

**ISEE-185****DON'T UNDERVALUE ENVIRONMENTAL DAMAGE: TOWARDS A FULLER COSTING OF BIRTH DEFECTS**

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**Abstract:** Federal governments considering potential regulatory actions compare the estimated costs and benefits of alternative potential actions. Appropriate decisions can be made only if both costs and benefits are accurately and completely assessed. Unfortunately, the quantification of benefits is severely limited by the state of current methods, data and knowledge. Consequently, incomplete analyses are done, and the appropriate comparison of costs and benefits is impossible.

For valuing children's health effects in particular, additional complications arise. For instance, because classical economic benefit analysis uses a human capital approach, i.e., 'time lost' to persons due to adverse health is valued based on the current wage rates (productivity losses), the children's time losses are valued at zero. And because cost-of-illness studies only include the lost time of individuals suffering illness, the time lost to children's caretakers is also omitted.

Other omissions exacerbate the underestimation. For instance, many birth defects are associated with an increased risk of physiologically related (but etiologically unrelated) conditions, such as increased ear infection rates among children with cleft lips or palates. These events tend to be underestimated in cost-of-illness studies. Another omission is the disproportionate academic underachievement of children with birth defects, compared to siblings and other control groups.

This effort seeks to fill in some of the gaps related to the monetization of one class of birth defects associated with numerous environmental exposures: cleft lip and/or palate.

**ISEE-186****CHILDREN'S BLOOD LEAD STUDY AFTER REDUCTION OF LEADED FUEL USE IN BOMBAY, INDIA**

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**Abstract:** The objective of this study was to test for reduction in pediatric blood lead levels (BLLs) in Bombay, India by comparing BLLs collected in 2002 (after use of leaded gasoline was phased out in Bombay) to those collected in study conducted by the George Foundation in 1998 (when leaded gasoline was still used in Mumbai). We analyzed BLL in a total of 754 children under age 12 in two separate sampling campaigns (276 from Jan 2002 to Dec 2003 [non-monsoon season]; 478 in Jun to Aug 2003 [monsoon season]). BLL was measured using an ESA Lead Care Portable Analyzer. We also measured lead in PM10 samples collected in the study region. These data were compared with a study done by the George Foundation in 1997 before the phase out of leaded gasoline. The George Foundation study reported that 62% of the 291 children tested in Bombay had elevated blood lead levels (BLL > 10 ug/dL). In the present study, 33% of the 754 tested children had elevated blood lead levels. The average BLL for the full study population (Geo Mean = 8.36 ug/dL, SE = 0.19 ug/dL) was lower than the CDC level of concern (10 ug/dL), with one child diagnosed with lead poisoning (BLL > 65 ug/dL). A seasonal periodicity of BLLs was found, with BLL in monsoon season (Geo Mean = 9.05 ug/dL, SE = 0.26 ug/dL) higher than that in the non-monsoon season (Geo Mean = 7.29 ug/dL, SE = 0.24 ug/dL). A seasonal periodicity of lead in PM10 was also found, with lead in monsoon season (Avg = 0.04 ug/m<sup>3</sup>, SE = 0.007 ug/m<sup>3</sup>) higher than that in the non-monsoon season (Avg = 0.43 ug/m<sup>3</sup>, SE = 0.1 ug/m<sup>3</sup>). These results demonstrate a significant success of the public health system

in Bombay, India - achieved by the removal of lead from gasoline. The emphasis should shift in the study region towards sources of lead exposure other than leaded gasoline (lead in paints, lead in Herbal medicines and lead in Kohl).

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**ISEE-187****HEALTH EFFECTS OF ENVIRONMENTAL EXPOSURES TO CHILDREN LIVING IN AN AGRICULTURAL COMMUNITY**

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**Introduction:** The Center for Children's Environmental Health Research at the University of California, Berkeley is one of eleven centers funded by the Environmental Protection Agency and National Institute of Environmental Health Sciences to investigate children's health and the environment. The goal of our center is to determine whether there are adverse health consequences to children from exposures to environmental hazards, including pesticides, pollens, molds, and dusts, in agricultural communities. Specifically, we will determine the relationship between neurodevelopment, growth, and the occurrence of asthma and chronic low-level pesticide exposure during the prenatal and postnatal periods.

