

THE EXPOSOME CONCEPT IN BIRTH COHORT RESEARCH: THE NEHO STUDY

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Background: Longitudinal birth cohorts provide the best design to determine the causal relationships between potential prenatal or postnatal risk factors as a whole – the exposome – and human health adopting the prospective approach of life-course epidemiology¹. NEHO cohort² is the only Italian cohort evaluating the exposome-human health relationships in highly contaminated areas.

Methods and Results: Between 2018-2020 NEHO cohort recruited 845 mother–child pairs resident in three highly polluted industrial areas in southern Italy. NEHO data collection allows the integration of all the potential exposures, including biomonitoring data, socioeconomic characteristics³, diet⁴ and any possible further external stressor. Several statistical methods have been used to select and analyze this large set of exposures⁵. Exposure data were supplemented with multi-omics approaches. NEHO is included in the Italian birth cohort network, funded within PNC “ECAR”, aimed at harmonize birth cohort data in order to identify exposure risk factors leading to disease across the lifecycle.

Conclusions and Significance: Birth cohorts studies in heavily contaminated areas represent a great opportunity for understanding the mechanisms underlying the relationship between environmental pressure and human health. Moreover, a better comprehension of the interaction among biological processes, social inequalities and health outcomes will provide more precise targets for policy interventions.

Keywords: Exposome, Birth cohorts, Life-course epidemiology, Omics, Socioeconomic Status

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