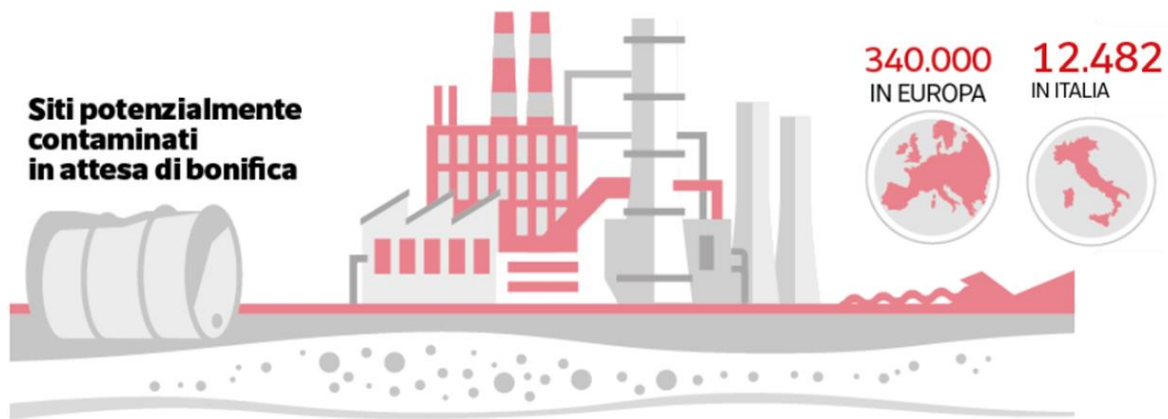
2030
Insostenibilità
economica

90%
delle morti premature

85%
anni vissuti con
disabilità



Siti di Interesse Nazionale per la bonifica



di cui **58**
siti di interesse nazionale
grave inquinamento con elevato rischio sanitario