**Methods:** Over one-year, we enrolled a cohort of 600 pregnant women who were receiving care from two community clinics who serve low-income, Hispanic residents of Monterey County, California; we have followed their children until age two and are currently completing assessments at age 42-months. Mothers have been interviewed pre- and post-natally about their habits, demographic characteristics, and work and medical histories. We conducted child neurobehavioral evaluations at 6, 12, and 24 months, focusing on behaviors likely to be affected by pesticide exposure. The mother has been questioned about her child's development and illnesses, breastfeeding, and child-care. Maternal and child urine, blood, breastmilk, dust, pollen, and mold samples have been collected, and home visits have been conducted.

**Results:** Data presented will describe environmental and sociodemographic factors potentially affecting the children's health and development, including housing quality and density, allergen exposures, environmental exposures (i.e., pesticides, ETS), SES, social support, and acculturation.

**Discussion:** This study will, for the first-time, provide comprehensive information on the sources, pathways, and levels of pesticide exposures of children. Similarly, it will provide new information on the potential adverse health effects of those exposures.

**ISEE-188****PROTECTIVE EFFECTS OF VITAMIN C AGAINST OXIDATIVE STRESS ON BIRTH WEIGHT**

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**Objectives:** Oxidative stress on pregnant women plays an important role in low birth weight. Vitamin C plays major role in providing the antioxidant defense against oxygen free radicals. This vitamin is transported to the fetus in the second and third trimester of pregnancy.

This study aims to evaluate the protective effect of vitamin C against adverse effect of oxidative stress on birth weight.

**Methods:** Pregnant women, who visited Ewha Womans University Hospital for prenatal care, participated in this study from their 24th to 28th gestational weeks. We included 318 healthy singleton pregnant women and surveyed for general characteristics. We measured the urinary levels of two oxidative injury biomarkers, the oxidative DNA adduct (8-OH-dG) and the lipid peroxidation product (MDA), and the serum level of one oxidative marker, homocysteine, in the second trimester of pregnancy. We followed birth outcomes (gestational age, birth weight, and baby sex) after delivery of their babies by review of medical chart.

**Results:** Adjusted birth weights were decreased with increased oxidative stress levels. Adjusted birth weights from mothers with lower level of 8-OHdG and MDA were higher than infant's birth weight from others (3338g vs. 3227g for 8-OH-dG and 3415g vs. 3227g for MDA). Adjusted birth weights from mothers with higher level of vitamin C (>75 percentile) was higher than infants from others (3378g vs. 3281g). Using multiple regression model, level of 8-OH-dG was significantly associated with decrease of birth weight in mothers with low level of vitamin C. However, in mothers with high level of vitamin C, level of 8-OH-dG was not associated with decrease of birth weight in mothers.

**Conclusions:** Prenatal vitamin C might play a role in providing the antioxidant defense against oxygen free radicals to birth weight.

This study was supported by a grant from the Korea Health 21 R & D project, Ministry of Health and Welfare, Kwacheon, Kyunggi, Republic of Korea (no. HMP-01-PJ1-PG1-01CH15-0009 and HMP-03-PJ1-PG10-21900-0001).

#### ISEE-189

##### BURNS TO CHILDREN IN WOOD FUEL USING HOMES IN RURAL GUATEMALA

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**Introduction:** Several reports have described the risk of burns to children from open wood fires in poor countries, but there is little information available on community incidence and none describing the impact of preventative interventions. A randomised controlled trial currently underway in Guatemala designed to assess impacts of an improved stove on pneumonia and other health outcomes provides an opportunity to study this issue.

**Methods:** The study sample includes 507 homes using an open fire, recruited from a rural area of western Guatemala. Eligible homes had a child under 4 months or a pregnant woman (providing the index children for respiratory illness outcomes). Health surveillance for the index child is by weekly home visits until 18 months of age, with episodes of burns/scalds recorded. Household interview includes questions on burns/scalds in older siblings of the index child, repeated 6 monthly. Homes were randomly allocated to receive a *plancha* chimney wood stove immediately, or when the index child reaches 18 months.

