

# Strengthening the Evidence Base

## The New York Community Trust Funds Study of Mothers' Exposures & Children's Health

### ■ Seeking Evidence

Concerned about how toxic hazards affect people's health, the New York Community Trust decided to invest in research to strengthen the evidence base for public health intervention and advocacy. This led the Trust to support a major longitudinal study at Columbia University of pregnant women, their environmental exposures and impacts on their children.

For over 16 years, the Mothers and Newborns study has monitored the health of over 700 mothers and children living in Northern Manhattan and the South Bronx, from during the mothers' pregnancy through the children's birth, childhood and adolescence. Participants were recruited from neighborhoods bearing high burdens of poverty, pollution, and health concerns like asthma, low birth weight, and obesity. Foundation, federal and private funding supported the study and its community partners like West Harlem Environmental Action (WEACT).

### ■ Documenting Impacts

The study researchers documented many aspects of mothers' health during pregnancy, including diet, poverty-related stress, and prenatal exposures to indoor and outdoor pollutants (including traffic pollutants, pesticides, second-hand smoke, chemicals in plastics and consumer products, flame retardants, and pest allergens). Preliminary research had linked such prenatal exposures to delays in cognitive and behavioral development, respiratory problems, cancer risk, obesity and metabolic disorders, but human evidence was often lacking.

The study then evaluated mothers and babies at birth. Newborns prenatally exposed to various pollutants were found to have lower than average birth weights and head circumference, key indicators of developmental delay. Maternal urine tests during pregnancy found potentially harmful levels of chemicals in nearly every mother. Nearly 50% of newborns' cord blood samples had detectable levels of toxic air pollutants--polycyclic aromatic hydrocarbons (PAHs) -- bound to infants' DNA, indicating toxicants passed from mother to fetus during pregnancy.

The study has continued to document children's impacts through assessments every 6 months until age 3, and then every 2 years through adolescence, finding impacts like:

- **Respiratory problems:** Up to 21% of newborns experienced respiratory problems in the first year of life. At age five, 30% were diagnosed with asthma, and asthma risk at ages 5-6 was elevated in children exposed to airborne toxicants such as pyrene (a PAH) and black carbon.
- **Developmental problems:** Children most exposed to PAHs or household pesticides were more likely to suffer from attention or cognitive problems, asthma, or obesity. Forty percent of children exposed to secondhand smoke displayed developmental delays at age 2, compared to only 25% of unexposed children.

### ■ Intervention and Advocacy

While the New York study continues, its techniques are being applied elsewhere, like in a China study of health impacts of children living near a coal power plant. Documenting links between environmental exposures and children's health also has enabled researchers to initiate intervention and outreach to improve health outcomes. An intervention study during pregnancy showed that non-toxic pest control methods effectively decreased household cockroach infestations while reducing toxic insecticide levels in indoor air and mothers' blood.

Researchers and community partners have educated families, physicians, and patients about the need for preventive action, while providing study results to the public and to policy-makers responsible for environmental and public health protection.

The New York Community Trust also has helped connect study findings to advocates for reducing toxic exposures. U.S. campaigns to protect health from toxic chemicals have used study findings to strengthen the public health case for regulation of chemicals, helping to fulfill NYCT's goal of supporting research to inform advocacy to improve health.