

**Priority Topic 12:** Early life exposure (Preconceptual through adolescence) leading to later life impacts (fetal to old age) - Prevention and Intervention

**Convener:** Goldman & Bearer

**Discussion Participants:**

**Subtopic Report Numbers from Days One and Two:**

Primary:

65 Early life exposures in childhood and adult disease: role of susceptibility factors

21 Human variability: sources and contribution to differential susceptibility to exposures to environmental agents

12 Early life exposures (periconceptual through adolescence) leading to later life impacts (child to old age)—prevention and intervention

+/-2

Research areas:

2 Identification of pre-, peri-, and post-natal environmental factors that contribute to variation in neurodevelopmental outcomes

10 Define translational research and its role in EHS

17 Regenerative approaches to correcting complex structural birth defects

18 Acquired DNA modification (both DNA sequence and epigenetic modifications) may provide an integrated dosimeter of environmental exposure and be a useful predictor of disease

24 Nutritional modulation of environmental insults (or interplay of nutrients with toxicants to modulate health and disease)

61 Basic research on mutagenic mechanisms using model systems

94 Toxicants as potential metabolic disruptors

Specific environments:

30 Traffic related air pollution and human disease

32 Indoor air quality

57 Healthy buildings and communities

76 Healthy environments for children: IEQ

Methodologies:

41 Partnering with communities

49 Children's environmental health research: networks and more bang for the buck

64 Protecting our investments by providing infrastructure and support to biorepositories, cohorts, and datasets to expand our ability to study new and emerging hypotheses

Overarching NIEHS goals:

22 Research translation/communication

66 Science based risk assessment

80 Preventing prenatal exposures to toxicants

91 The role of public health prevention in environmental health research

**Recommended Strategic Goal:**

***Understanding how early life environmental exposures impact development and health across the lifespan.***

**Potential Beneficiaries of this Strategic Goal:** Women of childbearing age, children, fathers

Broadly, economic benefits: for education, health care across the life span, taxpayers, the US economy

**NIEHS Capabilities and Partnerships Needed to Achieve this Goal:**

To achieve this strategic goal requires focus on understanding vulnerability, susceptibility, variation and implications for prevention and intervention.

Partnerships: Especially, people who have resources, research related to children: NICHD (NCS and other research networks), NHLBI, NCI, EPA, CDC, WHO, Other international networks, NGO's, industry. Potentially: many institutes of NIH (NIAAA, NIDDK, NIDA) and many other organizations.

Capabilities:

- Development and core facilities to measure Genetics, epigenetics, metabolomics, proteomics, exposome
- Develop tools and methods for basic mechanistic studies, exposure assessment, biorepositories, models of molecular/cellular/animal/virtual development,
- Develop core facilities which are open to the scientific community: for novel emerging technology, for data, biorepository, access to models, exposure assessment
- Develop interventions at multiple levels
- Tools for communication and intervention across disciplines
- Community based research and research networks