**Results:** Index children being very young and closely supervised initially had a very low rate of burns/scalds. Preliminary analysis of 34 cases in these children after 11 months of follow-up showed similar numbers of burns in *plancha* and control groups (although due to OF in 2 *plancha* homes), with a trend towards burns in open fire homes being in older children (9.7 vs 7.1 months,  $p=0.1$ ). Among 1040 siblings aged up to 8 years in study homes, 22 reported a burn/scald in the 6 months prior to baseline (42 per 1,000 per year), all under 6 years. Eight resulted from falling into the fire, eight from scalds, and six from a hot object, pot or other cause. Fifteen left scars, seven larger than 2 cm diameter, one 3x14

cm. A further 40 episodes were recalled as having occurred prior to the last 6 months with similar causes, five leaving scars at least 5 cm in diameter.

**Discussion:** An improved stove has the potential to prevent the majority of burns/scalds, particularly the most severe episodes resulting from falling into an open fire. Initial findings indicate that burns still occur with the *plancha*, but this could be in part lack of experience with young children near an unfamiliar, new type of stove, and a clearer picture may emerge as they get older. This study will provide information on incidence, severity and causes, and evidence on intervention effectiveness over 18 months in children up to around 10 years. Education in the safe use of improved stoves may well be required, as is the case for home accident prevention in any society.

#### ISEE-190

##### PRENATAL SERUM ANTI-OXIDATIVE VITAMIN LEVELS AND POSTNATAL GROWTH

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**Objectives:** Vitamin deficiency during pregnancy increases maternal oxidative stress and leads to adverse pregnancy outcome. These adverse effects might be continued through postnatal period. This study aims to determine the effect of prenatal antioxidative vitamin levels on postnatal growth using prospective study.

**Methods:** The subjects were 360 infants who were delivered from healthy pregnant women visited an obstetric clinic for antenatal care and their singleton live births, in Seoul, Korea, between August 2001 and March 2003. We measured the levels of vitamins A, C, E, and folate in maternal serum during the period 24–28 gestational weeks. We followed 106 infants' postnatal growths (6 months, 12 months, 18 months, and 24 months) among 380 infants using mail and telephone.

**Results:** Preliminary results for association between prenatal vitamin levels and 6 months postnatal growth vitamin A levels of prenatal maternal serum strongly correlated with vitamin A levels of cord blood ( $r=0.8$ ,  $p=0.008$ ). However, correlations for other prenatal vitamin levels else than vitamin A with vitamin levels of cord blood were weak. Mean body weights of infants were 3217.0g at birth and 8198.4g at 6 months. Compared with infants from mothers with vitamin C levels above 75 percentiles, mean body weight on 6 months infants from mothers with vitamin C levels below 75 percentiles was lower (8538g vs. 8033g,  $p=0.05$ ). Body weight percentiles were similar trend as well as body weights (3.8 vs. 3.3). Although significant difference was not shown, mean body weight on 6 months infants from mothers with low level of prenatal folate was lower than infants from mothers above 75 percentile prenatal folate levels (8466g vs. 7900). Body weight percentiles were also similar trend as well as body weights (3.8 vs. 3.0). Regarding vitamin A and E, body weights on 6 months were not different by prenatal vitamin levels.

**Conclusions:** Prenatal antioxidative vitamin C and folate levels might affect postnatal growth.

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#### ISEE-191

##### URINARY LEVELS OF DI-2-ETHYLHEXYL PHTHALATE METABOLITES IN NICU INFANTS

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**Rationale:** Di-2-ethylhexyl phthalate is commonly used as a plasticizer in multiple medical products containing poly vinyl chloride and may represent between 20–40% of the finished weight of the plastic. Medical devices containing DEHP are in extensive use in modern NICU's. The lipophilic nature of DEHP and its non-covalent binding to PVC allow it to leach from products being used. This is of concern, since in developing and adult laboratory animals, the metabolites have demonstrated multiple organ system toxicities, most notably hepatic and reproductive. We performed a cross-sectional study to assess the relationship of exposure to DEHP containing medical devices with internalized dose of DEHP in neonates as reflected by levels of MEHP (mono ethylhexyl phthalate) a principal urinary metabolite of DEHP.