Competenza della bonifica
↓
41 Ministero dell'Ambiente
↓
17 Regioni

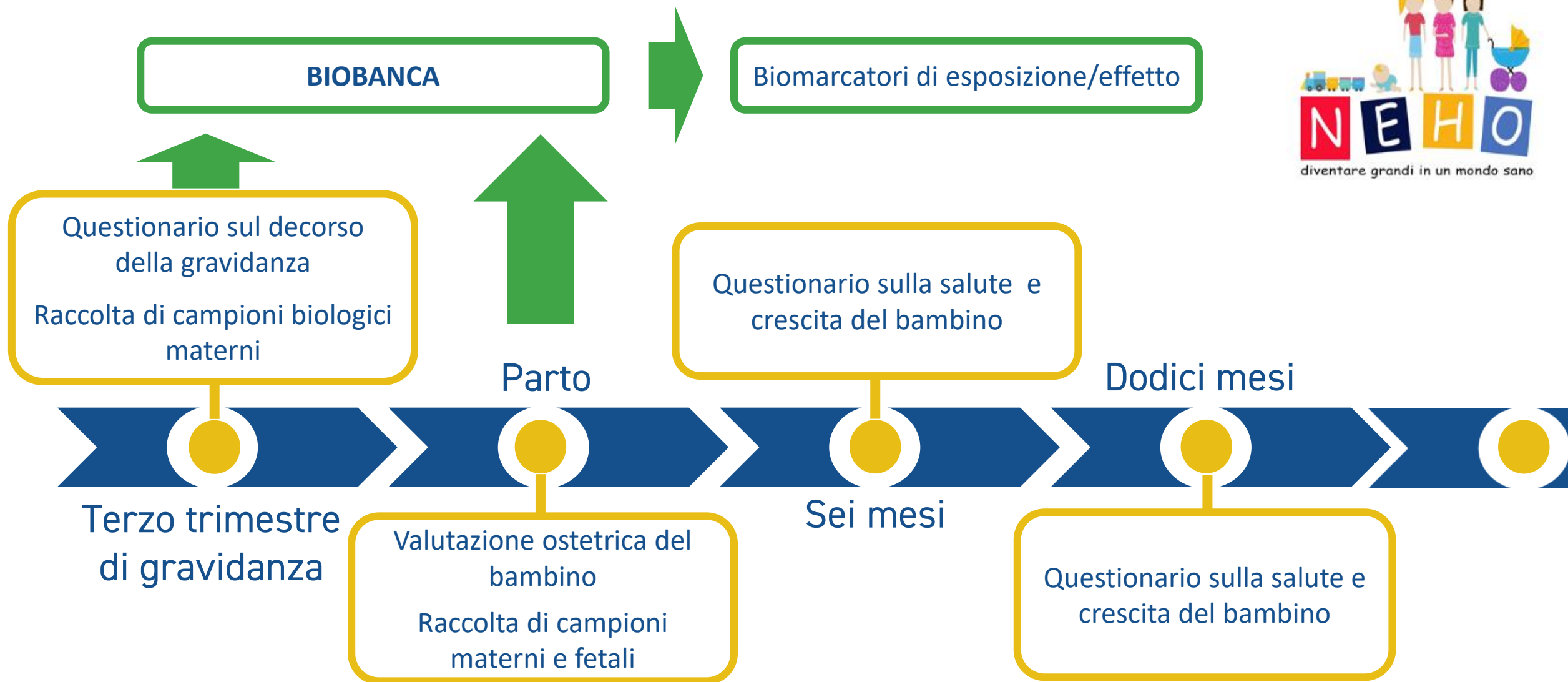
I rischi per la salute

Monitoraggio dell'Istituto Superiore di Sanità in 45 dei 58 siti



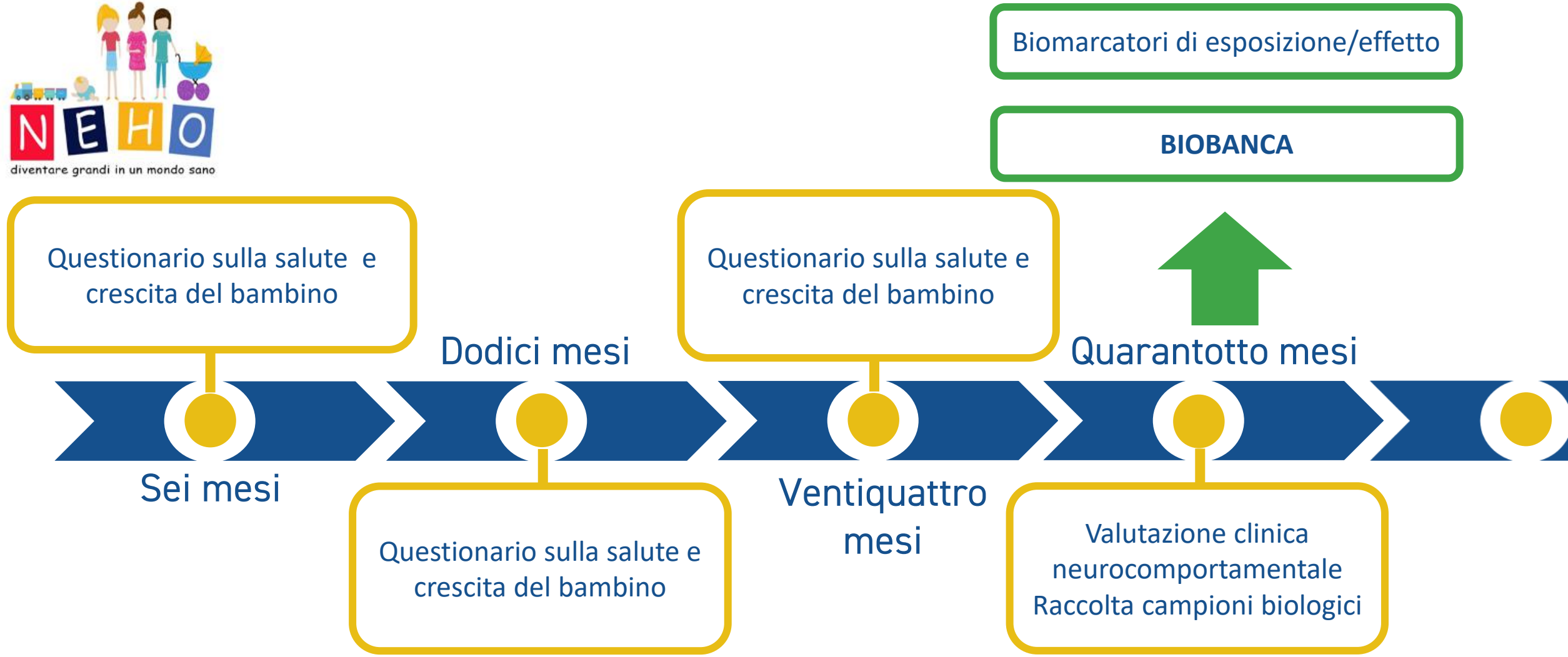
La coorte di nascita NEHO

Neonatal Environment and Health Outcomes



La coorte di nascita NEHO

Neonatal Environment and Health Outcomes



La coorte di nascita NEHO

Neonatal Environment and Health Outcomes

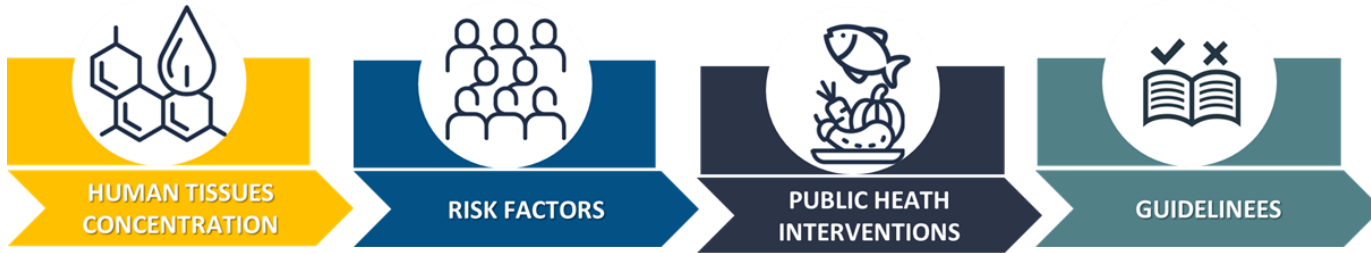


	AUGUSTA-PRIOLO 561	CROTONE 167	MILAZZO 117	p value	NEHO n=845
Maternal characteristics					
Age (year)	30,9 (±5,2)	31,0 (±5,6)	32,0 (±4,6)	0.13	31,1 (±5,2)
BMI (kg/m ²)	23,6 (±4,8)	23,4 (±4,1)	22,9 (±3,7)	0.32	23,4 (±4,6)
Weight Gain (kg)	12,1 (±4,0)	11,3 (±4,4)	12,9 (±3,9)	0.009	12,1 (±4,1)
Marital status				0.13	
Married	341 (61%)	117 (70,1%)	76 (65,0%)		534 (63,4%)
Never Married/Separated	218 (39%)	50 (29,9%)	41 (35,0%)		309 (36,6%)
Educational level				<0.0001	
Secondary school or lower qualification	158 (28,3%)	40 (24,2%)	12 (10,2%)		210 (25,0%)
High School	277 (49,6%)	83 (50,3%)	62 (53,0%)		422 (50,2%)
Degree or higher qualification	124 (22,1%)	42 (25,5%)	43 (36,8%)		209 (24,8%)
Delivery Characteristics					
Length of gestation (weeks)	39,4 (±1,2)	39,6 (±1,1)	39,9 (±1,0)	<0.0001	39,5 (±1,1)
Birth type				<0.0001	
Cesarean section	245 (43,7%)	29 (17,4%)	39 (33,3%)		313 (37,0%)
Vaginal	316 (56,3%)	138 (82,6%)	78 (66,7%)		532 (63,0%)
Newborn Characteristics					
Gender				0.42	
Female	259 (46,2%)	69 (41,3%)	57 (48,7%)		385 (45,6%)
Male	302 (53,8%)	98 (58,7%)	60 (51,3%)		460 (54,4%)