**Methods:** The study sample comprised (54) randomly selected infants enrolled nearly evenly from two Level III Boston hospital nurseries during the time period March 1– April 30, 2003. Subjects were in the NICU at least 3 days before observation, and had a corrected gestational age of  $\leq$  44 weeks. LOW, MEDIUM, and HIGH DEHP exposure classification categories were determined apriori, with the LOW exposure group containing subjects receiving primarily bottle and/or gavage feedings; the MEDIUM exposure group receiving enteral feedings, intravenous hyperalimentation, and/or nasal continuous positive airway pressure (CPAP); and the HIGH exposure group receiving umbilical vessel catheterization, endotracheal intubation, intravenous hyperalimentation and an indwelling gavage tube. Neonatal urine samples were collected from each infant using a standardized protocol and measured for MEHP by liquid chromatography (HPLC) and tandem mass spectroscopy (MS/MS).

**Results:** MEHP levels tended to be greater among male infants and among infants with lower gestational age and longer stays in the NICU. MEHP levels were substantially higher with increasing exposure class: for the LOW, MEDIUM, and HIGH exposure classes, mean (sd) MEHP levels were, in ng/mL, 9.3 (9.8), 41 (55), and 139 (189), respectively ( $p=0.004$ , ANOVA of log-transformed values). Although further adjustment for institution and infant's sex attenuated these differences somewhat ( $p=0.09$ ), infants in the HIGH exposure class still demonstrated significantly higher MEHP levels than infants in the LOW exposure class ( $p=0.03$ ).

**Conclusion:** Use of DEHP-containing medical devices leads to demonstrable urinary levels of metabolites in NICU infants.

#### ISEE-192

##### RELATIONSHIP BETWEEN PRENATAL ENVIRONMENTAL EXPOSURES, BIRTH OUTCOMES AND COGNITIVE DEVELOPMENT IN AN URBAN MINORITY COHORT

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**Introduction:** The Columbia Center for Children's Environmental Health is evaluating effects of environmental exposures during pregnancy on fetal growth and infant neurocognitive development in a cohort of African American and Dominican mothers and infants in NYC. Exposures include polycyclic aromatic hydrocarbons (PAH), environmental tobacco smoke (ETS), and pesticides.

**Methods:** Data sources include personal air monitoring of the mother during pregnancy, detailed questionnaires and laboratory analyses of

biomarkers in blood samples collected from the mothers and newborns at delivery. Over 550 pregnant nonsmoking women have been enrolled and their infants are being followed prospectively through school age.

**Results:** High prenatal exposure to PAH as estimated by personal air monitoring is associated with lower birth weight ( $p=0.003$ ) and smaller head circumference ( $p<0.01$ ) among African American newborns, after adjusting for potential confounders. Among both African Americans and Dominicans, ETS was associated with decreased head circumference at birth ( $p=0.04$ ); and there was a significant interaction between prenatal exposure to ETS and PAH-DNA adducts in cord blood such that the combined exposure to high ETS and high adducts had a significant effect on birth weight ( $p=0.04$ ) and head circumference ( $p=0.01$ ) after adjusting for potential confounders. ETS exposure and material hardship during pregnancy were significantly inversely associated with infant cognitive development at two years ( $p<0.05$ ), controlling for confounders, and there was an interaction effect such that infants with both exposures had a 7-point decrement in cognitive scores at 24 months of age. Compared to non-exposed children, those with prenatal ETS exposure were twice as likely to be classified as significantly delayed. Finally, levels of the insecticide chlorpyrifos in umbilical cord blood samples were inversely associated with birth weight and length ( $p<0.05$ ), controlling for potential confounders. Combined measures of the insecticides chlorpyrifos and diazinon were also inversely associated with birth weight and length ( $p<0.03$ ). The associations between birth weight/length and cord plasma chlorpyrifos and diazinon were highly significant ( $p<0.007$ ) among newborns born prior to the 2000–2001 U.S. EPA's regulatory actions to phase out residential use of these insecticides, but not among newborns born after 1/1/01 ( $p>0.8$ ).

**Discussion:** These results indicate that interactions between toxicants as well as between toxicants and socioeconomic stressors during pregnancy impair fetal growth and/or child cognitive development in this minority cohort. These results support recent regulatory action to phase out residential uses of chlorpyrifos and diazinon and indicate the need for further measures to reduce ETS and PAH exposures.