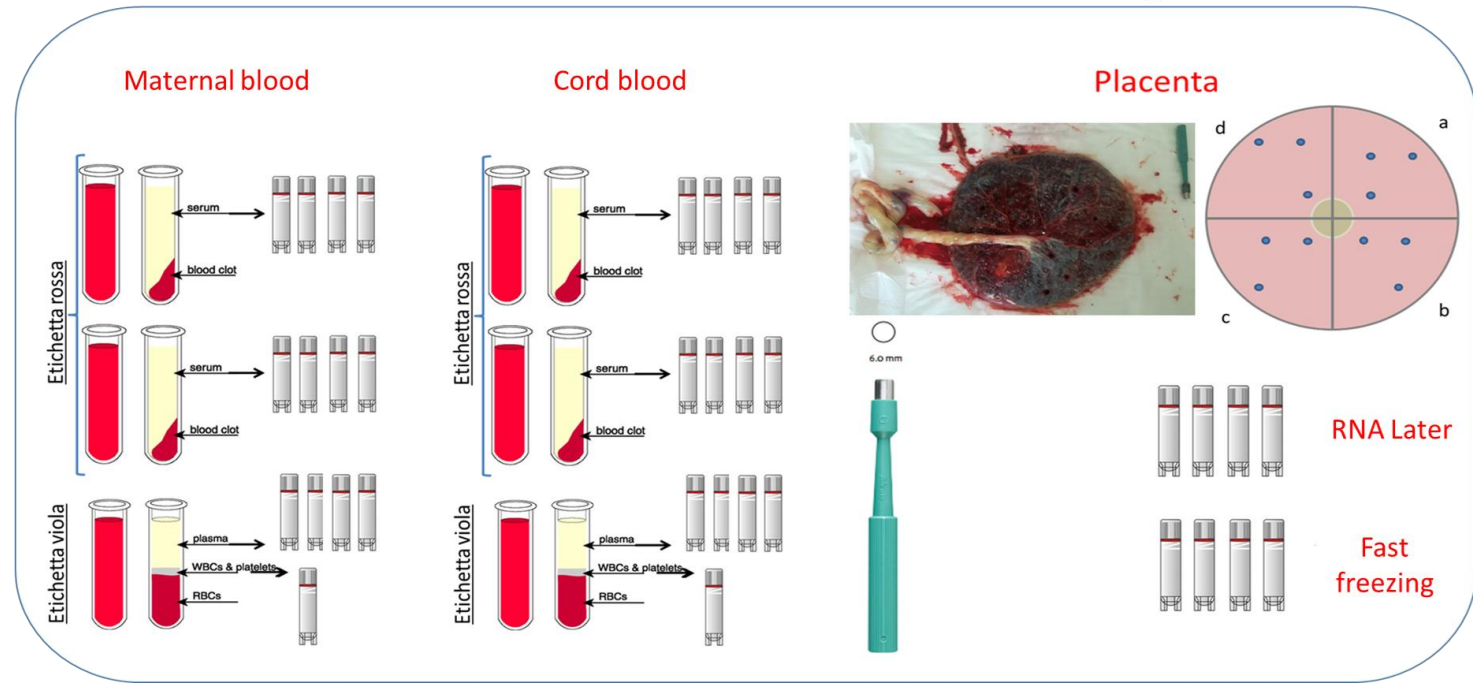


La coorte di nascita NEHO

Neonatal Environment and Health Outcomes



Coorte NEHO – Raccolta del materiale biologico



Collected Samples	NEHO
Maternal Serum	~6400
Maternal Plasma	~3300
Placenta	~6400
Cord Serum	~5700
Cord Plasma	~2750
Total	~24500

La coorte di nascita NEHO

Neonatal Environment and Health Outcomes



Article

Measuring Risk Perception in Pregnant Women in Heavily Polluted Areas: A New Methodological Approach from the NEHO Birth Cohort

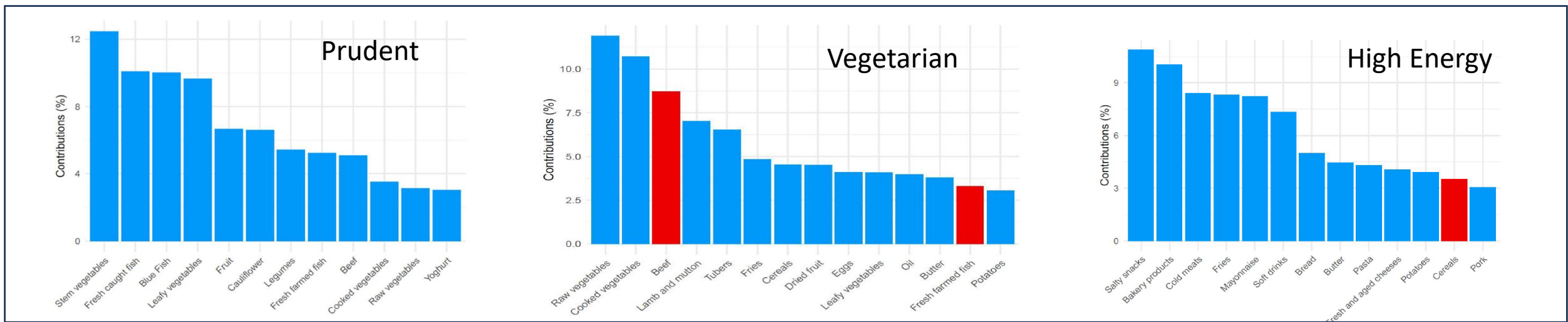
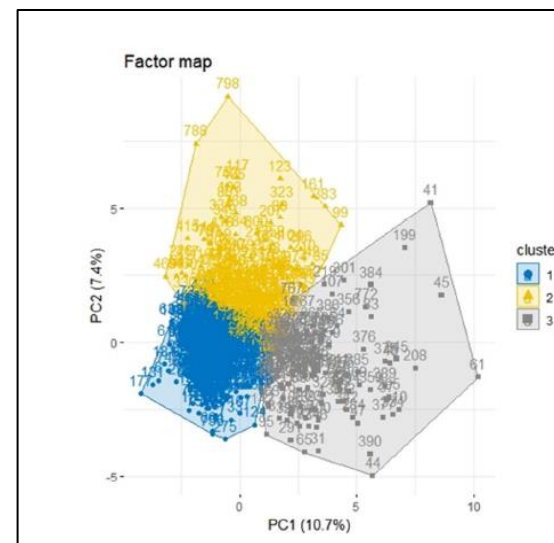
Silvia Ruggieri ^{1,†}, Sabina Maltese ^{1,†}, Gaspare Drago ^{1,*}, Simona Panunzi ², Fabio Cibella ¹, Fabrizio Bianchi ^{1,3}, Fabrizio Minichilli ³ and Liliana Cori ³



Article

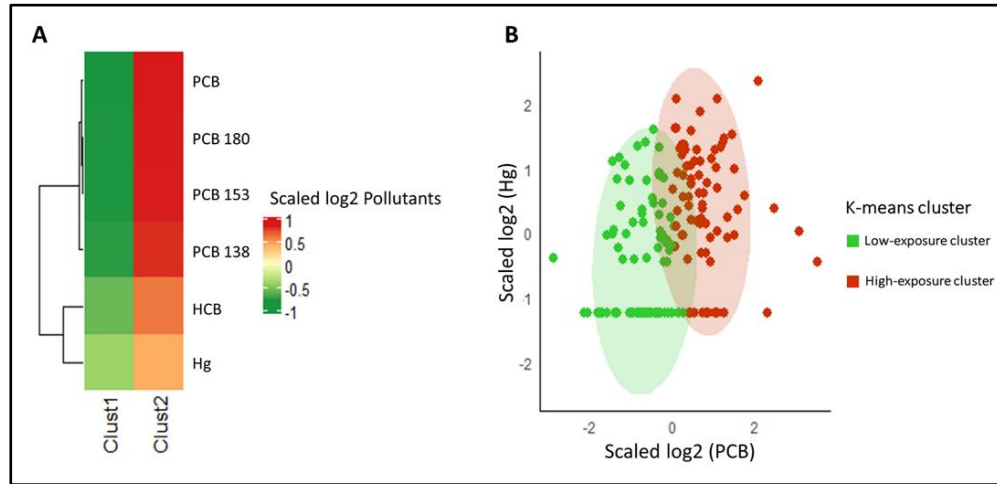
The Influence of Sociodemographic Factors, Lifestyle, and Risk Perception on Dietary Patterns in Pregnant Women Living in Highly Contaminated Areas: Data from the NEHO Birth Cohort

Silvia Ruggieri ¹, Gaspare Drago ^{1,*}, Simona Panunzi ², Giulia Rizzo ¹, Elisa Eleonora Tavormina ¹, Sabina Maltese ¹ and Fabio Cibella ¹



La coorte di nascita NEHO

Neonatal Environment and Health Outcomes



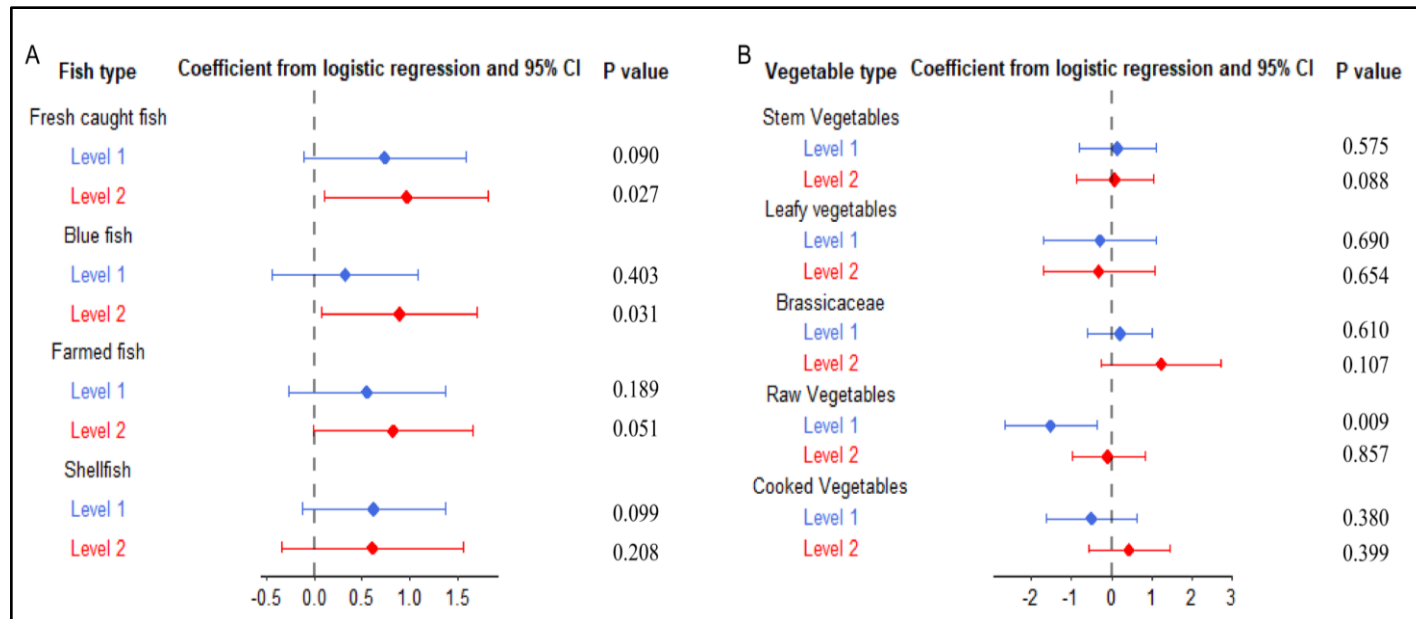
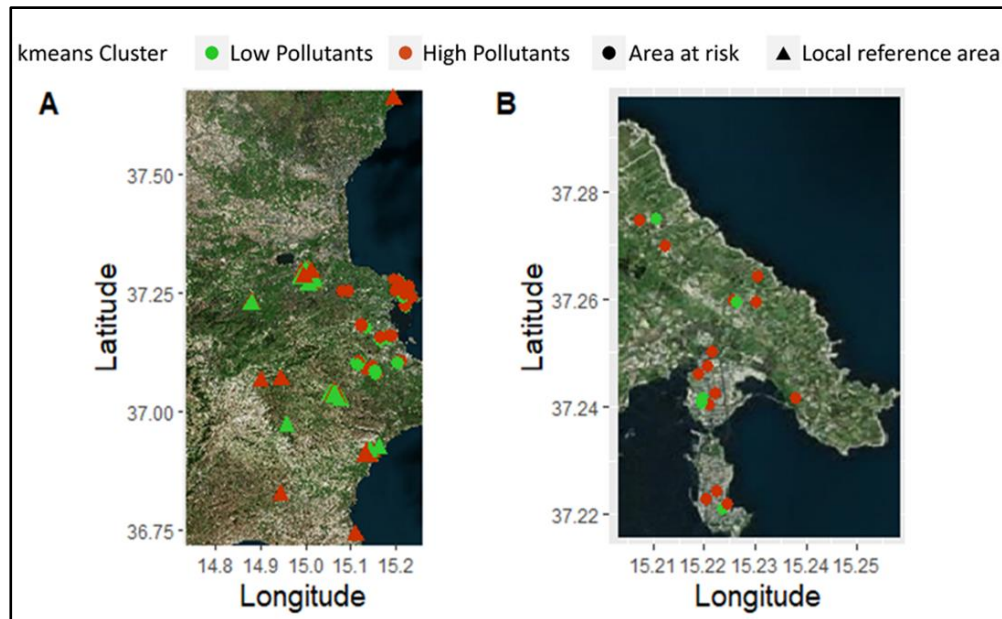
scientific reports