#### ISEE-193

##### METAL MIXTURES AND CHILDREN'S HEALTH

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**Abstract:** The Harvard Center for Children's Environmental Health and Disease Prevention Research is a newly-established effort designed to address the concerns of a community living in the Tar Creek Superfund site of Oklahoma—an area highly contaminated by metals (lead, cadmium, iron, manganese, and others) in mining waste populated by many residents of Native American descent. Our goal is to take an innovative and integrated approach to addressing a “real world” problem, i.e., the potential of the mixtures of metals that are present in the “chat” (mining waste) to interact with each other in terms of exposure, absorption, dose, and adverse effects on the development of children.

The three Research Projects of our Center include a community-based participatory epidemiologic study that examines biological markers of fetal and early childhood exposures to metals (lead, manganese, cadmium, and iron), their impact on measures of mental development, and their response to a quasi-experimental randomized trial of nutritional and behavioral interventions. Project 2 will assess the utility of size fractionation and sequential extraction studies for characterizing chat and conduct a nested case-control study of the determinants of high vs. low burdens of metals amongst children participating in Project 1. Project 3 will seek to identify the most important routes of exposure. Is it food,

water, air, or hand to mouth contamination? It will also investigate the expression of binding and transporter molecules for metal transport and the corresponding pharmacokinetics of metals from the lung and gut to the blood, CNS and other organs as they relate to pregnant rats and their weanlings. All three projects will be supported by our Administrative, Analytical Chemistry, and Biostatistics Cores.

Our Community Outreach and Translation Core will utilize an innovative portfolio of outreach activities to develop awareness and influence behaviors and thus prevent adverse health effects in children from exposure to metals in mining waste.

In this presentation, the Center PI will briefly outline the history of this program's development, summarize the specific aims of the program's projects, and briefly review of preliminary studies. In particular, we have data on mother-newborn biomarkers of lead and manganese burden, GIS modeling of biomarker levels in relation to mining "chat" piles, and a series of experiments on the role played by metal transporters--- particularly, DMT1 (divalent metal transporter 1)--- on manganese and iron homeostasis.

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#### ISEE-194

#### CLANDESTINE METHAMPHETAMINE LABS: RISKS TO CHILDREN

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**Abstract:** This describes a rapidly growing health hazard for children. With little epidemiologic data to rely on, estimates of the risk to children must rely upon law enforcement reports of seized labs.

Clandestine methamphetamine manufacturing laboratories pose health risks to adults doing the 'cooking': police, firefighters or other responders who enter the lab for law enforcement or clean up purposes, and to children and other persons who may be residing in or visiting the places where labs exist. Health risks result from exposure to hazardous chemical ingredients, the methamphetamine production process, and exposure to the drug product itself. Adult victims suffer serious burns, trauma from explosions or violent behavior, acute and chronic respiratory dysfunction, and death, without including the effects of addiction to the drug itself. Children who happen to be residing in or near meth labs are subject to these risks and more, including abuse, neglect, and inadvertent exposure to methamphetamine. Children exposed to methamphetamine in utero can suffer cardiac and brain lesions. The epidemiology is rudimentary. The number of children actually exposed is nearly impossible to estimate, as is the number of clandestine labs in existence. Of 291 children removed from meth labs between 2001–2003, 117 were considered by emergency responders to be 'chemically' exposed. Other estimates of the numbers of children exposed based on urine samples indicate that >1/3 of the children removed from labs are exposed to methamphetamine. Prevention efforts are focused on ways to care for children after they have been removed from a lab environment. Many jurisdictions are developing protocols for care of 'Drug Endangered Children'. Appropriate care and follow-up of these children consists of identifying damage that has been done, preventing further exposure as well as trauma, ameliorating psychological damage, and long term evaluation to identify and work with developmental problems that emerge. Still, it is difficult to mobilize prevention and treatment efforts without good estimates of the extent of the problem. We describe the existing data and ask for innovative epidemiologic approaches to quantifying the problem.