OPEN **Exposure profiles in pregnant women from a birth cohort in a highly contaminated area of southern Italy**

Check for updates



Gaspare Drago¹, Silvia Ruggieri^{1,2,3}, Mario Sprovieri², Giulia Rizzo⁴, Paolo Colombo⁴, Cristina Giosuè³, Enza Quinci⁴, Anna Traina³, Amalia Gastaldelli⁵, Fabio Cibella¹ & Simona Panunzi⁶



La coorte di nascita NEHO

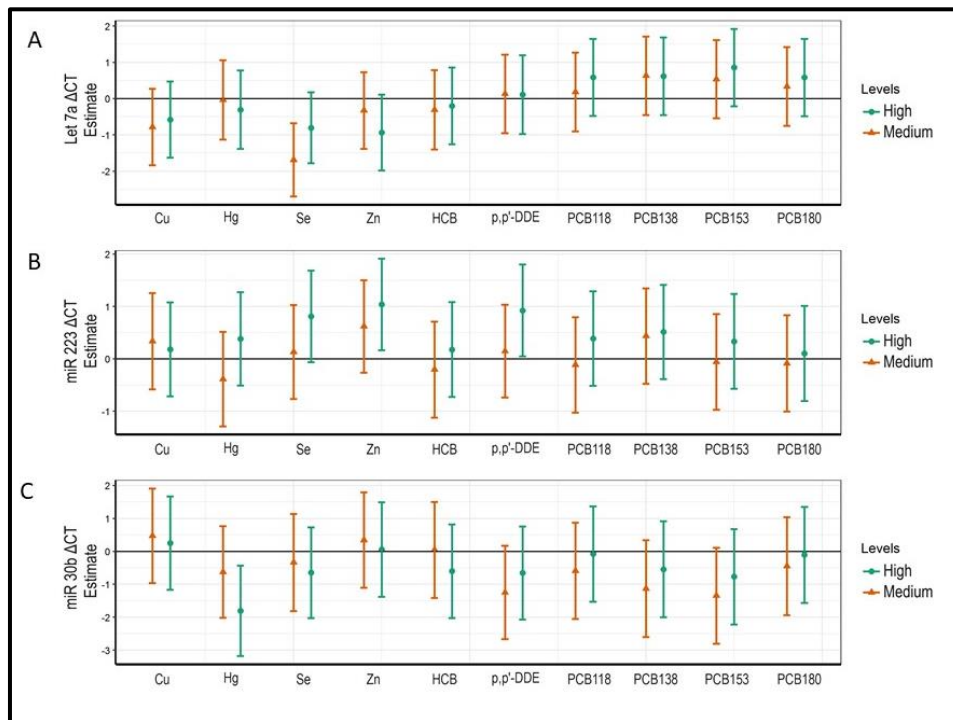
Neonatal Environment and Health Outcomes