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#### ISEE-195

#### RELIABILITY OF HEALTH DATA COLLECTED BY MEANS OF SELF-ADMINISTERED QUESTIONNAIRE

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**Abstract:** To assess the role air pollution plays in the development of some respiratory symptoms in children a cross-sectional study was performed in 14 areas of 9 Russian cities in 1998–1999. Health information from nearly 6000 schoolchildren, aged 7–13, was collected by means of self-administered questionnaire filled in by parents.

Since this study was the first study of its type conducted in Russia, we were interested in the reliability of the collected health data. Epidemiologic studies traditionally conducted in Russia to assess adverse health effects of ambient air pollution had been based upon morbidity statistics and/or information taken directly from medical records of children combined with air monitoring data from central sites. We designed a cross-sectional study in which a questionnaire was administered simultaneously in a number of territories characterized with different pollution levels. Along with administering the questionnaire, ambient air pollution was intensively monitored following in all areas under study using the same QA/QC procedures. We carried out repeatability analysis to assess the reliability of the data collected in this manner. We found substantial to excellent agreement (Cohen's kappa range 0.7–1). We studied some issues of over-reporting and found that number of symptoms reported depended on whom filled out the questionnaire: women reported more symptoms than men. We found under-reporting of individual risk factors also depended on whom filled out the questionnaire. For example if the mother filled out the questionnaire, she would be less likely to report smoking during pregnancy then if another person filled out the questionnaire. The number of respiratory symptoms reported was correlated with the number of non-respiratory symptoms and illnesses.

We compared area-level prevalences of health outcomes with available year-average prevalences of the same health outcomes from local public health authorities for the same time period. Despite the observed over- and under-reporting, the questionnaire-based prevalences of health outcomes were highly correlated with public health data.

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#### ISEE-196

#### THE PREGNANCY ENVIRONMENT AND CHILD HEALTH (PEACH) STUDY OF INTRAUTERINE AND POSTNATAL EXPOSURE TO HALOGENATED COMPOUNDS AND CHILDHOOD ATOPY

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**Abstract:** Despite many years of intense research, the etiology of allergic (atopic) disorders (asthma, eczema, and hay fever) remains poorly understood. The role of intrauterine priming is in dispute, in particular, whether endocrine disrupting chemicals (EDCs) alter fetal immune responses. The Pregnancy Environment And Child Health (PEACH) Study is using time-sensitive measurements in a period of rapid changes integrated into a complex design. By enrolling primiparae and measuring their serum EDC concentration in the first trimester of pregnancy, we establish unbiased measures of exposure. At delivery, placental samples are used to determine fetal EDCs. Cord blood samples are collected to determine the neonatal cytokine response of mononuclear cells. Life style and diet during pregnancy, as well as perinatal events are ascertained by interviews and medical records. At two week postnatally, we collect

breast milk samples to determine EDCs, cytokines and immunoglobulins. Information from pediatric charts and interviews at 6 and 12 months postnatally is used to establish atopic manifestations in the offspring. Pregnancy and infancy is marked by a series of rapid endocrine and immunologic changes. Each step is dependent on the prior, hence, we need a design that facilitates the analyses of a cascade of events. Regarding exposure, we will assess the extent to which maternal concentration of EDCs such as organochlorines predicts placental and breast milk concentrations. Regarding immune response, we will estimate the association between maternal and placental EDCs and cord blood (fetal) immune markers. The immunologic benefits of breast milk and the increased risk due to organochlorine have long been debated. PEACH will allow us to disentangle the protective from the potentially harmful properties. Finally, we will assess the impact of maternal and early childhood predictors on the development of atopic disorders in infancy. Such a holistic approach is attainable due to improved technique to quantify both exposure and outcome using specific and time-sensitive markers. We believe that this holistic approach will help to overcome the scientific uncertainties produced by fragmented studies focusing on exposure-outcome relationships at single points in time. Initial results and interpretations of our preliminary data will be presented. In the future, the PEACH study will include further follow-up of this cohort to characterize gene-environment interactions.

This project is supported by grants from the United States Environmental Protection Agency, STAR grant number R830825-01-0, the Michigan Great Lakes Protection Fund, the Agency for Toxic Substances and Disease Registry (ATSDR) and The Gerber Foundation.