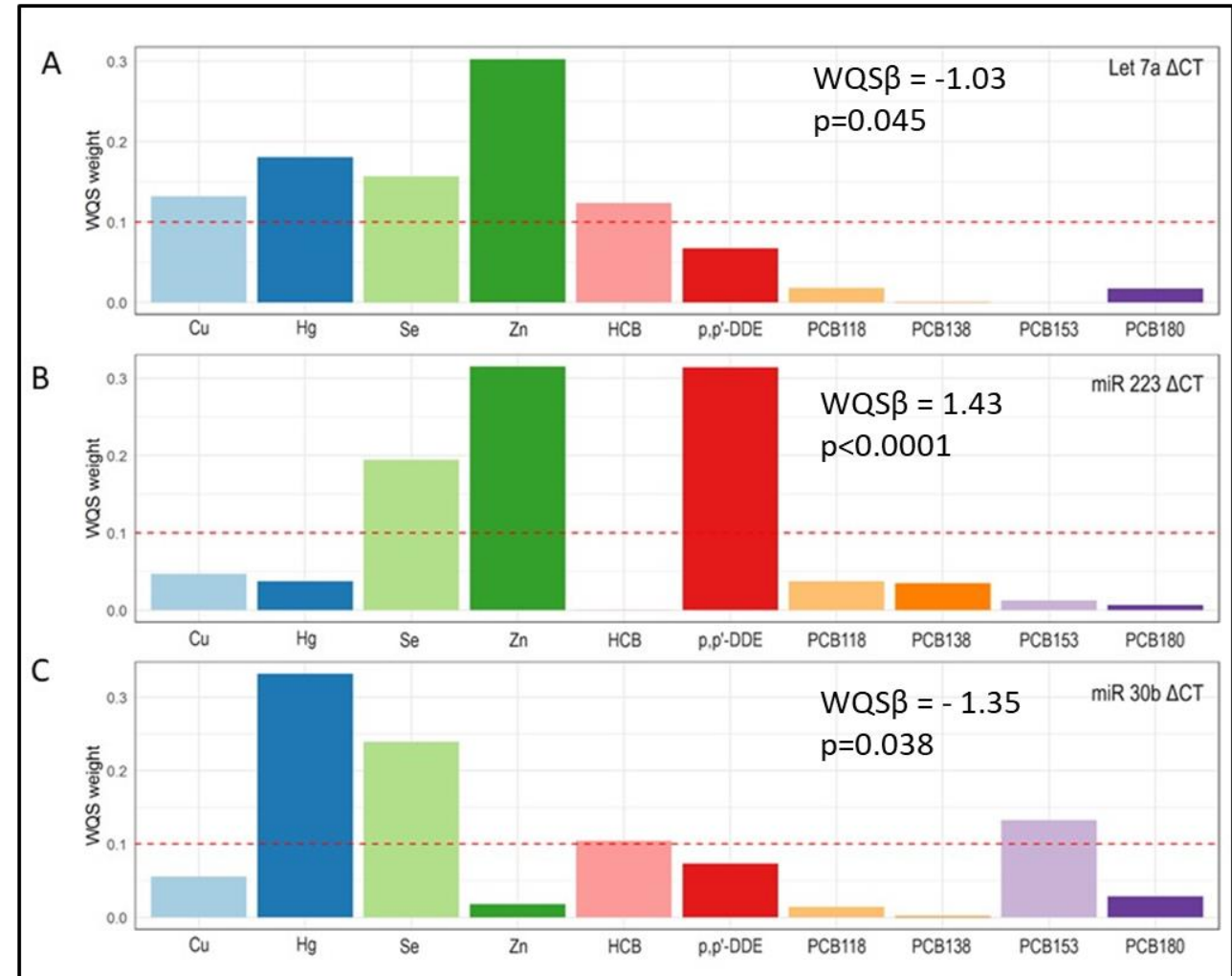
A multipollutant low-grade exposure regulates the expression of miR-30b, Let-7a and miR-223 in maternal sera: Evidence from the NEHO cohort

Valeria Longo ^{a,1}, Gaspare Drago ^{a,1}, Alessandra Longo ^a, Silvia Ruggieri ^a, Mario Sprovieri ^b, Fabio Cibella ^a, Paolo Colombo ^{a,*}

^a Institute for Biomedical Research and Innovation, National Research Council of Italy (IRIB-CNR), Via Ugo La Malfa 153, 90146 Palermo, Italy
^b Institute of Anthropogenic Impacts and Sustainability in Marine Environment, National Research Council of Italy (CNR-IAS), via del Mare 3, 91021 Torretta Granitola, Trapani, Italy