#### ISEE-197

##### FOOD ALLERGY IN THE POPULATION OF SCHOOL CHILDREN IN POLAND

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**Introduction:** The true prevalence of food allergy in children living in Poland is generally thought to be low. In contrast to respiratory allergies, epidemiology of food allergy (FA) has been little studied. The aim of our study was to investigate the prevalence of FA and its relationships to other allergic diseases among school children living in Silesian voivodeship – the most industrialised part of Poland. In 2001 (grant from the Polish Scientific Research Committee KBN 4P05D 08619) we carried out a cross-sectional health survey on children 6–7 years old and children 13–14 years old living in the city.

**Methods:** Using the ISAAC (International Study of Asthma and Allergies in Childhood) and CESAR (Central European Study on Air Pollution and Respiratory Health) questionnaire we invited for the study all 2500 candidate children. Completed questionnaire was returned by parents of 2000 children (response rate 80%). For statistical analysis computer program STATA 8.0 was employed. Prevalence rates were calculated and chi square tests were used to compare the rates between groups. P values < 0.05 was regarded as statistically significant.

**Results:** Replies to the questionnaire were received from 519 children 6–7 years old and 1481 children 13–14 years old. The prevalence of FA and other allergic diseases (in %) are shown below.

	6–7 yrs	13–14yrs
FA	17.1	7.3
Atopic dermatitis	19.3	11.9
Pollen allergy	10.3	10.8

	6–7 yrs	13–14yrs
Pets allergy	8.8	8.6
Dust allergy	9.5	8.2
Asthma	5.0	3.6

**Conclusions:** Our study suggested that the prevalence of FA and atopic dermatitis was a significantly higher in 6–7 years old group of children. Prevalences of FA were more often reported among children with asthma (9.8%), dust allergy (27.3%), pets allergy (26.5%), pollen allergy (29.5%), atopic dermatitis (45.3%).

Polish Scientific Research Committee (KBN 4P05D 08619) and Prof. Zejda, Silesian Medical Academy Katowice, Poland.

#### ISEE-198

##### RISK FACTORS FOR PHYSICAL AND PSYCHOLOGICAL DEVELOPMENT OF SCHOOL CHILDREN

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**Introduction:** Healthy development of school children requires an optimal psycho-sensory and static load at school and outside school, physical activity and rest. The tendency of increasing risk factors in living and working conditions and behaviour of school children can impact their morbidity. The aim is a comparative study in fifteen-year interval.

**Methods:** All daily activities in representative samples of school children in 1998 (1091 boys, 1248 girls) and in 1982 (1154 boys, 1054 girls) were assessed by 7-day records. Data were analysed according age and sex. Prevalence of chronic diseases in schoolchildren was obtained in cross-sectional studies on the basis of questionnaire in 1689 boys and 1748 girls in the year 2000 and in 47517 boys and 46022 girls in the year 1986 in all age groups from all regions of Slovakia. The programme Epi-Info 6 and S-Plus were used for statistical analysis.

**Results:** In 2000 younger school children had significantly more optional and private lessons and other educational activities than in 1982. The age differentiation has not been respected in school load. Psychosensoric work was higher in girls. Physical and sport activity has increased, but has not reached recommended level, particularly in girls. A significant increase of daily television watching and a significant decrease of sleep time have been shown in each grade (P<0.001). Health risks in daily regimen have been increased in school children. Psycho-sensory and static strain is excessive in many younger pupils, significantly higher in comparison with those in 1982.

The frequency of chronic diseases has shown the increase of chronic diseases after 15 years - of impaired vision (1986 vs. 2000: boys 13.7 vs. 15.2%; girls 16.1 vs. 19.1%, P<0.001), orthopedic disorders particularly backbone disorders (boys 11.8 vs.14.6%, P<0.001; girls 11.5 vs. 14.1%, P<0.001) and psychological disorders (boys 2.1 vs. 4.1%, P<0.001; girls 1.5 vs. 3.8%, P<0.001). Comparing boys and girls the frequency of impaired vision has been confirmed significantly higher in girls in both surveys.

**Conclusion:** Negative morbidity trend in Slovak school children could be a consequence of psycho-sensory and static load rising during education and free time and on the contrary of inappropriate low physical and sport activities. The physical, mental and emotional health protection and promotion of school children needs to revise intervention procedure.

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