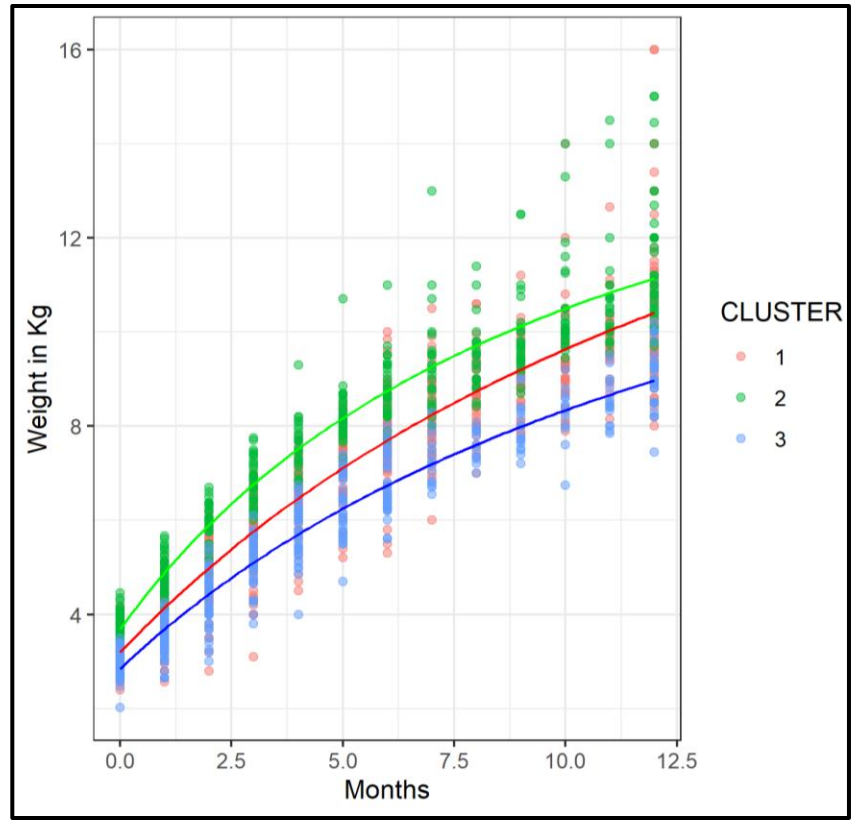
Weighted Quantile Sum Regression



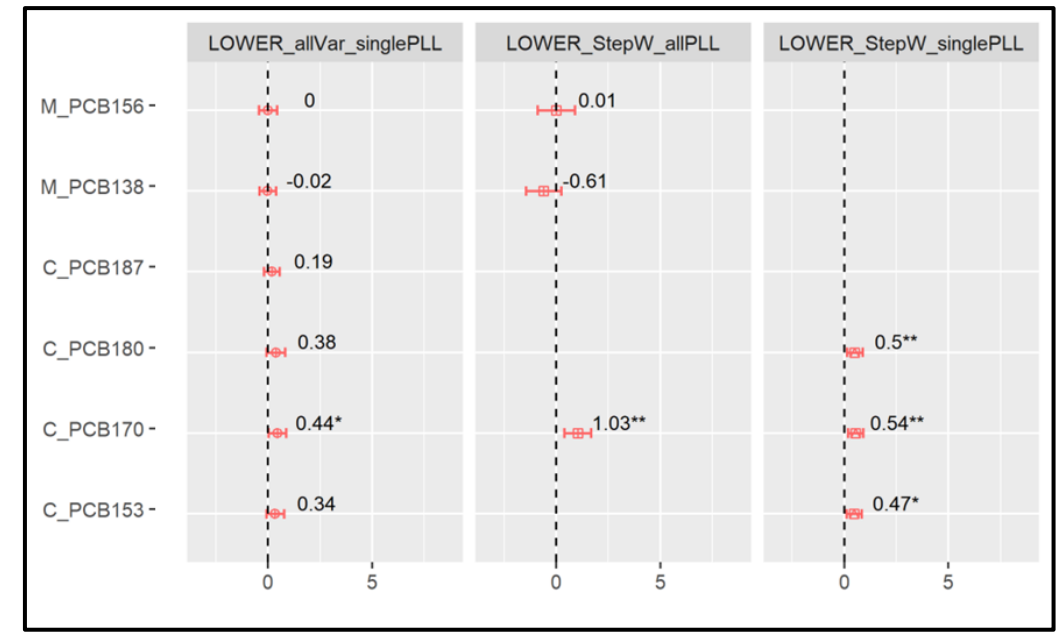
La coorte di nascita NEHO

Neonatal Environment and Health Outcomes

Group-based Multivariate Trajectory Model
Expectation-Maximization (EM).
Percentili di crescita - WHO standard growth



Time point	cluster 1	cluster 2	cluster 3	p-val
Birth	3282 (335)	3676 (272)	2972 (269)	<0.001
6M	7828 (870)	8783 (656)	6784 (635)	<0.001
12M	10475 (1468)	11314 (1386)	9005 (648)	<0.001



Fattori confondenti introdotti nei modelli: allattamento, BMI, fumo, alcol, settimana di gestazione, sesso, parità

Gruppo Epidemiologia ambientale



Silvia Ruggieri
Ric. TI III livello



Gaspare Drago
Ric. TI III livello



Melania Casella
Assegnista



Fabio Cibella
Dirigente di Ricerca

Elisa E. Tavormina
Ric. TD III livello



Ilaria Cosentini
Assegnista



Elisa M. Catania
Assegnista

